W A Handbook of Medical Jurisice and Toxicology (R) 46
A, Dietetics for Clinician (R) 12
disease see Kidney
Association (A) 392
Dental Students Association 180
Empire Cancer Campaign inquiry, (A) 389
Homœopathic Association, 371
Hospitals Association 731
Institute of Philosophy, 92
Planning Commission, see Health ces
Pharmaceutical Conference, 734
Pharmacopœia—737, 744, addento 518 518 (A) 639 737, supplement to BPC, 318, (A) 481, see also Drugs
British Postgraduate Medical School 724
British Social Hygiene Council—482 social biology conference 696, transfer of educational work 462 482
Britain H A Architectural Principles in Arthrodesis (A) 742
Brockbank E M, Epithelioma of Skin in Cotton Spinners (A) 17
Brocklank, W, dyspeptic soldier, 39
Broman A Simple Health Hints (A) 114
Bromberg Y M, autodetoxication of stilbœstrol 381
Bronchi see Air-passages Lung and Respiratory
bronchopneumonia see Pneumonia
Brown A F (O) 126
Brown F W heredity of psychoneuroses (A) 690 (C) 721
Brown K P on acute intestinal obstruction, 279
Brown L Story of Clinical Pulmonary Tuberculosis (R) 78
Brown L T Goldthwait, J E Swaim L T, Kuhns J G, and Kerr W J, Body Mechanics (R) 592
Brown R K (O) 665
Brumlow C V Gould's Medical Dictionary (P) 294
Brucella abortus see Abortion, contagious
Budget the (P) 516
Bugs see Bed bug
Building see Cities Housing and Planning
Bull H C H dyspeptic soldier (C) 185
Bullock K, drying plasma and serum 281
Bullough W S, on foot and mouth disease (A) 596
Bunyan J Bunyan Stannard envelope (C) 750
Bunyan Stannard envelope see Burns
Burge H W, on regional anæsthesia, 77
Burial see Legal medicine
Burnet J liquid paraffin (C) 693
Burns—anæsthetist's negligence and (A) 670 antiseptic emulsions in (Heggie, Gerard Heggie Bradbury, Morrison and Stout) 347, (Coutts) (C) 461, (Heggie Heggie and Bradbury) (C) 547 Bunyan Stannard envelope and (LA) 8, (Bunyan) (C) 750, chemical coagulants in (Medawar) 350, (LA) 505, chemotherapy of 337 (Francis) 408, (LA) 418 505 (A) 566 596 (LA) 709, (A) 769 diffusion of gentian violet (Lum) 585, EMS memo on (A) 688 (LA) 709 eucerine and albucid ointment in 337, fibrin membranes in, 754 late end results of (Wakeley) 410 acid and 410, (Levitt and Gillies) 4 (LA) 505 masseur's alleged negligence and (ML) 570 pathology of (A) 688 (LA) 709, plasma in on hospital ship (Wolfe and Clegg) 191 (LA) 505 progress in treatment (LA) 505 (Wakeley) (C) 575, research on treatment (A) 769 see also Cross infection, Grafts Injuries, Poison gas, Shock, and Transfusion
Burrow, H future of medical research (C) 5 on growth and new growth 323
Burt H, on occupational therapy in arthritis (A) 390
Busvine, J R bed bug 453
Butler H O emotion and diastolic pressure (C) 26, 61
Butler T L (O) 56
Buzzard Sir F reconstruction in practice of medicine, 343
Byars L T Blair V P and Moore, S, Cancer of Face and Mouth (R) 46

C

Caddell E. D (O) 723
Cæsarean section see Obstetrics
Cairns, H, on injuries to nervous system, 11
Caisson disease (A) 146
Calcium—phytic acid and (Bennett) (C) 572, 720 590 (A) 595 (LA) 623 679 (Bacharach) (C) 780 (Harris) (C) 780, Sulkowitch test in nutrition survey (Linder and Latsky) 105, thyroid gland and (A) 113, (Robertson) 672 see also Blood, Bone, Bread Nutrition, and Teeth
Calculi, see Biliary and Ureteric
Caldwell J A, Treatment of Fractures (R) 708
Campbell, R B (O) 490
Campbell R M, on infantile gastroenteritis (A) 177
Canadian—orthopædic unit for Scotland, 87 public health nursing 560
Cancer—Cancer of Face and Mouth (Blair, Moore, and Byars) (R) 46 growth, new growth and 323, Imperial Cancer Research Fund 491, (A) 509 719, increased mortality from 637 inquiry, 363, (A) 389 melanoma of iris, 734 melanoma of tonsil 61 œstrin and 323, (A) 509, organised treatment of (A) 768 772, sputum films and 354 transmission of by suckling, 325, (A) 509 trauma and (Currey) (C) 520, (Holt) (C) 631 see also British Empire Cancer Campaign, Industrial medicine, Nervous system, Peptic ulcer Radiotherapy, Sternal puncture Viruses and—
Cancer of—breast 123 364, (A) 389 509 in male (Williams) 701 colon liquid paraffin and (Burnet) (C) 693 (Twort) (C) 750 prostate serum phosphatase and (LA) 14 rectum (Carcinoma of Rectum) (Norbury) (R) 12 liquid paraffin and (Burnet) (C) 693 (Twort) (C) 750 uterus 363, charcoal blanket and (Alstead) 669 (LA) 767
Cannon W B, Body as a Guide to Politics (R) 738
Canteens see Nutrition
Cape Town health of 279
Capillary fragility—vitamin P and 248, see also Hæmorrhage and Vitamin C
Capon, N B, vitamin K for newborn (C) 602
Car—gadgets, modernistic, 304 (Foley) (C) 366, see also Road accidents
Carbohydrate metabolism see Diet, Glycosuria Insulin and Vitamin B
Carcinoma see Cancer
Card W I histoplasmosis 224
Cardiovascular—Synopsis of Diseases of Heart and Arteries (Herrmann) (R) 294, syphilis (A) 360 383 (LA) 684 778, see also Arteries, Capillary fragility, Circulation Coronary, Heart and Veins
Carlill, H (O) 521
Carling, F, nursing conditions (C) 125, 519
Carling, R, on growth and new growth, 323
Carmichael J, case history in diagnosis (C) 519
Carmichael prizes, 671
Carpal scaphoid fractures of, 118
Carrière, H, death of, 156
Carter, A B glandular fever with jaundice, 102, (A) 112
Carter G B, nursing profession (C) 59
Carver, A E on fear of noise (A) 330
Cassels K., library facilities for students (C) 722
Casts, see Kidney and Transfusion
Casualties—(P) 272, 748 at Pearl Harbour (A) 482, in the desert (LA) 766, medical 126 156 187, 218, 341, 370, 403 432 462 491, 522 550 608 782, underground hospital for (A) 657 see also Air-raids, Burns, E M S - First aid, Injuries Poison gas, Psychiatry, Services and Wounds
Cat-bites (A) 452
Catgut, see Surgery
Cattell R B, on character test 311
Cattle—disease in, 395, (A) 596 (LA) 621, (A) 660 688 · see also Milk and Nutrition
Central Midwives Board see Midwifery
Cerebral, see Brain and Intracranial
Cerebrospinal fever—in French Congo, 458 war and, 190, (LA) 201, see also Meningococcal
Cerebrospinal fluid—contamination of (Schuster) (C) 124, in spinal anæsthesia (Smart) (C) 27, (Hewer and Garrod) (C) 275, see also Chemotherapy and Meningitis
Certificates, see G M C, Milk and Nutrition
Cervix, see Uterus
Chadwick lectures 218
Chagas's disease 626
Chalmers A K, death of 1 ion 606,
Change of life, see Menstruation
Chapman, H E Marketing and Sale of Medicines (R) 534
Character, see Psychology
Charatan F B library facilities for students (C) 694
Charcoal—(LA) 767, blanket for deodorising discharges (Alstead) 669 (LA) 767, see also Wounds
Charities—Annual Register of Charities, 385
Cheese lactic certificates for, 671
Chemistry, pathological see Pathology
Chemotherapy —agranulocytosis and (Cross) 9, 354 anæsthesia and (A) 297, diffusion of sulphonamides into body fluids and tissues (LA) 564 (Lum) 585 Dr Mann lectures on 188 estimation of sulphonamides 606, (Hawkins) (C) 694, (Fuller and Colebrook) 760 fæcal concentrations of sulphonamides (Hawking) 290, 704, mode of action bacterial nutrition and (Rubbo and Gillespie) 36, (LA) 47 (McIlwain) 412 resistance to (Francis) 408, (LA) 418 (A) 596, Sulphanilamide and Related Compounds in General Practice (Spink) (R) 172; see also Soluseptasine Sulphadiazine, Sulphaguanidine, Sulphamethazine, Sulphanilamide, Sulphapyridine, Sulphathiazole and—
Chemotherapy of—burns, 377 (LA) 709, (A) 769 cerebrospinal fever 310, eye diseases, 755, gonococcal arthritis 652, impetigo (A) 422 (Schlesinger and Martin) 527 (Steigman) (C) 632, pneumonia 190 (LA) 201, 510 puerperal infection 427; streptococcal mastitis in cattle (A) 688 wounds (LA) 418 474, (A) 769
Chest—foreign bodies in (Morlock and Edelston) 138 (ML) 119, 216 302, (Rusby) (C) 400, (A) 482 (Dale) (C) 573, war wounds of, 148 216, (A) 482, (LA) 766 hæmothorax and, 702, see also Empyema, Heart Lung Pneumomediastinum and Sympathectomy
Chick H proteins in wheat flours, 405
Chicken bone swallowed (ML) 149
Chickenpox severe (A) 659
Chiesman W F, on skin injuries from vesicants, 270
Child care see Children and Nurseries
Childbirth—blood viscosity and 162 (A) 176, closure of ductus venosus and (A) 392, psychology and (Jones) 695, (Scott) (C) 751 (Loeser) (C) 751 registration of birth false statement and 735, see also Contraception Infants Maternal mortality, Midwifery, Obstetrics Pregnancy, Reproduction, and Uterus
Children—advisers on child care, 227, (P) 748 allowances for 607 (P) 633, 634 747 child health planning group (C) 123, 782 chronic lung disease in (A) 687 cross infection in (Ludlam and Henderson) 64, (A) 177 301 (LA) 387, (A) 390 deaf auricular or oral training for (A) 624, fluid therapy for (A) 177, postoperative (Arnott and Young) 323, (LA) 335; head injuries in 170 (A) 421 732 604 illegitimate (A) 328, jaundiced (Ockman) (C) 489 mortality of in United States (A) 745, on land (P) 776, outpatient problems in (Paterson) (C) 336 overactive (A) 421, Palestine health centre and 513, phenothiazine death in child (ML) 86, pink disease in (A) 18 · pulmonary tuberculosis in 516, Schizophrenia in Childhood (Bradley) (R) 142, teeth of, 53 572 (A) 687, fluorosis and (Murray and Wilson) 98 649, tonsil operations in, management of (Gerrie and Mackenzie) 759, (LA) 765, see also Adolescents Infants, Juvenile delinquency, Mental deficiency, Nurseries Nutrition, School children and Sex
Children's Nutrition Council 724
China—Red Cross hospital in (Horder) (C) 215, see also Hong-Kong
Cholagogue from curcuma (A) 205
Cholecystography see Biliary system
Christian Democracy (Temple) 462
Cinematograph films—medical 188, (Gillies) (C) 213, in colour, for first aid training (Humble and Mearns) 569, see also Science
Circulation—cerebral mental disorder and, in old age (A) 84 ductus venosus, closure of (A) 392 see also Blood, Blood-pressure and Cardiovascular
Cities—growth of 724, see also Housing, Planning, and Public health
Civil defence, see A R P
Cleavage lines 440 (A) 451
Cleckley, H Mask of Sanity (R) 386
Clegg H W plasma transfusion in hospital ship 191 (LA) 505
Clegg J G (O) 125
Close H G, agranulocytosis, 99
Clover's inhaler see Anæsthesia
Coal miners see Miners

Coast closed areas on, 520
Cobb, S Foundations of Neuropsychiatry (R) 142
Cod liver oil—related substances and, for wounds (Dunn, Glücksmann, and Tansley) 95 , *see also* Vitamins
Cohen, C L (O) 578
Cohen, E L acne, 168
Cohen, H trauma and leukæmia (C) 365
Cold *see* Temperature
Colds, *see* Respiratory infections
Colebrook L , estimation of sulphanilamide, 761
Colitis, *see* Colon
Collins D H , staphylococcal septicæmia, 470, (A) 480
Collis, W R F , vitamin K for newborn (C) 632
Colon—ulcerative colitis, 753 , *see also* Intestinal
Colorimeter, *see* Photoelectric colorimeter
Comfort A students in uniform (C) 337
Communicable diseases, *see* Infectious diseases

CONFERENCES AND CONGRESSES —Agricultural reconstruction (A) 392—Children's nutrition, 724—Collective feeding, 706—Ex-Services Welfare Society, 534—Ophthalmology, 753—Pharmaceutics, 734—Physical education, 280, 396—Rehabilitation, 312 424—Social biology, 696—Worker s health, 312, 424, 491, 662, 706, (LA) 711

Connell, W V , zipp (C) 305
Constipation, *see* Paraffin, liquid
Contact lenses, plastic (A) 744
Contraception—Family Planning Association report, 167 , volpar products, risks of (Stopes) (C) 58, (Jackson) (C) 123, (Nicholas) (C) 124 (Baker) (C) 154 , *see also* Population and Sex
Convalescence, *see* Coast and Hospitals
Convulsion therapy, *see* Shock therapy
Cook, G T neurosis simulating organic disorder 31 (LA) 231
Cook, J B hernia (C) 367
Coope, R , on chest wounds, 148
Cooper, K E outbreak of paratyphoid B, 129, (LA) 173
Cope, C L aspiration of petrol 469
Copeman, W S C , *Diplococcus rheumaticus* (C) 603
Cornchan, M death of (A) 391
Corneal, *see* Eyes
Coronary disease—(Reid) 313, (LA) 388, (Bach) (C) 399, (A) 658 , anoxæmia test and (A) 330, (LA) 388, (Lewsen) (C) 519 , *see also* Heart disease
Corpse *see* Autopsies
Cotton sutures *see* Surgery
Coutts, J , antiseptic emulsions (C) 461
Coventry, J B , gingivitis in Forces (C) 153, (LA) 232
Cowen W , drying plasma and serum, 281
Cox, F M (O) 521
Cox, H T , on cleavage lines (A) 451
Craddock, S , penicillin in cultivation of acne bacillus 558
Crawford J W (O) 722
Cream, synthetic—(LA) 173, 593 , *see also* Enteric fever
Crime, *see* Legal medicine
Cripples, *see* Injuries and Orthopædics
Cross R. M , agranulocytosis, 9
Cross infection—301 , face masks and, 301, (LA) 387 hospital bathroom and (A) 16, 177, 408 in infants and children (Ludlam and Henderson) 64, (A) 177, 301, (LA) 387, (A) 390 , of wounds and burns (A) 16 301, (LA) 387, (Francis) 408, (LA) 418, 430, 471, (A) 566, 596, (LA) 709
Crossword, 696, 724
Crowe, S J , and Bothman, L , Year Book of Eye, Ear, Nose and Throat (R) 592
Crowther, J G British Scientists of Nineteenth Century, 30
Cruickshank, A B , Rose and Sellors mask 587
Cruickshank R , on cross infection, 301
Crumbie, J R , improved leucotome (NI) 654
Crush injuries, *see* Fractures and Injuries
Ctab (Barnes) 531, (Berry) (C) 632, (Gardner) (C) 721
Cumings, J N , on head injuries, 354
Cunningham A A , on infantile gastroenteritis (A) 177
Cunnington, C W , is it a record ? (C) 721
Curare (A) 420
Curcuma (A) 205
Currey, E F N , trauma and cancer (C) 520
Curriculum, *see* Education, medical
Cuthbertson, D P , post shock metabolic response, 433
Cutts, J G , meningococcal endocarditis, 292
Cyclotron (A) 81, (LA) 326
Cysticercosis, unrecognised (Brailsford) 127
Czech examination pass list, 491

D

Dacie, J V , pernicious anæmia (C) 520
Dale H W L trichlorethylene (C) 573
Daley, W A , on maternity services, 652, 696
Dangerous drugs—League of Nations report on, 415 NWF and, 341
Dann, L , cod liver oil for wounds, 95
Davidson, I A (O) 692
Davidson, L S P , pernicious anæmia (LA) 358, (C) 428 , and Dunlop, D M and McNee, J W Textbook of Medical Treatment (R) 416
Davidson, R S nursing profession (C) 186
Davie, T M , divorce for insanity (C) 667
Davies D L , suture material (C) 399
Davies, F , Hartmann's pouch, 193
Davies, G M , on shelters (A) 329
Davies H M , on hæmothorax from war injuries, 302
Davies, I G outbreak of paratyphoid B, 129, (LA) 173
Davies, J N P , sulphonamides and enteric fevers (C) 307
Davies, T A L , training courses for unfit (C) 459
Davies, W , and Stapledon, Sir G , Ley Farming 629 (A) 660
Davis, E , somnambulism (C) 186
Davis, G B (O) 308
Davis, L J , pernicious anæmia (LA) 358, (C) 428
Dayton, N A New Facts on Mental Disorders (R) 108
de Chalus, C H F (O) 56
de Souza D H (O) 490
Deafness—auricular or oral training in (A) 624 , new hearing aid, 347 *see also* Ear
Death, sudden (A) 330
Death rate *see* Vital statistics
Debts *see* Medicine and the Law
Dehydration, postoperative, *see* Fluid therapy
DeLee J B , and Greenhill J P , Year Book of Obstetrics and Gynæcology (R) 682
Delinquency, juvenile, *see* Juvenile delinquency
Delory, G E , micro chemical blood analysis, 207
Dental—Dental Board finance (A) 147 , memoranda (LA) 449 (A) 687 , scheme at Cambridge 53 (P) 634 , services future of, 53 (P) 634, (A) 687, supply of dentists and (A) 328, 371, (LA) 449, (Facing the Facts) (Samson) 572 572, 580 , students meeting, 580 , *see also* Teeth and—
Dentists Register—371 , *see also* Dental
Deodorising, *see* Charcoal and Wounds
Depression, *see* Psychiatry
Dermatology *see* Skin
Derry, D C L histoplasmosis 224
Des Vaux, H A (O) 665
Diabetes—aneurine in (Kodicek) 501 , fatality rate of, 428 , presenting as psychological disorder, 615 , *see also* Insulin
Diagnosis—case history in (Carmichael) (C) 519 (Plesch) (C) 546 , Diagnosis of Man (Walker) (R) 416
Diaphragmatic paralysis, *see* Diphtheria
Diarrhœa *see* Gastro intestinal
Diastolic pressure, *see* Blood pressure
Dictionary medical *see* Medicine
Diet—cereals, smut infected pink disease and (A) 18 , Dietetics for Clinician (Bridges) (R) 12 , fatigue and (A) 450, (LA) 683 food value calculator 492 , post shock metabolism and, 433 , *see also* Bread Food, Nutrition, Peptic ulcer, and Vitamins
Digital, *see* Hand
Dillon F , neurosis in soldiers (C) 574 neurosis simulating organic disorder (C) 153, 186
Diphtheria—antitoxins in improved 681 , diaphragmatic paralysis and, 29, (Todesco) 261 (Begg) (C) 334 in Leicester, 29 nasal sulphanilamide in (Bois[illegible] and Fry) 610 , statistics, 29 , *see also*—
Diphthei[illegible] munisation—(LA) 417 516, (A) 568 637 (P) 748 dosage of APT (LA) 417 637 , fear and (Paterson) (C) 336 in Scotland 339 452 (P) 606 nasal (A) 567 recording Schick test (A) 567 *see also* Diphtheria
Diplococcus rheumaticus, *see*
Disinfectants—bactericides and, econom in, 430 , Ctab (Barnes) 531, (Berry) (C) 632, (Gardner) (C) 721 , disinfec given for fainting (C) 59 , *see* Alcohol, Cross infection, and Sterili tion
Dispensers—call up of, 126 *see also* *Drugs, Pharmacy, and Services*
Divorce—for insanity, (LA) 593 (Davie) (C) 667 , *see also* Medicine and the Law
Dobbs, R H , on cross infection, 302
Doctors *see* Medical man power and Practitioners
Dodd, H , pholedrine in major operations, 498
Dodds, E C , and Beaumont, G E , Recent Advances in Medicine (R) 142
Donations and bequests 466 608
Dorling, G C , staphylococcal food-poisoning, 382
Dott, N , on traumatic epilepsy, 705
Dow, J , gastro duodenal hæmorrhage, 551, (LA) 563
Dowsing experiment (P) 457, 520
Draper, W B resuscitation after overdose of anæsthetic, 442
Droplet infection *see* Cross infection and Respiratory infections
Drugs—in Germany, proprietary medicine testimonials and, 608 , in India, supply of, 19 22 , in Palestine, supply of, 601 , laxative (LA) 656, (Burnet) (C) 693, (Twort) (C) 750 naval and military medicine chests (Thompson) 548 , sale of, 119, (P) 431, 518, (Marketing and Sale of Medicines) (Chapman) (R) 534, (P) 606 (Bell s Sale of Food and Drugs) (R) 764 war time supply and use of, National War Formulary and, 19 21, (A) 145 248, (A) 267, 268, 318, 341, 342 371, 430, (P) 431 (A) 481, (P) 518, 518, (Nicol and Shute) (C) 545, 580, 601, (P) 606, (Beatty) (C) 633 (P) 634, (A) 659, 737, 744 *see also* British Pharmacopœia, Dangerous drugs, Pharmacy, Psychology, and Therapeutics
Drummond J C , on national nutrition (A) 598, 625
Ductus venosus, closure of (A) 392
Dukes, C on urea fermentation test, 354
Duncan, J T , histoplasmosis, 226 394 , systemic mycoses, 226, 393
Dunlop, D M , Davidson, L S P , and McNee, J W , Textbook of Medical Treatment (R) 416
Dunlop, G , shock (C) 334
Duodenal, *see* Gastro intestinal and Peptic ulcer
Dust, *see* Cross infection Pneumokoniosis, and Respiratory infections
Dyke, S C liver extracts (C) 185
Dysentery—chemotherapy of, 20, (Hawking) 290 , cross infection and 301, (LA) 685 , Difco SS agar in (Pot) 677, (LA) 685 in East Africa, 217 , prevalence of, 515 , priority eggs and, 24, (A) 389 , tellurite medium in (Thomas and Hulme) 321
Dyspepsia, *see* Peptic ulcer, Services, and Stomach

E

Ear—Diseases of Nose Throat and Ear (Hall) (R) 386 , glycerin drops substitute for (Beatty) (C) 633 Manual of Otology, Rhinology and Laryngology (Ballenger) (R) 682 , turpentine instilled into (ML) 601 Year Book of Eye, Ear Nose and Throat (Bothman and Crowe) (R) 592 *see also* Deafness
Eason H L presidential address, 660, 715
East Africa *see* Africa
Eaton A G and Andes J E , Synopsis of Applied Pathological Chemistry (R) 764
Edelston, B G *foreign bodies in air* passages 138
Edelston H , on child guidance, 30 , whole man (C) 750
Education medical—acceleration and curtailment of 184 (P) 545 694, 715 716, (A) 712 737 (P) 748 782 , in psychiatry (A) 450 , in public health, examinations and, 738 , in radiology (A) 508 772 reconstruction of (Morson) (C) 506, (Buzzard) 343, 422 (A) 451 772 premedical curriculum and (Beadle) (C) 275 345 (A) 451 *see also* Students, medical and Universities
Edwards H C , pancreatic fistula 137
Edwards M M , nursing career (C) 27, 154
Edwards R , on chest injuries, 148
Eire, *see* Ireland
Elbow-joint—arthrodesis of (A) 742 , ossification around 118

General Medical Council—certification, improper, 735, 736 curriculum, curtailment of 715, 716, (A) 712, 737 hospital policy 715 , penal cases, 715, 735, due inquiry and (ML) 149 (LA) 447, 781 , presidential address, 660, 715 , press publicity 715 , public health examinations, 738 , reciprocity with Queensland, 715 *see also* British Pharmacopœia and Medical Register
Genetics—hernia (Evans) 293, (Cook) (C) 367 psychoneuroses (A) 660, (Brown) (C) 721 , Seasonal Influence on Growth, Function and Inheritance (Fitt) (R) 654
Genital hypertrophy *see* Infants
Gentian violet, *see* Burns
George medals *see* Honours
Geriatrics, *see* Old age
Germany—burns, treatment of, 337 , Medical Guide for Flying Personnel (von Diringshofen) (A) 713 Nazi Attack on International Science (Needham) (A) 52 proprietary medicines, 608 , selection of army officers 311 typhus (P) 152, 273, 371, 425, 442, 483, (LA) 506, 650 , *see also* Foreign
Gerrard, E A , antiseptic emulsions in burns, 347
Gerrie, J basal narcosis for tonsil operations, 759 (LA) 765
Gibson A , on malignant cells in sputum films, 354
Gibson, A K (O) 308
Gibson, C C G (O) 578
Gidney, Sir H (O) 607
Gilchrist M L , war time nurseries (C) 185
Gill, A M dyspepsia, 727, (LA) 740
Gillespie, J M , mode of action of sulphonamides 36, (LA) 47
Gillespie N A Endotracheal Anæsthesia (R) 562
Gillies Sir H plastic surgery film, 188, (C) 213 , radiotherapy in keloid, 440, (A) 451, (LA) 505
Gingivostomatitis—vitamin, virus and (Stuhl and Coventry) (C) 153, (P) 213, (Parsons) (C) 214, (LA) 232, (Stuhl) (C) 276, (P) 337 338, 395, (Stammers) (C) 574, (LA) 655 (Steigman and Scott) 761 , *see also* Thrush
Gissane, W , on rehabilitation of injured worker, 424
Glands, endocrine, *see* Endocrinology
Glandular cheilitis 404
Glandular fever—granulocytopenia and (Sears) 703 , jaundice and (Carter) 102, (Gold) 103 (A) 112, (Martin) (C) 153
Glass wounds (LA) 14, 188
Glen, M , sodium amytal and intelligence-test scores, 676, (LA) 683
Glücksmann, A cod liver oil for wounds, 95
Glucose, *see* Fluid therapy and Glycosuria
Glycerin ear drops, *see* Ear
Glycerin supply, *see* Drugs
Glycosuria—renal hypoglycæmia and (Rubie) (C) 241 , *see also* Diabetes
Gold, S glandular fever with jaundice, 103 (A) 112
Goldblatt, M W on industrial medicine, 568
Golden, R , Diagnostic Roentgenology (R) 324, 386
Goldman, J , sulphamethazine, 639, (A) 686
Goldman, V , Aids to Anæsthesia (R) 446
Goldthwait, J E Brown, L T Swaim, L T , Kuhns J G , and Kerr, W J , Body Mechanics (R) 592
Gonorrhœa—arthritis, rheumatism, and, 652 chemotherapy of (Laird) 463, (Fairbrother Aymer, and Ashton) 464, (LA) 478, 639, 652, (A) 686 , *see also* Venereal disease
Goodall, E , future of medical research (C) 158
Gordon, J , foreign bodies (C) 604
Gordon Taylor G amputation 669
Gottlieb B vitamins in ophthalmology (A) 151, (C) 547
Gould, H M , food borne epidemics, 129, (LA) 173
Gould, J subconvulsion therapy (C) 520
Gould's Medical Dictionary (Brownlow) (R) 294
Graduation, *see* Education, medical, and Universities
Grafts—bone, 118, (Architectural Principles in Arthrodesis) (Brittain) (A) 742 replacement of avulsed tissue, 77 , skin 77, sulphonamide resistant streptococci and (Francis) 408 (LA) 418, (A) 596 , *see also* Burns and Wounds
Graham E A Year Book of General Surgery (R) 386
Graham Little, Sir E , national bread (C) 57, 460, 720
Grant, J , Science for the Prosecution (R) 142
Grant R T , on shock (A) 265
Granulating areas, *see* Burns and Wounds
Granulocytopenia—glandular fever and (Sears) 703 , *see also* Agranulocytosis
Grass, *see* Nutrition
Gray, C H , crush fractures of os calcis, 106
Gray, J H (O) 28
Green-Armytage V B , Emergency Medical Service (C) 27, (LA) 143
Greene, R , on effects of cold on extremities (LA) 47
Greenfield, J G , on cerebral œdema, 262
Greenhill, J P , and DeLee, J B , Year Book of *Obstetrics and Gynæcology* (R) 682
Greenwood, M , medical graduation at Cambridge 63
Griffiths, H E , on return to work, 533
Griffiths, H F , trichlorethylene anæsthesia, 502
Grimsdale, H B , death of, 598 (O) 636
Grollman A , Essentials of Endocrinology (R) 172
Grow, M C , and Armstrong, H G , Fit to Fly (R) 562
Growth—323 Seasonal Influence on Growth Function and Inheritance (Fitt) (R) 654 , *see also* Cancer, Endocrinology, and Nutrition
Guirdham, A , Disease and Social System (R) 562
Gum acacia, intravenous (A) 300
Gut *see* Intestinal
Gutmann, E , electrotherapy and denervated muscles, 169
Guttmann, L , electrotherapy and denervated muscles, 169
Gye, W E , on cancer of breast (A) 509 , on growth and new growth 323
Gynæcology, *see* Obstetrics and Peritoneum

H

Hæmatemesis, *see* Gastro intestinal hæmorrhage
Hæmoglobinuria, march (A) 204
Hæmophilia *see*—
Hæmorrhage—air raid injury, normoblastic crises and (Humble) 157 middle meningeal (Falconer and Schiller) 532, (Page) (C) 574 (Jokl) (C) 603, (Little and McMenemey) (C) 604, (Weber) (C) 604 subungual myalgia and (Houghton and Jones) 196, (A) 205 thrombin for (A) 16 vitamins A, B, D, and, 248 , *see also* Blood, Gastro intestinal, Injuries, Obstetrics Shock Transfusion, Uterus, Vitamin C and Vitamin K
Hæmorrhoids, operation for (Stevenson) (C) 91
Hæmothorax *see* Chest
Haldane, F P , jaw control in convulsion therapy (C) 27
Haldane J B S , on gases at high pressure (A) 146
Hall, A S , mass radisocopy, 161, (LA) 357
Hall, I S Diseases of Nose, Throat and Ear (R) 386
Hall, S B , and Hall, M B , mental instability, 376
Halnan, E T , on animals as food converters 395
Halton, J , on anæsthesia in chest wounds, 216
Hamilton, J E , on peritoneoscopy (A) 540
Hammer toe, *see* Foot
Hammermann, A , Association of Austrian Doctors (C) 307
Hand—adherent flexor tendons, amnioplastin for (Pinkerton) 70 , animal and human bites and (A) 452 finger agnosia (Spillane) 42 (LA) 201 infections of (LA) 14, (Pinkerton) 70 (A) 452 713, food poisoning and (Dorling) 382 Principles of Anatomy as seen in Hand (Jones) (R) 620 *see also* Burns Cross infection, Disinfectants, Enteric fever, Sterilisation X rays and—
Handicraftsman—status of, in history, scientific progress and (A) 626 , *see also* Industrial medicine
Harding H E , Hartmann's pouch, 193
Hardy E , control of rats 158
Hardy, K H , staphylococcal septicæmia, 470, (A) 480
Hargreaves, W H , on spider bite (A) 361
Harker M E , mongolian identical twins (C) 779
Harley G W , Native African Medicine (R) 682
Harris, A , mental instability (C) 461
Harris, H A , foot function, 32
Harris, I , bread (C) 780 , protein young (C) 399
Harris, L J , vitamin C levels, 642, (LA) 655, 679
Harrison, D C , on phytic acid and 595
Hartmann's pouch (Davies and 193
Haslewood, G A D , micro chemical analysis 207
Haultain, W F T , on œstrogenic 372
Hawking, F , sulphonamides in fæces, 290, 704
Hawkins, E S , estimation of sulp mides (C) 694
Hawks, J C (O) 692
Haydon Baillie, M , fractures of femoral neck (C) 459
Hayes, M , somnambulism (C) 186
Head injuries—10, 262 (A) 298, 354, 420 538, 614, (A) 687 , Acute Inj[illegible] of Head (Rowbotham) (R) 738 epile[illegible] and, 705 , in children, 170, (A) 421, 5[illegible] 604 , middle meningeal hæmorrh[illegible] without fracture (Falconer and Schill[illegible] 532, (Page) (C) 574, (Little and McMene mey) (C) 604 (Weber) (C) 604, boxing and (Jokl) (C) 603 , *see also* Nervous system and Wounds
Health education—Modern Approach to Health Education (R) 476 , pictorial in Army, 62 , Simple Health Hints (Bro man) (A) 114 , VD educational work 462 482 vermin, pamphlet on, 522, *see also* Cinematograph films, First-aid, Medicine, and Sex
Health services—in Hong Kong (A) 19, in Ireland, 121, 236 303 , in New Zealand, 771 in Palestine 513 , in United States 128, 155, (Administrative Medicine) (Emerson) (R) 356, 386, (A) 508, 559 , L C C , expenditure on 522, reconstruction of (Buzzard) 343, (Lyburn) (C) 366, (A) 768, 772 Medical Planning Commission on (LA) 739 (C) 777, (C) 778, (LA) 765 , reconstruction of positive health aims, economic and educational problems and, 343 (Health of the Future) (Bourne) (R) 708, (A) 713, (LA) 765 , *see also* Dental, E M S , Hospitals Industrial medicine, Insurance, Midwifery, Practitioners, Public health, Schools, and—
Health visitors, 342, 559
Hearing *see* Deafness and Ear
Heart *see* Operations and—
Heart disease—Austin Flint murmur (A) 112 ballistocardiography in (A) 82 beriberi (Stannus) 756, alcoholic (Bowe) 586, 756 , Cardiac Clinics (Willius) (R) 738 , Cardiac Symptoms in Neuroses (Baker) (R) 446 decline in, in children 516 , Diseases of the Heart (Lewis) (R) 682 , groups B, C, and G streptococci and (A) 83 , meningococcal endocarditis (Cutts, Krafft, and Willcox) 292 mercurial diuretics and (LA) 448 nicotinic acid in angina (Moncrieff) (C) 633 , parasitic 626 polyuria nocturnal, and (Leak) (C) 26 (A) 178, posture during sleep and (Leak) (C) 26, (Holt) (C) 124, (A) 178 , Principles and Practice of Cardiology (Bramwell and King) (R) 764 , referred pain and (A) 50 , right heart failure early symptom of (A) 623 sudden death and (A) 330 , *see also* Cardiovascular Coronary disease Electrocardiography, Embolism, Kidney, Rheumatism, and Thyrotoxicosis
Heartburn (A) 362
Heat *see* Temperature
Hebb Sir J , death of 236 (O) 277
Heggie, J F , and Heggie R M antiseptic emulsions in burns 347, (C) 547
Heidel, W A , Hippocratic Medicine (R) 386
Hemiplegia *see* Body scheme and Intracranial
Henderson D K , on proposed psychiatric clinic 340 on war neurosis and psychosis, 554
Henderson J L , neonatal thrush 64 , vitamin K for newborn (C) 546
Henderson V E Medical Guide for Flying Personnel (A) 713
Heredity *see* Genetics
Hernia—hereditary tendency to (Evans) 293, (Cook) (C) 367 operation for soldier s death and (P) 545
Herpes simplex virus—(Steigman and Scott) 761 *see also* Gingivostomatitis
Herrmann, G R , Synopsis of Diseases of Heart and Arteries (R) 294
Hewer, C L not so sterile labels (C) 275
Hewer T F , paratyphoid B infection 132
Hewitt, L F , on improved antitoxins 681

Highet, W B, peripheral nerve injuries 555, 591
Himes N F, Happy Marriage (R) 291
Hindmarsh T A suture material (C) 429
Hip—arthritis of 117 arthrodesis of (A) 742, congenital dislocation of, 118
Hip syrup *see* Vitamin C
Histoplasmosis of Darling (Derry, Card, Wilson, and Duncan) 224 391
History, medical—Austin Flint murmur (A) 112, British Medicine (Wilson) (R) 172, Cooper, Sir Astley, centenary of, 311, Four Treatises by Paracelsus (Sigerist) (R) 504, handicraftsman and (A) 626, Hippocratic Medicine (Heidel) (R) 386, middle meningeal hæmorrhage Montaigne on (Page) (C) 771 (Weber) (C) 604 naval and military medicine chests (Thompson) 548 plague rats mice and (A) 568, Story of Clinical Pulmonary Tuberculosis (Brown) (R) 78 two world wars (LA) 13 *see also* Biography
Hobson F on prothrombin estimation, 354
Hodgson, H G on radiological education 772
Holdsworth, F W on wound treatment 374
Holland L F, on maternity services 631
Holt H D epidemic paratyphoid 133, (LA) 173, 341 (LA) 685
Holt, Sir M posture during sleep (C) 124 trauma and cancer (C) 631
Home Guard *see* Services
Hong Kong health services (A) 19
Honours—178, Birthday 741 (A) 742 782 gallantry 94 280 370, New Year, 54 (A) 52 *see also* Services
Honyman Gillespie lectures, 84, 248 279, 372, 461 484, 608 752
Horder, Lord on campaign against rheumatism 128 Red Cross hospital in China (C) 215
Hormones—antihormones and (LA) 203, *see also* Endocrinology Growth and Sex hormones
Horne, J I sulphonamide rash (C) 779
Horsley, Lady death of 19
Hoskins R G, Glands and their Functions (R) 620
Hospitals—adolescents' (C) 572, children's hospitals and (Fleming) (C) 631, American ambulances for Britain, 218 American hospital census (A) 712 charcoal as deodorant in (Alstead) 669, (Seddon and Florey) 755 (LA) 767, children's outpatient problems (Paterson) (C) 336, convalescent (Reid) 278, emergency grant to 579 flag day 312, 550 future development of 91 (Platt) 179 (Alcock) (C) 239, 278 (C) 307, 341, (Buzzard) 343 491 (P) 542 543, 608, 638, 715, 778, (LA) 765 Irish, problems of, 121 303, 754, L C C, expenditure on 522 maternity hospital for soldiers wives, 754 national loaf and (P) 152 neonatal thrush in maternity hospital (Ludlam and Henderson) 64, Palestine, 601, Red Cross hospital in China (Horder) (C) 215 Scottish 87 94 319 (A) 659, waiting lists and 121, temperature taking in (Parry) (C) 632, *see also* Cross infection, Disinfectants E M S, Health services Medical man power, Medicine and the Law, Mental hospitals, Nurses, Operations, and—

Hospitals—Birmingham Accident Hospital (A) 204, 312 424—Churchill Hospital, opening of, 183—Craiglockhart Hospital Edinburgh Norwegian hospital in 149—Middlesex Hospital radiotherapy school (A) 508—Rhymney Cottage Hospital 28—Roehampton Hospital, underground extension (A) 657—Royal London Ophthalmic Hospital ward for nurses of Free French Forces 149—Royal National Throat Nose and Ear Hospital, 403—St John's Hospital for Diseases of the Skin, London 461, 608 722—Sheffield Royal Infirmary, 466—Westminster Hospital election 693, gift, 608

Houghton L E myalgia following sore throat, 196, (A) 205
Housing—Housing for Health (Winslow) (R) 200 Municipal Year Book (R) 764 *see also* Cities and Planning
Howe E G misfortune not followed by depression (C) 632
Howitt F Army physical development centre 373, on return to work 534
Hoyle C zinc peroxide preparations 7, (LA) 418
Hudson, R V intraperitoneal sulphanilamide 437 on shock (A) 265
Huggett, A St G, on embryo as patient, 93
Hughes I on shelters (A) 329
Hughes F B on urinary diastase in acute abdomen 77
Hughes, I on endothoracic sympathectomy, 77
Hughes J H, on infected hæmothorax 503
Hulbert N G, organic diseases presenting as psychological disturbances 614, (A) 62
Hulme W A, tellurite medium in dysentery 321
Humble R H colour films in first aid training 569
Humble, J G, normoblastic crises after injury 137
Hume C W control of rats (C) 276
Humphries C S (O) 56
Hunterian specimens, *see* Royal College of Surgeons
Hurst Sir A intestinal flatulence 223 (A) 234, severe gastric hæmorrhage (C) 750
Hygiene *see* Army Medical Service and Public health
Hyman G on ossification around elbow joint 118
Hypertension *see* Blood pressure
Hypoprothrombinæmia *see* Blood and Thrombosis

I

Ikin E W, on blood groups (A) 509
Illegitimate motherhood (A) 328
Immunology—antihormones (LA) 203 direct photographs of antigens and antibodies (A) 177, improved antitoxins 681 nasal immunisation (A) 567 oestrone and antibodies (A) 40 *see also* Abortion contagious Anaphylaxis Diphtheria Measles Pertussis Plague Rickettsial Tetanus and Typhus
Imperial Cancer Research Fund 491 719 report (A) 709
Imperial Chemical (Pharmaceuticals) Ltd, 491
Impetigo *see* Skin

In England Now—Air raids 5 210 238 629 630 636 664 first aid post re visited 180 rebuilding London 304 shelters re-visited 150—Alcohol anæsthetic effect of 664—Animals 5, 718 as patients 151, 599 birds study of 155 570 691 745, evolution aspects of 600 Penelope's hen 691; pigs clean 305, rabbit menace, 88 571—Autopsies, accommodation for 237 (LA) 243—Books 238 304, 365 456 599 Evelyn's diary, 690, Final Edition (Benson) 150 paper salvage and, 87, Plague Year (Weymouth) 664, School of Physick (Culpeper) 426 Yankee Doctor in Paradise (Lambert) 237 364—Broadcasts, 56 398 571, 664—Children at pantomime, 122, corporal punishment of, 271, evacuated problems of 364 exasperating, 664, Hopetown, 333, prize givers advice to, 746, sex instruction for, 456 515 spelling 56—Evolution aspects of, 600—Farming and gardening 88, 151, 181, 305, 332 398, 514 571, 629—First aid examination in, 87 (LA) 79 post re visited 180—Hospitals 426, 664, 717, American, 542, Chinese 663, issue of basins 630 operations, 210, 486 599 664 Penelope's hen 691, rationing, medical staff and 364, ward rounds 24 664—Initials, menace of 304—Italian prisoners of war, 210 717—Medicine and surgery American 541, burns, 514 Christian Science and 238, cold effect of 514 fractures, 272 future of, 456 485, 541, 717 intestine excretion of gases into, 600 Medical Patent Office 181, mumps, 718, operations 210, 486, 599 664 research obvious and 122 reversed foot mystery of 745 romance of 426 scabies 630, skin reactions 485, smallpox, Evelyn on, 690 tuberculosis 600 vaccination, 23, 426 570—Midwifery 456, 514, 515, umbilical cords, disposal of 572—Motoring accidents in United States, 541 gadget 304—Nursing American 542 new awards, 455—Nutrition agricultural and economic policy and, 88 hip-juice fairy story, 122, hospital medical staff rationing and, 364, infant feeding, 398, new
ration books queue for 690 nigh
blindness and, 121 war time cooke
and 332 486 571, Mrs Beeton and 45
—Paper salvage 87 reprints and 150-
Practitioners aphorisms of 515, (
veterinary surgeons 151, books b
237, 238 364 426, 664 certificate wri
ing 398, Chilean visit of 151, con
sultant's meticulous methods 664
doctor power rival claims on 74
handymen of medicine 185 invention
of, Patent Office for, 181 Medic
planning and, 456 485 541, 717 mi
dle aged respect for, 333 rural 58
serving 22 55 271 365 427, 455 48
541 599 630 663, 717 745 with Hom
Guard 22 women, 150—Psychology
Christian Science 238 corporal punis
ment 271 disability, conquest of 599
experience learning by 122, fear o
dark, 121 fear of mumps 718
feminine 150 frustration aggressio
and 599, incontinence 364, Laurelle
Psychologist, 398, letters to edito
127 mind, speed of, 455, personalit
survival of, 5 secrecy, war time 62
service and stimulation to service, 30
sex taboo 156, 515 smoking 57
suicide 514 tuberculosis, disciplin
and, 600—Ration books queueing fo
690—Science research first principl
and, 122 war effort and conference o
88—Secrecy in war time 629—Smok
abatement 597 (A) 537—Smoking
—Soap rationing, 397 (A) 537—Sport
718 afternoon's shooting 271 farm
ing for 571—Students, medical Ameri
can 541 in uniform 271 (LA) 26
job in Hygiene Stores 426 rebui
London and, 304—Travel 332 b
air 209, by road hitch hiking an
691 by sea 455, 514, 541 by trai
87 181 210 543 570 China 663 74
77, Gibraltar 599 Hong Kon
escape from 745 771 Iceland 51
74, Mandalay 304, Russia 30
Scilly Isles, 691 Shakespeare countr
630 United States 541—Verse 39
circular 15, 599—Weather and climat
cold, 485, 514 high wind, 151

Indebtedness *see* Medicine and the La
India—malaria control 512 invasion an
(LA) 505 medical supplies 39 2
Ross Institute report, 512 (LA) 505
Industrial Health Research Board—repo
(A) 206, *see also*—
Industrial medicine—anæmia toxic 62
(A) 769, notification of (A) 327 anthra
septicæmia (Severn) 9 Birmingha
Accident Hospital work of (A) 204, 42
caisson disease (A) 146 conference
312, 424, 491 662, 706 (LA) 71
courses on 322, 403 550 718 72
dermatitis industrial (P) 212, 269 (L
711 Epithelioma of Skin in Cott
Spinners (Brockbank) (A) 17, (
accidents (P) 748 776 factory medic
service (P) 211, 212 244, (ML) 269 (
431 457, 458 568, 662 (LA) 71
hostel camps for workers, 579, impriso
ment under Essential Works Orde
youth's death after (P) 719 In
labourers medical inspection of (P) 40
577, luminous paints protectio
against 628 mass X ray examinatio
and (Hall) 161 (Ellman) (C) 242, 36
248, (LA) 297, (Brailsford) (C) 30
(Jones) (C) 306, (LA) 357, (A) 714, 71
nurses, industrial, 559, nutrition
workers (A) 206 206 (Canteens at wor
(Gardiner) (A) 265 (P) 400, (A) 480 66
(P) 666 706, output, health condition
and, 87, (A) 206, (P) 211, 212, 243 24
(A) 268, (P) 273 368 400, 401 (LA) 41
424, (P) 431 457, 458 (A) 480 491, (
516, 517 522 662 (P) 666 706, (L
711, (P) 719 747, physical training an
(Davies) (C) 459 522 pioneers in (
626, quarantine, man power and (
152, research appointment (A) 300
Year Book of Industrial and Orth
pædic Surgery (Painter) (R) 735 youn
persons hours of work (P) 243, 273 36
400, 401 516, 517, 577, 719 medical ca
and (P) 431, 457, *see also* Enteric feve
Injuries Insurance Miners Nurserie
Pneumokoniosis Population, Socia
Tuberculosis, and Workmen's com
pensation
Infamous conduct *see* General Medic
Council
Infant mortality—rise in, war and 22, 18
(LA) 201 310, 427, 516, *see also* Chi
dren, Obstetrics and Vital statistics
Infants—beriberi in (Stannus) 756 cros
infection in (Ludlam and Henderson) 6
(A) 177, 301, (LA) 387, isolation an

psychological effects of (A) 390, external genital hypertrophy in (Poston and Barber) 384, gastro enteritis in (A) 177, 301 515 hæmorrhage in, vitamin K and (A) 451 481, (Macpherson and Henderson) (C) 546, (Capon) (C) 602 (Collis) (C) 632 mongolian twin (Harker) (C) 779, pneumococcal meningitis in infant (Sakula) 444 pneumomediastinum in (A) 206, (Macklin and Macklin) (C) 602 red cells of (A) 361, thrush in (Ludlam and Henderson) 64, (LA) 232 393, *see also* Breast feeding, Childbirth Children Infant mortality, Maternity and child welfare, and Nutrition
Infectious disease weekly lists of, 29, 59, 90 126 155 188, 213 245 310, 342 367, 402, 455, 492 522, 548 580, 606, 638, 695, 723 754 782
Infectious diseases—deaths from (P) 606, Handbook of Communicable Diseases (Top) (R) 476, quarantine man power and (P) 152 ultraviolet light and (A) 391, *see also* Cross infection Public health Respiratory infections, and Vital statistics
Inhaler, *see* Anæsthesia
Injuries—Accidental Injuries (Kessler) (R) 172, Birmingham Accident Hospital work of (A) 204 424 blast, 148, (Rubie) (C) 241, (Krohn, Whitteridge, and Zuckerman) 252, (A) 328 (Macklin and Macklin) (C) 602 (Montuschi) (C) 722, cancer and (Currey) (C) 520, (Holt) (C) 631 chest and lung, 148 216, 241 252, 302, (A) 328, 482, (Macklin and Macklin) (C) 602, (Montuschi) (C) 722, (LA) 766 crush renal failure and (LA) 79 EMS fracture and orthopædic centres 87, (P) 89 151 339 hand (LA) 14 70 (A) 452, 620, Hayes splint (Young) (C) 62, joint 117, 118, (LA) 173 (A) 742 leukæmia and (A) 300 (Cohen) (C) 365 (Lewsen) (C) 459 normoblastic crises after (Humble) 137 pancreatitis, traumatic, fistula and (Edwards) 137, 213, peripheral nerve 11 (LA) 14 591 (LA) 739, (A) 743, splintage of (Highet) 555 rehabilitation and 10 87 (P) 89 151, 172 (A) 204 (ML) 269 312 (P) 337 339, (ML) 363 (P) 368 410, 424 533 555, artificial limbs and (P) 245 339 634 (A) 657 for workmen (ML) 238 563, (P) 431 spinal bladder and (Stewart) 287, 752, Trauma and Disease (Brahdy and Kahn) (R) 504, *see also* Burns Casualties First aid Foot, Fractures Head injuries, Industrial medicine Shock, Surgery and Wounds
Innes, J, pernicious anæmia (LA) 358, (C) 428
Inquests, *see* Legal medicine and Medicine and the Law
Insanity, *see* Mental disorder
Insects—domestic, control of (LA) 325, (A) 714, teaching on 522 in shelters (A) 329 pyrethrum and (A) 714, spider bite (A) 361, *see also* Bed bug, Lice, Mosquitoes, Plague Relapsing fever, Rickettsial infections, and Skin
Instruments—catalogues of unwanted, 87, (C) 276 for Russia (Webb Johnson) (C) 275, (LA) 263 *see also* Disinfectants, Operations, and Sterilisation
Insulin—overdose of (ML) 238, dosage confusion and (Walther) (C) 306, (Barnard) (C) 399, (Behr) (C) 459, (Simpson) (C) 489, (Luntz) (C) 575, (Oakley) (C) 633, shortage of in Palestine, 601 *see also* Diabetes Shock therapy, and Simmonds's disease

INSURANCE NATIONAL HEALTH (*see also* Dental, Drugs and Health services)—Elderly workers and (P) 401—Extension of, 52 Edinburgh public medical service and 90—Information on additional benefits (P) 545—Practitioners organisation of 121—Women war workers and (P) 338

Intelligence *see* Mental and Psychology
Internal cartilage (LA) 173
Intestinal—concentrations of sulphonamides (Hawking) 290, 704, flatulence (Hurst) 223 (A) 234, 600, irritation by liquid paraffin (LA) 656, (Burnet) (C) 693, (Twort) (C) 750 obstruction 159, 195, (A) 235, 279, 437; response to heat and cold (A) 624, *see also* Colon, Dysentery Enteric fever Gastro intestinal Peptic ulcer, Peritoneum, and Rectum
Intracranial—aneurysm, anosognosia and (Spillane) 42, (LA) 201, embolism agnosia of hemiplegia and of blindness following (Weber) 44 (LA) 201, thrombosis, nicotinic acid in (Furtado) (C) 602, *see also* Brain, Head injuries, Meningitis, and Pituitary
Intramedullary, *see* Transfusion
Intraocular *see* Eyes
Intraperitoneal *see* Peritoneum
Intrasternal, *see* Transfusion
Intravenous—gum acacia (A) 300, *see also* Fluid therapy and Transfusion
Iodine, *see* Thyroid gland

IRELAND—Gastro enteritis committee on, 742—Hospital problems 503 754—Labourers for Britain medical inspection of (P) 402, 577—Medical Association of Eire, 754—Medical Research Council of Ireland, 187, 303—Medical treatment of evacuees in Northern Ireland 236—Practitioners interests of 754 work of, in emergency, 754—Sickness statistics, 303—Tuberculosis problem 121

Iron—requirements war time dietary and, 679, bread and (P) 337, 338, (Widdowson and McCance) 588, 679 720, (Graham Little) (C) 720, (Bacharach) (C) 780 *see also* Anæmia, Blood Nutrition, Phytic acid, and Plasma
Irradiation, *see* Physical treatment, Radiotherapy, and Ultraviolet
Ismail, A (O) 723
Israels, M C G diagnosis of pernicious anæmia (C) 487, liver extracts (C) 240

J

Jackman, W A, staphylococcal septicæmia, 135
Jackson H, on sciatic pain 141, 213
Jackson, M H volpar products (C) 123
James, J R E, local sulphonamides (C) 694
Jameson and Parkinson's Synopsis of Hygiene (Parkinson) (R) 262
Jarman T F, pneumothorax in the home (C) 123
Jaundice—catarrhal (LA) 80 in children fatty diet and (Ockman) (C) 489 plasma phosphatase and (LA) 14 *see also* Biliary, Glandular fever and Liver
Jaw control, *see* Shock therapy
Jayes, P H, on replacement of avulsed tissue, 77
Jefferson, G on injuries to nervous system, 10 on reconstruction in radiology, 772
Jennings, D, perforated peptic ulcer (C) 365, 573
Jervis J J, food substitutes (C) 749
Jessner L and Ryan, V G Shock Treatment in Psychiatry (R) 356 446
Joint Tuberculosis Council—coöperation of, with other anti tuberculosis organisations (LA) 655
Joints—Architectural Principles in Arthrodesis (Brittain) (A) 742, gonococcal arthritis, 652, pelvic dislocation, 118, *see also* Elbow joint, Hip Injuries, Knee joint Orthopædics, Rheumatism, and Shoulder joint
Jokl, E, boxing (C) 603
Joll, C A thyrotoxicosis (C) 334
Jones, A T, on occupational acne 270
Jones, E, psychology and childbirth 695
Jones, E I myalgia following sore throat, 196, (A) 205
Jones F W, louse 661, Principles of Anatomy as seen in Hand (R) 620
Jones, R A, dyspepsia, 727 (LA) 740
Jones, R M mass radioscopy (C) 306, (LA) 357
Joseph, W E, fractured pelvis, 166

JOURNALS (reviewed)—Bulletin of Health Organisation of League of Nations (LA) 536—Guy's Hospital Reports 311—Hawaii Medical Journal 158—Revista de Tuberculosis del Uruguay, 416

Jurisprudence medical, *see* Legal medicine
Juvenile delinquency—30 (P) 245 (Hall and Hall) 376, (P) 401, (LA) 536 (P) 545

K

Kahn, S, and Brahdy, L, Trauma and Disease (R) 504
Kaplan, I L, Waters C A and Firor W B Year Book of Radiology (R) 200
Katz L N, Electrocardiography (R) 446 Exercises in Electrocardiographic Interpretation (R) 620
Kay, H D, on milk production and consumption (A) 660
Kayne, G, on primary tuberculosis 454
Kellner, C E Morton, D J, and Truex R C Human Cross Section Anatomy (R) 108
Kellock, R (O) 246
Keloid (LA) 709, 739 radiotherapy in 410, (Levitt and Gillies) 440, (A) 451, (LA) 505
Kemp F H pulmonary fat embolism 228
Kerr J M M future of obstetrics 627
Kerr, W J, Goldthwait, J E, Brown, L T, Swaim, L T, and Kuhns, J G, Body Mechanics (R) 592
Kersley G D, on gonococcal arthritis and rheumatism, 652
Kessler H, Accidental Injuries (R) 172
Kidd, P, death of, 147 (O) 184
Kidney—anæmia in nephritis (A) 744, calcium and (Harris) (C) 780, crush anuria, casts and (LA) 79, intravenous gum and (A) 300 natural history of Bright's disease (Ellis) 1, 34, 72 (A) 300, pregnancy toxæmia and, 76, 484, radiography of, aortic injection and (A) 539, *see also* Blood pressure, Glycosuria Heart disease, Transfusion, Urinary, and Water metabolism
King A J, on gonococcal arthritis and rheumatism, 653
King E J, direct reading photoelectric colorimeter, 511, micro chemical blood analysis 207
King J T and Bramwell, C Principles and Practice of Cardiology (R) 764
King George VI, appointments to, 550, 598, 696
Kirby, C C (O) 752
Kirman, B H, somnambulism (C) 186
Kitchin, D H, Law for Medical Practitioner (R) 476, on divorce for insanity (LA) 593
Knee joint—arthrodesis of (A) 742, *see also* Internal cartilage
Kodicek E, aneurine in diabetes, 501 requirements of nicotinic acid 380 395
Krafft, G meningococcal endocarditis, 292
Krames, S H Therapy of Neuroses and Psychoses (R) 620
Krause, A K (O) 310
Krebs H A, national wheatmeal, 319, (LA) 357
Krohn, P L, effects of blast 252, (A) 328
Kuhns J G Goldthwait, J E, Brown L T Swaim L T, and Kerr, W J, Body Mechanics (R) 592

L

Labels ampoule infection from (Hewer and Garrod) (C) 275
Labour *see* Childbirth
Lactation—hormones and, 372, (LA) 387, (A) 567, *see also* Breast feeding
Ladell R M, Parents' Problem (R) 356
Lady Tata Memorial Trust 371, 782
Laird S M on venereal disease control 561 sulphapyridine in gonorrhœa 463, (LA) 478

LANCET, THE copies of request for, 490

Langdon Brown, Sir W, superfluous prepositions (C) 243
Laryngology, *see* Throat
Latey, W, on divorce for insanity (LA) 593
Latsky J M urinary calcium in nutrition surveys, 105
Law, *see* Legal medicine
Lawrence, R, superfluous prepositions (C) 215
Layton, T B, shock (C) 366
Lazarus, S capillary fragility, 648
Le Fanu W R medical portraits (C) 153, Sir D'Arcy Power (C) 400

LEADING ARTICLES

Abortus vaccine 621—Anæmias diagnosis of, 110, 325 358, liver extracts and 110, radio iron and, 326—Aptitude tests for Army, 709—Autopsies accommodation for 233
Blood anæmias 110, 325 326, 358 megaloblast, 325, 358 plasma phosphatase 14 platelets 535 radio iron and 326 red cell shape and size 325 358 transfusion of 79, 263 505 709, 766, in shock and hæmorrhage, 48—Body scheme, disorders of 201—Burns, 418 505 709, mustard gas 296

sarean section 594—Charcoal 767—Childbirth cæsarean section 594, luteotrophic hormone 387 statistics 201, status of midwives 49—Constipation 685—Cream synthetic paratyphoid and 173 593 685—Cyclotron 326
Dehydration in children 58—Dentists supply of 419—Dermatitis industrial 711—Diphtheria immunisation 417—Dysentery diagnosis of 685
Emergency medical service 143—Eyes chemical injuries of 14 mustard gas injuries of 296
Face masks 387—Fibroblasts 730—Films and teaching of 79—Food poisoning diagnosis of, 685—Foot foot table of allied conditions and 47—Foreign psychologists 565—Fuel rationing 505
Gingivo stomatitis vitamins vitamin and 232 655—Gonococcal infection therapy of 478
Heart disease coronary disease 388 mercurial diuretics in 448 thyrotoxicosis and 263—History medical of two wars 13—Hormones anti hormones and 263 luteotrophic 387
Injuries and wounds amputation phantom limb and 201 burns 418, 505, 709 mustard-gas 296 casualties of two wars 13 closed plaster treatment, 263, 766 deodorising bags and 767 cross-infection 387 418 505, 709 crush syndrome 79 desert surgery 766 EMS organisation for 143, eye 14 296 fibroblast reaction 731 first aid teaching of 79 foot injuries from cold 47 glass wounds 14 internal cartilage injuries 173 Russian war surgery 26 shock and 505 709 hæmorrhage and 48 sulphonamides locally 263 418 505 621 766 zinc peroxide for wounds 418—Insects 173 505, domestic 325 506—Internal cartilage 173
Kidney casts anuria and 79, mercurial diuretics and 448
Legal medicine divorce for insanity 593 infamous conduct due inquiry and 447 juvenile delinquency 326, post mortem accommodation 233—Liver catarrhal jaundice and 80 coronary disease and 388 extracts of economy in 110—Lymphocytic choriomeningitis 741
Malaria in India 505—Medical Planning Commission's report 739 765—Megaloblast, 325 358—Midwives and their college 49—Miner's burden 417
Nutrition bread wartime 111 357, 563 phytic acid and 623 gingivo stomatitis and 232 655 substitute foods 173 593, tuberculosis and 109 357, vitamin A in vegetables 477 vitamin C requirements 232, 655 vitamin standards 536
Paraffin liquid 656—Paratyphoid fever diagnosis of 173 685 synthetic cream and 173 593 685—Peptic ulcer 295 341 563, 710 740—Phantom limbs 201—Phosphatase plasma 14—Phytic acid 623—Poliomyelitis organism 622—Psychiatry bodyscheme disorders 91, 201, courage drugs for, 683, divorce for insanity 593 selection for Services 231, 709 terminology, stigma and 174—Psychologist foreign 565—Public health secrecy and 419 war and 201
Rejection, story of 565—Royal College of Surgeons restoration of, 144—Russian interchange 263
Sciatica 144—Secrecy local authorities and 419—Shock burns and 505 709 hæmorrhage and 48—Sternal puncture 110 325 358—Stomach dyspepsia in soldiers 740 peptic ulcer 295 341 563 710 740—Students in uniform 264—Sulphonamides diffusion of into body fluids 564 in burns 418 505 709 in gonorrhœa 478 local, 263 418 505 621 766 mode of action 47—Syphilis adequate treatment of 654
Thyrotoxicosis 263 — Tonsillectomy considerate 765—Transfusion 48, 263, 505 709 766, renal failure and, 79—Tuberculosis campaign against 109 coöperation of anti tuberculosis organisations in 655 mass radiology and 109 297 357 655 war and 109 201 297 357 655—Typhoid fever diagnosis of 685—Typhus 263 immunisation 506
Vital statistics, war and 201 419
Women doctors with Forces 477
Yellow fever 175
Zinc peroxide 418

League of Nations—biological standardisation (LA) 536, *see also* Dangerous drugs
Leak W N posture during sleep (C) 26, (A) 178
Learmonth J R, sympathectomy in aneurysm 385
Legal medicine—anæsthetist's liability (A) 658 autopsies accommodation for 237 (LA) 233 burial delayed (P) 719 divorce for insanity (LA) 593 (Davies) (C) 667 EMS surgeon's libel action (Sargant) (C) 124 Handbook of Medical Jurisprudence and Toxicology (Brend) (P) 46 Law for Medical Practitioner (Kitchin) (R) 476 Science for the Prosecution (Grant) (R) 142 sleepy sickness after imprisonment (P) 719 tetanus after chemotherapy (A) 770 *see also* G M C Insulin Juvenile delinquency Leukæmia Medicine and the Law and Workmen's compensation
Lehmann J hypoprothrombinæmia 318
Leprosy in British Empire 754
Leslie P H rat virus (C) 573
Leucocytes—agranulocytosis (Barsby and Close) 99 (Shackle) (C) 206 564 Pastor and (Cross) 9 leucopenia in radiographers (A) 769 *see also* Blood Glandular fever Leukæmia and Sternal puncture
Leucotomy, *see* Brain
Leukæmia—371 (A) 626 782 Spontaneous and Experimental Leukæmia in Animals (Engelbreth Holm) (R) 758, trauma and (A) 300 (Cohen) (C) 365 (Lewsen) (C) 459
Levitt W M radiotherapy in keloid 440 (A) 451 (LA) 505
Lewin P Foot and Ankle (R) 764
Lewis A neurosis in soldiers 496 on head injury (A) 420
Lewis Sir T, Diseases of the Heart (P) 682
Lewsen S C anoxæmia and coronary disease (C) 519 trauma and leukæmia (A) 300 (C) 459
Ley Farming (Stapledon and Davies) 629 (A) 660
Leyshon V N pneumococcal meningitis 352
Leyton N hormone in migraine (C) 488
Libel *see* Legal medicine
Library facilities *see* Students
Lice—control of in brigade group, 423 head (LA) 725 in school children (LA) 325, 522 580 lessons from (Jones) 661 pyrethrum and (A) 714 *see also* Relapsing fever Rickettsial and Typhus fever
Lichtwitz L Functional Pathology (R) 654 708
Ligature material *see* Surgery
Lightstone H (O) 246
Linder G C urinary calcium in nutrition surveys 105
Little C J H on *Plasmodium ovale* 354
Little, D C middle meningeal hæmorrhage (C) 604
Liver—cirrhosis of 551 coronary disease and (Reid) 313 (LA) 388, Rôle of Liver in Surgery (Boyce) (R) 416 *see also* Biliary Jaundice Vitamin K and—
Liver extracts—activity of (A) 596 economy in (LA) 110 (Dyke) (C) 185 (Wilkinson and Israëls) (C) 240, (Murray) (C) 429 *see also* Anæmia
Lloyd O C, on endometrial preparations, 354
Loaf *see* Bread
Local authorities—Municipal Year Book (R) 764 *see also* L C C and Public health
Loeser A A psychology and childbirth (C) 751
Loewenfeld C hips purée (C) 311
Loir A (O) 521
London—young Londoners in war (Bashford) (O) 239 *see also* L C C, Nurseries, and Typhus fever
London and Counties Medical Protection Society 663 774
London County Council—expenditure on health services 522, mental hospital charges 217 *see also* Nurseries Public health and Typhus fever
London School of Hygiene and Tropical Medicine 432
Loughran R L, death of 548
Louse *see* Lice
Love J K death of 714 (O) 752
Ludlam G B neonatal thrush 64
Ludwig C (O) 636
Lum E A diffusion of sulphanilamide, acriflavine and gentian violet 585
Luminous paints, protection against, 628
Lung—chronic disease of in children (A) 687 malignant cells, sputum films containing 354 mycoses and 593, petrol aspiration of into (Cope) 469 war injuries of 148 216 241, 252 302 (A) 328 (Macklin and Macklin) (C) 602, (Moritschl) (C) 722, (LA) 766 *see also* Air passages Asthma Chest Pneumokoniosis Pneumonia Pulmonary Respiration and Tuberculosis
Luntz G R W N dosage of insulin (C) 575
Luteotrophic *see* Sex hormones
Luxton R W sulphamethazine 659, (A) 686
Lyburn E F St J postwar medical legislation (C) 566
Lymphocytic choriomeningitis (MacCallum) (C) 714 (LA) 741

M

M & B 693 *see* Sulphapyridine
Macartney D W sulphamethazine 659 (A) 686
MacCallum F O lymphocytic choriomeningitis (C) 714
McCance, R A mineral absorption from white and brown bread 588 (LA) 623 679
McCartney J E, meningococcal encephalitis 219
McEvedy, P G on ulcerative colitis 753
McFadyean K, hammer toe bursitis 474
Macfarlane P G on burns 754 on sternal puncture 354
Macgregor Sir A on maternity services, 651
McGregor J S improved leucotome (NI) 654
McIlroy Dame L on maternity services, 651
McIlwain H chemotherapy and nutritional studies 412
Macintosh R R, anæsthetic flowmeters (C) 27
McKee G K, on compound fractures of leg 118
Mackenzie, I R basal narcosis for tonsil operations 759 (LA) 765
Mackenzie K (O) 308
Mackenzie K G F, spider bite (A) 561
Mackenzie M D relapsing fever (C) 275
McKissock W on wound cross infection, 302
Macklin C C air block (A) 206 (C) 602
Macklin M T, air block (C) 602
McLachlan T, rat virus (C) 489
McLellan P D, migration of foreign body, 704
MacMahon C posture during sleep (C) 242
McMenemey W H middle meningeal hæmorrhage (C) 604
McMurray, T P on orthopædic surgery, 117
McNee J W, Dunlop D M and Davidson L S P Textbook of Medical Treatment (R) 416
McNeil C on neurotic war casualties 354
McNeill G (O) 490
Macpherson A I S vitamin K for newborn (C) 546
Magill, I W, anæsthetic flowmeters (C) 59
Magurk L M (O) 246
Maingot R, dyspeptic soldier (C) 124 pancreatic fistula (C) 213
Malaria—control of without oil 782, in East Africa 217 in India 512 invasion and (LA) 505 *Plasmodium ovale* films 354, range of mosquitoes and (A) 145 transfusion and (Whitby) 581 *see also* Mosquitoes and Quinine
Malnutrition *see* Nutrition
Mammary, see Breast
Man—Diagnosis of Man (Walker) (R) 416 Man who Lived for Tomorrow (Oliver) (R) 294 *see also* Biography
Man, whole *see* Nervous disorder
Mann I on mustard gas and eyes (LA) 296 371
Man power—(P) 666 *see also* Industrial medicine Injuries, Medical man power, Population, and Services
Manson Bahr C, diseases of East Africa 217
Manual, *see* Hand
Marriage, *see* Sex
Marshall J F on mosquitoes and fire tanks (A) 597
Marshall R on organic and functional disease (A) 625
Martin J P on sciatic pain 140

Martin, L , glandular fever with jaundice (C) 153
Martin, N H , staphylococcal septicæmia, 135 , sulphonamides in impetigo 527
Martine, W R , atmospheric pollution (C) 632
Masks, see Oxygen, Poison gas, and Respiratory infections
Massage, see Physical treatment
Maternal mortality—21, 22, 191 (LA) 201, 427, 627, 651 , in Scotland (P) 25 , *see also* Obstetrics, Puerperal infection, and Vital statistics
Maternity, *see* Midwifery and—
Maternity and child welfare—progress in, 21 , *see also* Infants, Midwifery, Milk, Nurses and Nutrition
Mayneord, W V , on reconstruction in radiology, 772
Meals, *see* Nutrition
Mearns, A G , colour films in first aid training, 569
Measles—lung complications in (A) 687 , ultraviolet light and (A) 391
Medawar, P B , chemical coagulants in burns, 350, (LA) 505
Medical Association of Eire, 754
Medical boards, *see* Medical man power and Services
Medical Defence Union, presidential election, 94
Medical Insurance Agency, 690
Medical legislation, postwar, *see* Health services
Medical man power—(Green Armytage) (C) 27, (Wilkinson) (C) 58, (A) 114, (LA) 143 , civilian medical attention and (P) 211, 212 272, 273, (A) 328, 484 (P) 517, 545, 605, 694 715, 716, (A) 712, 737, 745, (P) 748, (Fox) (C) 779, 782 , medical board arrangements for hospital medical staff, 696 , *see also* Army Medical Service, Foreign and Services
Medical officers of health, *see* Public health
Medical planning *see* Health services and Hospitals
Medical Register—names restored to, 126 , *see also* Foreign and G M C
Medical Research Council—appointments (A) 300, 688 , factories report (A) 206 , pulmonary disease in miners, report on, 85, 660 689, (P) 719 , radiotherapeutic research unit, 247 studentship in experimental psychology, 126 , *see also* Official Memoranda
Medical Research Council of Ireland—303 , awards, 187 , grants renewed, 187
Medical services *see* Health services
Medicine—Administrative Medicine (Emerson) (R) 356, 386 , Gould's Medical Dictionary (Brownlow) (R) 294 , March of Medicine (R) 142 · Medicine and Mankind (Sorsby) (R) 12 , Native African Medicine (Harley) (R) 682 , Recent Advances in Medicine (Beaumont and Dodds) (R) 142 , Russian interchange (P) 213 (LA) 263 Year Book of General Medicine (R) 324 , *see also* Diagnosis Education, medical, Health services, History, medical, Legal medicine, Pathology, Research, and Therapeutics

MEDICINE AND THE LAW (*see also* Legal medicine) —Artificial limbs for injured workmen 238 363—Attendance on fellow practitioner 513—Blind masseur, alleged negligence of, 570—Blood group tests in nullity action, 570, (Sachs) (C) 721—Chicken bone, swallowed, 149—Divorce medical attendance before, fees for, 600 , nullity action, blood-groups and, 570, (Sachs) (C) 721—Fees, claim for, 600—G M C s erasure contested, 149, (LA) 447, 781—Hospitals liability for negligence of staff, 457, (Bedwell) (C) 489 privilege for records, 600 , property in radiograms 118 recovery from patient's estate 569—Indebtedness, war, relief from 269—Insanity prospective evidence of 385—Insulin overdose of, 238—Miner s series of accidents, national service order and, 301—Name change of, by Austrian doctor, 601—Operation refused by injured workman, 238, 363—Phenothiazine death after, 86—Radiograms property in, 118—Turpentine from hydrogen peroxide bottle 601—Unqualified practitioner, 689—Works doctor, workmen's compensation and, 269

Medicine chests *see* History, medical
Medicines, *see* Drugs
Medicolegal, *see* Legal medicine and Medicine and the Law
Megaloblast, *see* Anæmia
Megaw Sir J and Rogers, Sir L , Tropical Medicine (R) 230
Melanoma, *see* Cancer
Meleney, F L , on zinc peroxide (LA) 418
Mellanby, K , national wheatmeal, 319, (LA) 357 , on scabies, 628, (P) 635
Mellows, H S (O) 340
Meningitis—paratyphoid B (Ungar) (C) 125, (Patterson) 678 , pneumococcal (Levshon) 352, (Sakula) 444 , *see also* Cerebrospinal, Lymphocytic choriomeningitis, and—
Meningococcal infections—(Watts) 168 , chemotherapy of (Watts) 168, (A) 178, (Banks and McCartney) 219, (Cutts, Krafft, and Willcox) 292, 310, 639, (A) 686 , *Diplococcus rheumaticus* and (Copeman and Stewart) (C) 603, (Poynton) (C) 693 encephalitis and (Banks and McCartney) 219 , endocarditis and (Cutts, Krafft, and Willcox) 292 , ophthalmia and (A) 178 , *see also* Cerebrospinal fever
Mennell, J , crush fractures of os calcis (C) 276
Menstruation—Change of Life (Scharlieb) (R) 356 , methyl testosterone and (A) 567 , œstrogenic therapy and, 372 , *see also* Sex hormones and Uterus
Mental ability, *see* Psychiatry, Psychological tests, and—
Mental deficiency—course on, 126 , wartime accommodation for defective children 336 , *see also* Juvenile delinquency Psychiatry, Psychological tests, and—
Mental disorder—in old age (A) 84 in Scotland post war scheme and, 340 , New Facts on Mental Disorders (Dayton) (R) 108 prospective evidence of (ML) 385 , Schizophrenia in Childhood (Bradley) (R) 142 , terminology, stigma and (LA) 174, (C) 307, 485 , *see also* Brain Legal medicine Nervous disorder, Psychiatry, Shock therapy, and—
Mental hospitals—L C C 217, 522 Royal Edinburgh Hospital for Mental and Nervous Disorders, 340 , tuberculosis in (P) 90, 339 635 , *see also* Mental disorder
Menzies, M F , war time nurseries (C) 185
Mercurial diuretics (LA) 448
Methyl testosterone (A) 567 633
Meyerstein Sir E , death of, 178
Mice, *see* Lymphocytic choriomeningitis and Rats
Middle meningeal, *see* Head injuries
Midleton, Lord Army Medical Service and (P) 272, (A) 268
Midwifery—analgesics and (P) 748 chairman of Central Midwives Board, 491 , College of Midwives (LA) 49 , ex midwives, employment of (P) 634 Handbook of Midwifery (Berkeley) (R) 654 rubber glove ration and 666 , service of, 21 (Kerr) 627, 651, 696 status and salaries of midwives (LA) 49, (P) 634 , *see also* Childbirth Hospitals Maternity and child welfare, Nurses, and Obstetrics
Migraine (Leyton) (C) 488, (Mushin) (C) 546
Military *see* Army Medical Service, Services and Wounds
Milk—as effluent (A) 360 , for invalids 24, (A) 389, (P) 516, 719 , for mothers 370, (P) 516 pasteurisation of (P) 748 776 , sophistication of 637 , *see also* Breast-feeding, Cattle, and Nutrition
Miller, D , on toxæmias of pregnancy, 484
Milligan E H M , vitamin C in transported meals (C) 487
Miln, D A (O) 277
Mind, *see* Mental, Psychiatry, and Psychology
Mineral requirements, *see* Calcium Iron, and Nutrition
Miners—accident statistics (P) 635 , health and welfare of 85 (A) 114 (P) 211, 212 244, 400, 402, (LA) 417, (P) 635, 660 689, (P) 719, 747, rehabilitation and (P) 337, 368 424 (P) 747 *see also* Fuel Medicine and the Law, and Pneumokoniosis
Ministry of Health *see* Official Memoranda and Public health
Ministry of Pensions—appointment, 236 , *see also* Services
Mitchell Sir C , animal experiments (C) 749
Moncrieff, A A nicotinic acid in angina pectoris (C) 633 and Rolleston Sir H , Disorders of Blood Pressure (R) 324 , Modern Therapeutics (R) 386
Mongolian identical twins (Harker) (C) 779
Montuschi E , air block in lung blast (C) 722
Moore, J B (O) 369
Moore, S , Blair, V P and Byars, L T , Cancer of Face and Mouth (R) 46
Morlock H V , foreign bodies in air passages, 138
Morrison, J T , on shock and chest wounds, 216
Morrison, P J , antiseptic emulsions in burns, 347
Morrow, M M (O) 28
Morson, C , clinical teaching (C) 306
Mortality, *see* Vital statistics
Morton, D J , Truex R C and Ke C E , Human Cross Section Anatomy (R) 108
Mosquitoes—fire tanks and (P) 576, (A) 597 , pyrethrum and (A) 714 , *see also* Encephalitis, Malaria, and Yellow fever
Motorists *see* Car
Mouth—Cancer of Face and Mouth (Blair Moore, and Byars) (R) 46 , *see also* Gingivostomatitis, Salivary glands, Teeth, and Vitamin B
Moynihan, C A (O) 215
Mudd, S , on electron microscopy of antigens and antibodies (A) 177
Muir, Sir R , Text book of Pathology (R) 504
Mule spinners, *see* Industrial medicine
Muller, F , paratyphoid fever 104, (C) 336
Mumford, P B , on industrial dermatitis, 269, (LA) 711
Municipal, *see* Local authorities
Munro, H N , capillary fragility, 648
Murphy, B , aneurysm of splenic artery, 704
Murray D S , on frustration of medicine (A) 713 pernicious anæmia (C) 429
Murray, M M , dental fluorosis and caries, 98
Muscles—denervated, electrotherapy and (Gutmann and Guttmann) 169 , serratus magnus palsy (Richardson) 618 *see also* Injuries, Myalgia and Nervous system
Museum specimens—preservation of (A) 267 *see also* Royal College of Surgeons
Mushin, B , migraine (C) 546
Mustard gas, *see* Poison gas
Myalgia following sore throat, subungual hæmorrhages and (Houghton and Jones) 196, (A) 205
Mycoses—systemic (Duncan) 393 , *see also* Histoplasmosis and Thrush
Myxœdema, *see* Thyroid gland

N

Nabarro, D N congenital syphilis (C) 778 on anaphylaxis, 354
Nakashian, A , *Man who Found a Country*, 279
Nasal, *see* Diphtheria, Immunology, and Nose
National Association of Boys' Clubs, appointment, 677
National Society of Children's Nurseries, 402
National War Formulary *see* Drugs
Naval Medical Compassionate Fund, 510
Navy, *see* Services
Neame H , and Noble, F A W , Handbook of Ophthalmology (R) 620
Needham, J Nazi Attack on International Science (A) 52
Negligence, *see* Legal medicine and Medicine and the Law
Neligan, A R , relapsing fever (C) 215
Nelson O A on aortic injection (A) 539
Neonatal *see* Infants
Nephritis *see* Kidney
Nerves *see* Nervous system
Nervous disorder—organic disorder and (Cook and Sargant) 31 (Yellowlees) (C) 92, (Dillon) (C) 153, 186, (LA) 231, (A) 450, (Hulbert) 614, (A) 625 687, (Edelston) (C) 750 (Sharp) (C) 751 , *see also* Genetics Head injuries, Heart disease, Psychiatry, Psychology and—
Nervous system—curare in spasm (A) 420 diphtheritic respiratory paralysis, 29, (Todesco) 261, (Begg) (C) 334 , disorders of, in overactive children (A) 421, electroencephalography and (A) 421 neurosyphilis (A) 360, 614 (LA) 684, (Nabarro) (C) 778 , peripheral nerve injuries 11 (LA) 14, 591, (LA) 739, (A) 743, splintage of (Highet) 555 poliomyelitis (LA) 622 sciatica 140, (LA) 144, (Symonds) (C) 186 213, 752 , Scottish neurosurgical unit (A) 659 sympathectomy, 77, (Richards and Learmonth) 383 , *see also* Body scheme, Brain Intracranial, Muscles, Nervous disorder, Psychiatry, Spinal, and Vitamin B
Neumann, E , death of, 422
Neurology, *see* Nervous system
Neurosis, *see* Nervous disorder, Psychiatry, and Psychology
Neurosis, war, *see* Psychiatry war
Neurosyphilis, *see* Nervous system

Neustatter W L Early Treatment of Nervous and Mental Disorders (R) 416

NEW INVENTIONS —Clover's (or Hewitt's) inhaler, improved (Thompson) 324—Introducer for spinal needles (Rowbotham) 734—Leucotome improved (McGregor and Crumble) 654—Retractor improved curvilite (Wakeley) 12—Sims vaginal speculum, illuminated (Walters) 78

NEW PREPARATIONS —Adexolin (Glaxo Laboratories) 432—Alulotion (John Wyeth & Brother) 291—Azozol (Boots) 165—Benerva Compound Vitamin Tablets (Roche Products) 461—Davitamon Fre tablets (Organon Laboratories) 254—Hepastab Forte (Boots) 461—Hypnasol (Napp) 518—Perandren Linguets (Ciba) 633—Quinizarin (Burroughs Wellcome) 277—Sulphadiazine Lederle (Thackray) 638—Sulphaguanidine Lederle (Thackray) 638—Sulphonamide P Paste (Medium) (British Drug Houses) 372—Sulphonamide-P Paste (Stiff) (British Drug Houses) 372—Synkavit (Roche Products) 607

New Zealand—public health nursing 560 state medicine 771
Newborn, see Infants
Newman J F (O) 752
Nicholas J W, volpar products (C) 124
Nicol B M peptic ulceration 466
Nicol W D economy in quinine (C) 549, 580
Nicoll E A., on miners' rehabilitation centre 424
Nicotinic acid—in angina pectoris (Moncrieff) (C) 633 in cerebral thrombosis (Furtado) (C) 602 see also Vitamin B
Night-blindness (Sorsby) (C) 123 680
Nixon J A emotion and blood pressure (C) 91
Noble F A W and Neame H Handbook of Ophthalmology (R) 620
Noise, see Air raids
Norbury L E C, Carcinoma of Rectum (P) 12
Normoblasts see Anæmia and Hæmorrhage
Norris D C on return to work, 534
Northern Ireland see Ireland
Northfield, D W C, on intracranial injuries in childhood 170
Nose—Diseases of Nose Throat and Ear (Hall) (R) 386 Manual of Otology Rhinology and Laryngology (Ballenger) (R) 682 sinusitis in children (A) 657 Year Book of Eye Ear Nose and Throat (Bothman and Crowe) (P) 592, see also Diphtheria, Immunology, and Respiratory
Nosworthy M D on shock (A) 265
Nuffield Institute lectures 156
Nuffield Provincial Hospitals Trust 341, (P) 543
Nurseries and play-centres war time, 126 (P) 152 (Gilchrist and Menzies) (C) 155 (P) 211 217 227 (Wilson) (C) 242, (Russell) (C) 275 312 (A) 329 (P) 338, 400, 402 550, (P) 635 706 762
Nursery School Association courses 550
Nurses—alien (P) 339 cadet corps (P) 605, conditions in nursing service (Edwards) (C) 27 154 29 (Carter) (C) 59 (Carling) (C) 125 (Davidson) (C) 186 (P) 273 341 (P) 368 401 (A) 508, 635 tuberculosis and (Carling) (C) 519, diphtheria immunisation for 637 district, 307 559 exhibition of nursing, 635 for Colonies (P) 402 Instruments Appliances and Theatre Technique (Pearce) (R) 108 married employment of (P) 273 National Service Act and 155 numbers of 19 public health, 307, 342, 559 rubber gloves for 666 see also Accidents Hospitals Medicine and the Law Nurseries and Services
Nutrition—cheese lactic certificates for 671, collective feeding problems, 706, eggs for invalids 24, (A) 389; evaluation of standards 432, grass and (A) 266; heavyweight assessment of (A) 657 in India 512, Ley Farming (Stapledon and Davies) 629 (A) 660 Nutrition and Victory (Pulay) (R) 324 Nutritional Deficiencies (Youmans) (R) 708, of children (Lander and Latsky) 105 (A) 112 (C) 123 155 (Wilson) 199, (Bashford) (C) 239 (A) 265 311 (Paterson) (C) 336 (P) 338 370 (Harris) (C) 399 428, (Ockman) (C) 489 (Feeding of Children from One to Five Years) 503 516, (A) 598 (Harris) 642, 644 (LA) 655 679 746 provision of milk and meals and (P) 25 151, 274 (P) 338 370 399 404 428, (Milligan) (C) 487, (P) 516, 580, (A) 598 (P) 634 706 724 (P) 775 of fats 93 of livestock food and milk supplies and (A) 266 (P) 337 338, (LA) 357, 395 (A) 392 629 (A) 660, 688, of workers (A) 206 206 (Canteens at work) (Gardiner) (A) 268 (P) 400, (A) 480 682 (P) 666 706 on Continent (P) 182 393 (A) 392 (C) 488 (P) 518 (A) 621, 724, survey teams (A) 625 vegetable produce and (A) 147 303 (LA) 477 (A) 598 706 see also Calcium Diet, Food Growth Iron Milk Physical education Social conditions Tuberculosis Vitamins and—
Nutrition national—food policy and (P) 337 338 367 395 (A) 392 (Harris) (C) 399 432 (Ockman) (C) 489 516 (A) 598 625 679 706 housewives on (A) 459 see also Bread, Nutrition and Vitamins
Nutrition of bacteria see Chemotherapy
Nuttall H C W, gastric hæmorrhage (C) 631

O

Oakley W dosage of insulin (C) 633
Obesity see Weight
Obstetrics—Aids to Obstetrics (Williams) (P) 504 extraperitoneal cæsarean section (LA) 591 future of 21 (Kerr) 627 651 hæmorrhage and 162 (A) 176 shock and (Sheehan) 616 Year Book of Obstetrics and Gynecology (DeLee and Greenhill) (P) 682 see also Childbirth Maternity and child welfare and Midwifery
O Carroll J F (O) 370
Occupational therapy see Rehabilitation
Ockman, D jaundiced children (C) 489
Œstrin—antibodies and (A) 540 cancer and, 323 (A) 509 growth new growth and 323, synthetic (A) 18 472 in termination of pregnancy autodetoxication of (Zondek and Bromberg) 351 see also Lactation Menstruation, and Sex hormones

OFFICIAL MEMORANDA —Abortus vaccine (LA) 621 (A) 685—Amputation 669—Bactericides 430—Burns (A) 688, (LA) 709—Dentistry (LA) 449 (A) 687—Diphtheria immunisation (A) 568—Family allowances 607—Feeding of children 503—First aid post equipment 371—Mass radiography (A) 568—Medical man power (A) 111 (LA) 143—Population 663—Scabies 628—Toxic anæmia (A) 327—X rays in manipulating fractures, 55, see also MRC

Old age—Care of the Aged (Geriatrics) (Thewlis) (P) 356 long lived family (Cunnington) (C) 721 mental states in (A) 84, Treatment of Patient Past Fifty (Boas) (R) 534 see also Pensions Population and Vital-statistics
Oliver Sir T death of 626, (O) 665
Oliver W. W Man who Lived for Tomorrow (R) 294
Operations—cardiac and respiratory arrest during (A) 298 (Layton) (C) 366, (Galley) (C) 430 (Draper and Whitehead) 442 Instruments Appliances and Theatre Technique (Pearce) (R) 108 pholedrine at (Dodd) 498 see also Anæsthesia Fluid Medicine and the Law, Sterilisation, Surgery, and Thrombosis
Ophthalmological see Eyes and—
Ophthalmological congress—anæsthesia in ophthalmic operations 754 calcification in hydrophthalmic eye 754 conjunctival tumour 754 fatty changes in ocular tissue 753 glaucoma 754 iris colour changes 754 magnetic particles in vitreous chamber 753 melanotic tumour of iris, 754, papilledema 753 paracentral scotoma 754; retinal degeneration 754 retinitis proliferans 753 sulphonamides in ophthalmology, 753 thrombosis of central vein, 754, vitamins in ophthalmology 754, white ring in cornea 753
Order of St John of Jerusalem—promotions and appointments 54
Orr, Sir J on food production and distribution 395
Orthopædics—non-operative treatment and, 117 Scottish service of, 339 Canadian unit and 87, Year Book of Industrial and Orthopædic Surgery (Painter) (R) 738, see also Injuries Joints and Physical education
Orthoptists register of, 461
Os calcis, see Fractures
Osteitis see Bone
Osteomyelitis of frontal bone sulphathiazole in (Taylor and Walker) 619
Otology, see Ear
Oxygen—anoxæmia test in coronary disease (A) 350 (LA) 388 (Levison) (C) 519, anoxia in airmen (A) 234 713, decompression and (A) 146 see also Anæsthesia Respiration and—
Oxygen therapy—in chest and lung injuries 148, 216, 258, in coronary thrombosis (LA) 388 in phosgene poisoning 316, Pose and Sellors mask (Aitken and Cruickshank) 587 see also Anæsthesia, Respiration, and Shock

P

Page C M middle meningeal hæmorrhage (C) 574
Page, Sir F fellowship for 93
Paige G B sulphonamides and enteric fevers (C) 154
Pagel W, on primary tuberculosis 454
Paget's disease see Bone
Painter, C F Year Book of Industrial and Orthopædic Surgery (R) 738

PALESTINE —Air raids emotional stress and 513 dermatoses and 513 new shelter 513—Appointment 188—Benevolent fund 513—Doctors meetings of with English doctors 513 surplus of 367—Drug supplies 601—Health centre 513—Hospitals air raid shelters, 513 new surgical and dental departments 601 shortage of beds 601 social work, 513—Jewish Medical Association 601—Photosensitising effects of emotional stress 513—Population of ages, 601—Schoenholz Professor, death of 514—Social medicine experiments in 513—War injuries, 513 601

Palsy see Muscles and Nervous system
Pancreatic fistula (Edwards) 137, (Maingot) (C) 213
Pannett C A cotton ligatures 755, peptic ulcer (C) 336
Paper—handkerchiefs (C) 367 see also Salvage
Paracelsus—Four Treatises by Paracelsus (Sigerist) (R) 504
Paraffin liquid (LA) 656 (Burrell) (C) 693, (Twort) (C) 750
Paralysis see Body scheme, Muscles, and Nervous system
Paramore R H shock (C) 430
Paratyphoid fever see Enteric fever
Park, William Hallock biography of (Man who Lived for Tomorrow) (Oliver) (R) 294
Parker, A, on milk as effluent (A) 360
Parkinson G S Jameson and Parkinson's Synopsis of Hygiene (R) 262
Parliament—election, 598, see also—

PARLIAMENT

African Colonies housing in, 606; nursing in, 402—A.R P fire watchers bedding 310 first-aid points 90; shelters 152 183; static water mosquitoes in 576—Aliens doctors 273, 577, nurses 339—Artificial limbs, 245 339 431 634
British Guiana welfare schemes 402—Broadcasts on health 90 518—Budget the 516, 544—Burial delayed, 719
Cambridge dental scheme 634—Children allowances for 431 517, 635, 634 747 care of in war-time nurseries and, 90 152 211, 338, 401 635, 748, 776, delinquent, 245 401, 545; education of 775; evacuation of 90, 431, illegitimate 402, in industry, 243, 273 309 368 400, 401, 431, 457 516 517 545, 577 634 719, in shelters, 152, nutrition of 25 26 151 337 338, 516 634, 775 on land 776 shortage of school doctors, 634—Civilian casualty figures 748—Cut incomes, 748
Delinquency, juvenile 245 401 545—Diathermy apparatus restrictions on, 458—Diphtheria, 152 606 748—Drugs animal medicines 606 dispensing in Services, 152, 518, 606 749, 776, for occupied territories 775 for prisoners of war 775; supply and sale of 152 339, 431, 518, 577, 606, 634

Education medical curtailment of, 545, 748 women students 719—Emergency, priority in, 183—Evacuation, 90, 431
Family allowances 431 517, 633, 634, 747—From the Press Gallery 25, 151, 182, 211 243, 338 367 458, 516, 543, 576, 633, 747 775—Fuel rationing, 605, 605, 747
Gingivitis, 213 337, 338
Hospitals appointments in newly qualified practitioners and 606, coordination of staffs 776, domestic staffs 152, fracture and orthopædic organisation, 89 151, future of 512, 543 maternity, in Scotland 776, medical man power and 211, 212 272 517, 718, mental tuberculosis in 90, 339 635 national loaf and, 152, soldier s death in hospital 545, waiting lists and 245, 458—Housing in African Colonies, 606, post-war 243 575
Industrial medicine children of workers, care of 90 152, 211, 338 401, 635, 748 776, dental care of young workers 545 634, Essential Works Order, imprisonment under youth s death following, 719, eye accidents, 748, prevention and treatment of, 776, factory medical service 211, 212 244 431 457 458, health insurance 273, 309 338, 401, 542 543, 545, 634, hours of work 368, 400, 516, 666, for young persons, 243, 273, 309 368, 400 401 431 457, 516, 517, 577, 719, medical care and, 431, 457, in Trinidad, 635, Irish labourers medical inspection of, 402, 577, lead poisoning 245, 748, medical women and Ministry of Labour staff, 90 miners' health and welfare, 183, 211, 212, 244, 337 368 400, 402, 577 635, 718, 719, 747, 776, pneumokoniosis, 183, 243 244, 273 402 577, 718 719, 747 776, quarantine, man power and, 152, rehabilitation of injured 89, 151, 337, 368 718, 747 artificial limbs and, 431, workmen's compensation 212, 431, 577—Insurance, National Health additional benefits, 545, 634, administration man power and 309, elderly workers and 401, extension of, 542, 543, statistics, 273 women war workers and, 338
Kenya plague in, 26
Man power and woman power, 90, 152 309 338, 605 666, 747 medical, 90, 211 212, 245 272 273 274 517 544, 545 576, 577, 605, 634, 718 748—Maternity services analgesics use of, 748 ex midwives, employment of, 634, in Scotland 25, 309, 776, midwives' salaries, 634—Medical officers of health emergency calls on doctors, 183, sanitary inspectors and whole time of rural district councils, 183—Medical personnel in Ministries, 577—Milk dairy herds, 90 diseases of 577, for invalids, 516, 719, for mothers, young children, and school children 25 26, 337 338, 516, 775, for tuberculosis contacts, 183, pasteurisation of 748, 776—Mosquito control, 576
Nurses alien, 339, cadet corps, 605, for Colonies 402, married, employment of, 273, registration of 183, 339, 518, shortage of, 273, 339, 368, 401 518, 605—Nutrition alternative model budgets 719 bread, war time 26, 89 152, 182 183 213 243 244, 274, 310 337 338 339 367, 431, 517 577 634 666, 748, 776, communal feeding centres, 310, food situation and 337 338, 367, 400 gingivitis and 213, 337, 338 in Europe food-ships and, 182 518, 775 milk and meals for mothers young children and school children 25, 26 151 337, 338 516 634, 775, scientific adviser to Ministry of Food 339 vitamin preparations for children 338, vitamin preparations for prisoners of war, 775, vitamin supplies 152
Old age pensions, 367—On the floor of the House, 24 89, 182, 211 243 272, 309, 337, 367, 400 457, 516, 542, 575, 605, 633, 666, 718 747, 775
Plague in Kenya, 26—Planning town and county, 243, 575—Progress of war 24 89, 182, 309 457, 605, 747
Quarantine man power and 152—Quinine supplies, 431, 634
Red Cross emblem use of 183 606—Rehabilitation of injured, 89, 151 245, 337, 339, 368, 431, 634, 718, 747
Scabies 518, 635—Science government grants for 211 represented in Parliament 211—Scotland age groups 633, 635, hospital waiting lists 458, hospitals, maternity 776, maternity services 25 309, 776, school meals, 25, 151, veterinary research, 183—Services amputations in artificial limbs and, 245, 339 634 camp sewage chalk boreholes and 719, delayed burial of A T S lance corporal 719 dental treatment in 273, 372, 401, dependants' medical care, 26, digestive disorders in 544 634 666, dispensing in, 152, 518, 606 749, 776, dowsing experiment, 457, fitness for overseas 183, gingivitis in, 213, 337, 338 Home Guard, 245, 272, 458, 605, medical board efficiency 245, medical care of, 272, 606 medical man power and 211 212, 245, 272, 273, 274 517, 544, 545, 576, 577, 605, 634 718, 748, medicines for prisoners of war, 775 mental and nervous disorder in, 212, 309, newly qualified practitioners and 606, pensions cases, medical evidence and 212, 273 309, 544, 576, 634, 666, 775, pensions for seamen 775, recruits in 40-50 age group 244 Red Cross emblem use of 183 606 rehabilitation of injured 89, 151 245 339, 634 scabies and, 518 635 soldier s death in hospital 545 tuberculosis in 666, 775 mass radiography and, 244 576, typhus measures against, 152 in British prisoners of war camp, 273 venereal diseases and 577 719 women in, welfare of, 211 243, 309 wound treatment new 402—Shelters children in, 152 medical officers for, 183—Sleepy sickness after imprisonment, 719—Social services expenditure, 458
Tobacco tax, 544—Trinidad public health in, 635—Tuberculosis financial help and 635, in mental hospitals 90, 339 635, in Services, 666, 775, mass radiography and 244 576, priority milk and, 183, 719, recruitment of tuberculosis officers 605, war and, 90, 244 337 338 339 431, 543, 576 605, 635, 666 775, 776—Typhus in eastern Europe 152 precautions against 152, 273 577, statistics of, exchange of, with Soviet, 213
University grants, 309, 368
Venereal diseases, 577 719—Vital statistics 25, 90, 309 common fevers, deaths from, 152 606 748 exchange of, with Soviet, 213, illegitimate births, 402, population trend, 518, 544 633 635, 666 tuberculosis incidence and mortality 90, 337, 338, 339 431, 543 605 635 666 775, 776
Women doctors and dentists exemption of 245, 274 and Ministry of Labour staff, 90—Wood alcohol, 518, 633

Parry, L A temperature taking (C) 632
Parsons C G, gingivitis in Forces (C) 214, (LA) 232
Parsons F B, posture during sleep (C) 91 (A) 178
Parsons, Sir J, and Stallard H B, Diseases of Eye (R) 764
Paterson, D, children's outpatient problems (C) 336
Paterson, R on treatment of cancer, 772
Pathology—Functional Pathology (Lichtwitz) (R) 654, 708 Synopsis of Applied Pathological Chemistry (Andes and Eaton) (R) 764 Text book of Pathology (Muir) (R) 504 *see also* Museum
Patterson W H, paratyphoid B meningitis, 678
Paxon T, on mercurial diuretics (LA) 448
Pearce E Instruments, Appliances and Theatre Technique (R) 108
Pellagra, *see* Vitamin B
Pelvic—dislocation, 118, *see also* Fractures Obstetrics and Peritoneum
Penicillin—(A) 596, (Fleming) 732 *see also* Acne
Penman W J students in uniform (C) 337
Pensions—old age (P) 367, *see also* Services
Peptic ulcer—increased mortality from, war and 190 (LA) 201, 515 pain in (LA) 710, perforated air raids and (Stewart and Winser) 259 (C) 460, (Wilson) (C) 335 (Jennings) (C) 365 573 (Rendle Short) (C) 429 priority milk and eggs for 24, (A) 389 (P) 516 special restaurant meals for 206 surgical and medical treatment of (LA) 295 341, (Pannett) (C) 336, (Nicol) severe hæmorrhage and (Bennett and Wright) 551, (LA) 563 (N (C) 631 (Pickering) (C) 631 (Hu 750 *see also* Abdomen, Perito Services, and Stomach
Peritoneum—intraperitoneal sul mides (Gardiner) 195 (A) 235 (Hudson and Smith) 437, (LA) 564, tetanus and (A) 770 peritoneoscopy (Walker and Playfair) 159, (A) 540 *see also* Abdomen, Intestinal, and Obstetrics
Personality tests, *see* Psychological tests
Pertussis—early diagnosis of (A) 176 immunisation against (Evans) 529, lung complications in (A) 687
Peters, A, on dermatitis in filling factories, 270
Petrol, aspiration of (Cope) 469
Phantom limbs *see* Body scheme
Pharmaceutical Society—156, 187, 555, embryo as patient, 11, 93, research, 724, *see also*—
Pharmacy—future of, report on, 119, *see also* Dispensers, Drugs and Pharmaceutical Society
Phenothiazine death (ML) 86
Philps, A S, intraocular foreign bodies (C) 214
Pholedrine (Dodd) 498
Phosgene *see* Poisoning
Phosphatase, plasma (LA) 14
Phosphorus—excretion of, in thyrotoxicosis and myxœdema (Robertson) 672 radioactive (LA) 326, *see also* Bone Bread and Phytic acid
Photoelectric colorimeter direct reading (King) 511
Physical education—Army centre for (Howitt and Wesson) 373, (Davies) (C) 459 Body Mechanics (Goldthwait Brown Swaim, Kuhns and Kerr) (R) 592 in industry (Davies) (C) 459, 522, inter allied conference 280, 396, *see also* Boxing and Health education
Physical treatment—alleged negligence and (ML) 570 electrotherapy of denervated muscles (Gutmann and Guttmann) 169, hyperpyrexia in gonorrhœa, 652, in cardiovascular diseases 313, (Bach) (C) 399, in peripheral nerve injuries 555, *see also* Rehabilitation and Ultraviolet
Phytic acid—(Bennett) (C) 572, 720 590 (A) 595, (LA) 623, 679, (Bacharach) (C) 780, (Harris) (C) 780 *see also* Bread
Pickering, G W gastric hæmorrhage (C) 631
Pilcher, R S, on wound treatment, 474
Piles, *see* Hæmorrhoids
Pilots *see* Aviation
Pincock A C, injected serum in circulation, 699
Piney A, Sternal Puncture (R) 78
Pink disease (A) 18
Pinkerton, M C, amnioplastin for adherent digital tendons, 70
Pirie N W, on food value of grass (A) 266
Pituitary gland—pitressin in intestinal flatulence (Hurst) 223, (A) 234, post shock metabolism and, 433 Simmonds's disease and (A) 267, stomach and (A) 298 *see also* Hormones and Sex hormones
Plague—pneumonic immunisation against (A) 236, pyrethrum and (A) 714, *see also* Rats
Planning and reconstruction—200 724 Minister of Works and Planning Bill (P) 575 Municipal Year Book (R) 764, *see also* Health services, Hospitals, and R C S
Plasma—iron (A) 81 (Fowweather) (C) 154, (LA) 326 phosphatase (LA) 14 *see also* Blood and Transfusion
Plaster *see* Fractures and Wounds
Plastic surgery, *see* Grafts and Surgery
Platelets *see* Blood
Platt, H future staffing of hospitals, 179, suture material (C) 399
Playfair P L peritoneoscopy 159
Plesch, J, case history in diagnosis (C) 546
Pneumococcal infections—chemotherapy of (Leyshon) 352, (Sakula) 444 (A) 596 686 *see also* Meningitis and Pneumonia
Pneumokoniosis—in coalworkers 85 (P) 244, 747 report on 85 660 689, (P) 719 in fireclay miners liability and (A) 114, in potteries (P) 243 273 in Russia 85, in tin miners (P) 244 on Gold Coast (P) 402
Pneumomediastinum—in newborn (A) 206 lung blast and (Macklin and Macklin) (C) 602, (Montuschi) (C) 722
Pneumonia—chemotherapy of (A) 19 155, 190 (LA) 201 510 639, (A) 686 rash and (Horne) (C) 779 in New York 155 paratyphoid B infection and (Ungar) (C) 125, pneumonia jackets,

pon free 247 vitamin C and (LA) hock [illegible] war and 190 (LA) 201 310 427 and (A) see also Lung Pneumococcal and (C) 27 S[illegible]
[illegible] see Chest and Tuberculosis, pulmonary
Poison gas—charcoal and (LA) 767 eye injuries from (LA) 290 371, (A) 744 Gas Cleansing Stations (Stewart) (R) 446 skin injuries from, 270 see also First aid and—
Poisoning—barbiturate (Fishman) 199 (Spence) (C) 243, phosgene (Steel) 316, (A) 328 pressure and (A) 146, spider bite (A) 361 see also Accidents Contraception Industrial medicine Medicine and the Law and Poison gas
Poliomyelitis organism of (LA) 622
Popliteal aneurysm see Aneurysm
Population—trend of 428 (P) 518 544 (A) 566 627 (P) 633 635 657 663 (P) 666 see also Reproduction and Vital statistics
Postgraduate courses—dermatology, 580, 608 722 mental deficiency, 126 ophthalmology 341 see also Honyman Gillespie and Industrial medicine
Post mortems see Autopsies
Poston, H external genital hypertrophy 384
Postoperative fluids see Fluid therapy
Posture see Physical education and Sleep
Pot A W Difco SS agar in dysentery 677, (LA) 685
Potteries see Industrial medicine
Pouch of Hartmann, see Hartmann's pouch
Poverty see Social conditions
Power Sir D'A, life of material for (Le Fanu) (C) 400
Poynton, F J *Diplococcus rheumaticus* (C) 693
Practice, medical—Sulphanilamide and Related Compounds in General Practice (Spink) (R) 172 see also Health services and—
Practitioners—Irish 754 work of in war emergency 754 Palestine, 513 surplus of 363 rubber gloves for 666, X ray risks and 85 242, 305 366 (LA) 557 (A) 769, see also Biography, E M S Foreign Health services Honours Legal medicine, Medical man power, and Services
Pregnancy—blood viscosity in 162 (A) 176 heartburn and (A) 362 toxæmias of 76 484, see also Abortion Childbirth, Embryo Maternity and child welfare Œstrin Sex hormones and Uterus
Prentice, D percentiles for intelligence (C) 335
Prepositions, superfluous (Lawrence) (C) 215 (Langdon Brown) (C) 243, (Smithard) (C) 243
Pressure gaseous see Gases
Primates—Bibliographica Primatologica (Ruch) (R) 682
Prior A M on blood grouping (A) 509
Prisoners of war see Casualties and Services
Prisons see Legal medicine
Proclamation, new (A) 328
Proseptasine see Chemotherapy
Prostate—cancer of serum phosphatase and (LA) 14, see also Gonorrhœa
Protein see Bread and Nutrition
Prothrombin see Blood and Thrombosis
Psychiatry—Early Treatment of Nervous and Mental Disorders (Neustatter) (R) 416 education in general medicine and (A) 450 Foundations of Neuropsychiatry (Cobb) (R) 142, illegitimate motherhood study of (A) 328, Mask of Sanity (Cleckley) (R) 386, nutritional deficiencies and (A) 712, prognosis of mental instability (Hall and Hall) 376 (Harris) (C) 461 Psychotherapy (Barker) (R) 200 Schroeder P work of (A) 268 Therapy of Neuroses and Psychoses (Kraines) (R) 620 see also Mental disorder Nervous disorder Nervous system Psychology Shock therapy, and—
Psychiatry war—(Cook and Sargant) 31 42, 92 (Raven) 115 153 (Neuroses and Psychoses of War) (Frank) (R) 200 (LA) 201 (P) 212 (LA) 231 (P) 245 (Wilson) 284 (P) 309 311 (A) 330 354 (Hall and Hall) 376 416 (A) 450 (Lewis and Slater) 496 (A) 510 513, (A) 537 (Dillon) (C) 574 614 (Howe) (C) 632 (Slater Sargant and Glen) 676, (LA) 683 709 see also Aviation Head injuries Peptic ulcer Psychiatry and—
Psychological tests—(Slater) 101 (Raven) 115 (LA) 231 311 (Prentice) (C) 335 (A) 510 (LA) 709 sodium amytal and (Slater Sargant, and Glen) 676, (LA) 683, see also Psychiatry
Psychology—course for DPM 462 Diagnosis of Man (Walker) (R) 416 Disease and Social System (Guirdham) (R) 562, (Whitty) (C) 633 educational, appointment in refugee refused (LA) 565 experimental studentship in 126, Letters to Margaret (Faithfull) (R) 108 mentally stimulating and soothing drugs, use of in war (A) 450, (Slater Sargant and Glen) 676, (LA) 683, mothering infant's need for (A) 390, of childbirth (Jones) 695 (Scott) (C) 751, (Foster) (C) 751, of fatigue in Services (A) 234 450 (LA) 683, (A) 713, of night blindness (Sorsby) (C) 123, of pink disease (A) 18 Seasonal Influence on Growth Function and Inheritance (Fitt) (R) 654, Universal Constant in Living (Alexander) (R) 534 War in the Mind (Berg) (R) 294 see also Blood pressure Children Germany, Mental disorder Nervous disorder Psychiatry, Psychological tests Sex and Sleep
Psychoneurosis see Genetics Nervous disorder, Psychiatry and Psychology
Psychosis see Mental disorder and Psychiatry
Psychotherapy see Psychiatry and Psychology
Public health—examinations in 738 Handbook of Hygiene (Bigger) (R) 592, in Cape Town report on 279 in India 512 (LA) 505 Jameson and Parkinson's Synopsis of Hygiene (Parkinson) (R) 262 Manchester's new M O H 19 30 Ministry of Health report, 371 proceedings of local authorities secrecy and (LA) 419 Value of Health to a City (von Pettenkofer) (R) 446 see also Health services Housing Infectious diseases Nurses Nutrition Social conditions Vital statistics and—

PUBLIC HEALTH—Barnsley 580 637—Bedford 428—Brighton 29—Chester 310—Cumberland 427—Derbyshire 310—East Ham 516—East Suffolk 516—East Sussex 427—Exeter 310—Glasgow 10—Hammersmith 516—Hornsey 516—Ipswich 428—Leamington 516—Leeds 580—Leicester 29—London 155—New York 155—Newport 516—Nottingham 59—Preston 22—St Marylebone 516 637—Salford, 516—Shoreditch, 637—Shrewsbury 516—Stockport 580—Tunbridge Wells, 516—Wigan 428—Willenhall 59
Cancer mortality increase in 637—Chemotherapy of cerebrospinal fever 310 pneumonia 155 310 puerperal infection 427—Diabetic fatality rate 425—Diphtheria and diphtheria immunisation 29 516 637—Enteric fever 310 515—Health services New York 155 post war 59—Infant mortality increase in 22, 310 427 516—Intestinal infections in war time 310 515—Milk London 155, sophistication of 637—Pneumonia chemotherapy of 155 310 in New York 155 infantile 310 427 516—Salvage 59—School children health and nutrition of 10 29 155 274 428 516 580 Oslo meals for 274, skin diseases of 10 29 155 580—Sophistication of foodstuffs 637—Tuberculosis statistics 22, 29, 59 155, 310 516—Vital statistics 22 29 59 155 310, 427 428 516 637 population trends, 428, 637

Puerperal infection—(A) 83 sulphonamides and 427 see also Maternal mortality
Pulay E Nutrition and Victory (R) 324
Pullinger B D on mustard gas and eyes (LA) 296, 371
Pulmonary—fat embolism (Scott Kemp and Robb-Smith) 228 354 see also Embolism Lung and Thrombosis
Pyrethrum (A) 714
Pyrexia, see Temperature

Q

Quarantine see Infectious diseases
Quinine—supplies (P) 431 (Nicol and Shute) (C) 545 580 (P) 634, 744 see also Malaria

R

Race R R blood grouping (A) 509 (C) 546
Radford M infection of foodstuffs (C) 215
Radioactive substances—artificial use of in medicine (A) 81 (LA) 326 see also Industrial medicine and Radiology
Radiodermatitis, see X rays
Radiography—aortic injection and (A) 539 of cysticercosis (Brailsford) 127; property in radiograms (ML) 118, see also Fat-embolism Pneumokoniosis, Tuberculosis pulmonary X rays, and—
Radiology—Diagnostic Roentgenology (Golden) (R) 324 386 postwar reconstruction in 772, Twining Memorial (C) 58 Year Book of Radiology (Waters Firor, and Kaplan) (R) 200 (Ardley) (C) [illegible] see also Radioactive Radiography, Radiotherapy and X rays
Radioscopy, mass see Tuberculosis pulmonary and X rays
Radiotherapy—in cancer 46 61 247 323 563 (A) 389 422 701 754 (A) 768, 772 in warts negligence and (ML) 457 London school of (A) 508 Medical Research Council unit 247 medical supply of radon (Russ) (C) 336, Sheffield centre for 466 see also Cyclotron Keloid and Radiology
Radium see Radiology and Radiotherapy
Radon see Luminous paints and Radiotherapy
Ramsay G C on Ross Institute's work in India 512 (LA) 505
Ramsay W A sulphamethazine, 659 (A) 686
Randolph C R and Walker W F, School Health Services (P) 108
Rats—control of (Hardy) 158 (Hume) (C) 276, rat virus for human enteritis and 158 (McLachlan) (C) 489 (Leslie and Elton) (C) 573 mice and historical records of as spreaders of plague (A) 568, see also Plague and Typhus fever
Raven J C testing mental ability, 115, (LA) 231
Reavell I A drying plasma and serum (C) 667
Reconstruction see Planning
Record 1 (Cunnington) (C) 721
Recruits see Psychiatry war and Services
Rectum—Carcinoma of Rectum (Norbury) (R) 12 see also Hæmorrhoids and Intestinal
Red cell see Anæmia, Blood, and Hæmorrhage
Red Cross see Hospitals
Refugees see Foreign
Regimental see Army
Registrar General see Population and Vital statistics
Rehabilitation—in burns 410 in rheumatism occupational therapy physical treatment and, 128 (A) 390 Universal Constant in Living (Alexander) (R) 534 see also Injuries Miners, Physical and Tuberculosis
Reid H on foreign bodies in lung 216
Reid, J O, convalescent treatment 278
Reid J W, cardiac ischæmia, 313, (LA) 388
Relapsing fever—(Stannus and Bendit) 103 (Neligan) (C) 215 (Mackenzie) (C) 275 in East Africa 217 see also Lice
Renal see Glycosuria Kidney and Urinary
Rendle Short, J perforated peptic ulcer (C) 429
Reproduction—fertility national loaf and (A) 566 net reproduction rate (P) 666 see also Obstetrics, Population Sex and Vital statistics
Research—Ella Sachs Plotz Foundation, 156 future of (Burrows) (C) 57 (Goodall) (C) 153, Lady Tata Memorial Trust 371 782 see also Cancer Medical Research Council, and Pharmaceutical Society
Respiration—diving and (A) 146, failure of in newborn (A) 206 602 posture and during sleep (Rigden) (C) 215 lung expansion and (MacMahon) (C) 242 respirators in diphtheritic paralysis 29 (Todesco) 261 (Begg) (C) 534, see also Anæsthesia Lung Oxygen Poison gas and—
Respiratory infections—face masks and, 301 (LA) 387 infant mortality and 310 427 516, paper handkerchief shortage and (C) 367 see also Cross-infection Lung Nose Shelters, and Throat
Retractor improved curvlite (Wakeley) (NI) 12
Rheumatism—117 campaign against 128 occupational therapy in (A) 390 see also Gonorrhœa Sciatica and—
Rheumatism juvenile—*Diplococcus rheumaticus* and (Copeman and Stewart) (C) 603 (Poynton) (C) 693 vitamin C and (LA) 655 see also Heart disease
Rhinology see Nose
Richards R L sympathectomy in aneurysm 383

Richardson, J S, serratus magnus palsy, 618
Rickets, *see* Bone, Calcium and Vitamin D
Rickettsial infections—149, 425, (Findlay) 483, *see also* Typhus fever
Riddoch G on phantom limb (LA) 201
Rigden, B G, posture during sleep (C) 215
Road accidents—Birmingham Accident Hospital and (A) 204, *see also* Injuries
Robb Smith, A H T, pulmonary fat embolism, 228 354
Robertson, J D calcium excretion in thyrotoxicosis, 672
Robertson, W A (O) 578
Robinson, G E, intraocular foreign bodies (C) 123
Robinson M on breast feeding (A) 538
Rockefeller Foundation—studentships (A) 268
Rocyn Jones, A, on Paget's disease of bone, 117
Roentgenology, *see* Radiology
Rogers, L, movement of foreign bodies (C) 399
Rogers, Sir L, and Megaw, Sir J, Tropical Medicine (R) 230
Rolleston, Sir H and Moncrieff A A, Disorders of Blood Pressure (R) 324, Modern Therapeutics (R) 386
Rose and Sellors mask *see* Oxygen therapy
Ross J N M, migration of foreign body, 704
Ross Institute—report of India branch, 512, (LA) 505
Roux, P (O) 777
Rowbotham, G F, Acute Injuries of Head (R) 738
Rowbotham S, introducer for spinal needles (NI) 734
Royal Air Force, *see* Aviation and Services
Royal College of Nursing—presidential election, 723 *see also* Nurses
Royal College of Obstetricians and Gynæcologists—election, 550, fellows 550 members 187, 550, membership regulations, 422, pass list, 461
Royal College of Physicians of Edinburgh—fellows, 206, licences, 156 549
Royal College of Physicians of London—appointment, 187 conjoint regulations, 550, diplomas, 94, 187, 247, 370 461 491 579, 753, elections, 579, fellows, 579, Harveian oration 343 licences, 187, 579, members, 187 579, presidential election 461
Royal College of Surgeons in Ireland—Carmichael prizes, 671, elections 753
Royal College of Surgeons of Edinburgh—fellows, 638 694 licences, 156, 549
Royal College of Surgeons of England—appointments, 94, 247, 370 491, 753, Buckston Browne lunch, 247, conjoint regulations, 550 diplomas, 94, 187, 247, 370 461 491 638 753 elections, 247 312, (C) 488, 491, 638 753, fellows (A) 52 93, 491 hospital recognised, 638, lectures, 60 86, 247, 341, 433 579 668, 723, medal, 753, medical portraits (Le Fanu) (C) 153, prizes 94, 491, 753 restoration of, assistance in (A) 17 84, 94, (LA) 144, 218, 247, 522
Royal Faculty of Physicians and Surgeons of Glasgow—fellows 90, 723, legacy, 723 licences, 156, 549
Royal Institute of Public Health and Hygiene—Harding, A S retirement of, 422
Royal Institution, 156
Royal Medical Benevolent Fund (Barlow) (C) 58 693, 588 668
Royal Sanitary Institute, 156, 218, 491 668
Royal Society—fellows, 400
Royal Society of Arts—341 milk production and consumption 341, 608, (A) 660 war time nutrition, 341, 550, (A) 598, 625
Rubber gloves, 666
Rubbo S D, mode of action of sulphonamides, 36, (LA) 47
Rubie, J, renal glycosuria with hypoglycæmia (C) 241
Ruch T C, Bibliographica Primatologica (R) 682
Rusby N L, migration of foreign bodies (C) 460
Russ, S, medical supply of radon (C) 336
Russell Sir A, on Scottish diphtheria campaign, 339
Russell, B sulphonamides and enteric fevers (C) 242
Russell, Sir J on food production and distribution 396
Russell, J J F (O) 461
Russell, V, war time nurseries (C) 275
Russell W R on cerebral œdema, 262
Russia—dust diseases in, 85, exchange with, of medical information (P) 213, (LA) 263, microscopes for 492 surgical instruments for (Webb Johnson) (C) 275, (LA) 263
Ryan V G, and Jessner L, Shock Treatment in Psychiatry (R) 356, 446
Ryle, J A, on health of war worker, 662

S

Sachs, H, blood grouping, 473, nullity action and (C) 721
Sakula, A, pneumococcal meningitis, 444
Saline, *see* Fluid therapy
Salivary glands, accessory, hyperplasia of, 404
Salmonella—isolation of (LA) 685 meningitis (Ungar) (C) 125, (Patterson) 678, *see also* Enteric fever, Food poisoning and Rats
Salvage—59, paper (A) 17, 51, 59, 341, (A) 509, 549, instrument catalogues and, 87, (C) 276
Samson, E, Facing the Facts, 572
Samuels, H, on workmen's compensation (ML) 269
Sanatorium, *see* Tuberculosis
Sargant T FMS surgeon's libel action (C) 124
Sargant W, neurosis simulating organic disorder, 31 (LA) 231, sodium amytal and intelligence test scores, 676, (LA) 683
Scabies, *see* Skin
Scarborough, H, on vitamins and hæmorrhage, 248
Scarlet fever—chemotherapy in (A) 266, *see also* Streptococci
Scharlieb, Dame M, Change of Life (R) 356
Schick test, *see* Diphtheria
Schiller, F, middle meningeal hæmorrhage, 532
Schizophrenia, *see* Mental disorder
Schlesinger B E, sulphonamides in impetigo, 527
Schoenholz Professor, death of, 514
School children — clever, chance for (Audric) (C) 404 health and nutrition of, 10, 155 404 428, 516 (Harris) 642 644, (LA) 655, 746, provision of milk and meals and (P) 25 151 274, (P) 338, 404, 428 (Milligan) (C) 487, (A) 598, (P) 634, 706 724 (P) 775, Oslo meals for 274, (A) 598 quarantine regulations and (P) 152, *see also* Children, Health education, Physical education, Skin, and—
Schools—School Health Services (Walker and Randolph) (R) 108, *see also* Juvenile delinquency, Nurseries, Nurses, and School children
Schroeder, P, death of (A) 268
Schulenburg C A R, corrosive stricture of stomach (C) 276
Schuster N H, bacterial contamination of cerebrospinal fluid (C) 124
Sciatica 140, (LA) 144, (Symonds) (C) 186, 213, 752
Science—Development of the Sciences (Woodruff) (R) 230, Government grants for (P) 211, history of, manual worker and (A) 626, Science and Human Prospects (Blackwelder) 462, Science for the Prosecution (Grant) (R) 112 scientific film conference, 782, *see also* Biography and Germany

SCOTLAND (*see also* Universities)—Age groups (P) 633 635—Burns, treatment of memorandum on (A) 688, (LA) 709—Canadian orthopædic unit, 87—Diphtheria campaign, 339, 452, (P) 606—Edinburgh public medical service 90—Honyman Gillespie lectures, 84 248 279, 372, 461, 484 608, 752—Hospitals 87, 339 (A) 659, burns treatment (A) 688, (LA) 709 mental 340, nomenclature and, 485, postwar policy, 94, waiting lists 121—Hostel camps 579—Intestinal obstruction, acute, 279—Maternal mortality (P) 25—Mental disorders 340, nomenclature stigma and 485—Neurosurgical unit (A) 659—Nursing committee, 29—Œstrogenic therapy, 372—Orthopædic service 87 339—Pregnancy, toxæmias of 481—Professional organisation 121—School meals (P) 25 151—Spinal cord surgical lesions of 752—Students report on medical education (A) 151—Tuberculosis 87 280—Vitamins and hæmorrhage, 248—Workshops health in, 87

Scott, J C, on congenital dislocation of hip, 118 pulmonary fat embolism, 228
Scott, T F M, herpes simpl 232, 761
Scott, W L, psychology (Hurst) (C) 751
Seamen, *see* Services
Sears, W G glandular fever with granulocytopenia, 703
Seasonal Influence on Growth Function and Inheritance (Pitt) (R) 654
Seddon H J, deodorising cloth for plasters, 755, (LA) 767, on peripheral nerve injuries, 591
Seidlitz powder, 65 years of (Cunnington) (C) 721
Selwyn Clarke, P S, on medical services in Hong Kong (A) 19
Semilunar cartilage, *see* Internal cartilage
Serratus magnus palsy (Richardson) 618
Serum transfusion, *see* Transfusion
Services—Anæsthetics Afloat (Woolmer) (R) 592, appointment, 60, blood pressure, emotion and in candidates (Butler) (C) 26, 61, (Nixon) (C) 91, delayed burial of A T (P) 719, dental treatment in (P) 273 372, (P) 401, dispensing in (P) 152, 518, 606, 749, 776, dowsing experiment (P) 457 520 dyspepsia in (Brockbank) 39 (Maingot) (C) 124, (Bull) (C) 185, (Smellie) 322 (P) 544, (Spira) (C) 631, (P) 634, 666 (Gill, Berridge, and Jones) 727, (LA) 740, efficiency of medical boards (P) 245, evasion of service, 735 fatigue in (A) 234, 450, (LA) 683, (A) 713, frost bite, trench foot and immersion foot in (LA) 47, gingivitis in (Stuhl and Coventry) (C) 153, (P) 213 (Parsons) (C) 214, (LA) 232, (Stuhl) (C) 276 (P) 337, 338, (Stammers) (C) 574 (LA) 655, Home Guard medical service (P) 272, (C) 545, Home Guard, recruitment of (P) 245, honours and awards, 60 94, 156, 178, 280, 312, 341, 462, 522, 606, 668, 746, (A) 742, 781, 782, hospital, maternity, for soldiers' wives, 754, march hæmoglobinuria in (A) 204, mass catering in, 706, medicine chests (Thompson) 548, pensions (P) 212, 273 309 544, 576, 634 666, for seamen (P) 775 physical development centre for (Howitt and Wesson) 373, (Davies) (C) 459, pictorial hygiene for, 62, recruits in 40–50 age-group (P) 244 scabies and (P) 518, 635, serving practitioner's debts (ML) 269, sewage from camp, chalk boreholes and (P) 719, soldier's death in hospital (P) 545, soothing and stimulating drugs for (A) 450 (LA) 683, students and 271 (LA) 264, (C) 307, (Penman) (C) 337, (Comfort) (C) 337, (A) 392, (C) 489, (Fendall) (C) 547, tuberculosis in (P) 666 694 mass radiography and, 248, (A) 568, (P) 576, (Trail) 609, (LA) 655, (A) 714, V A D members and (C) 778, women doctors and, 156, (C) 215, (Stewart) (C) 487, (LA) 477, women's Services, health and welfare of (P) 211, 243 309, 694, *see also* Army Medical Service Aviation, Casualties, Dispensers, EMS, Injuries, Medical man power, Psychiatry, war Psychological tests, Typhus, and Wounds
Severn, A G M, anthrax septicæmia, 9
Sewage, *see* Water supplies
Sex—balance of (A) 479 Happy Marriage (Himes) (R) 294 Parents Problem (Ladell) (R) 356, Sex Problems and Youth (Tucker) (R) 200, taboo and, 456, 515, (Faint) (C) 547, (Walker) (C) 375 (Wilson) (C) 667, *see also* Reproduction and—
Sex hormones—external genital hypertrophy and (Poston and Barber) 384 luteotrophic hormone (LA) 387, methyl testosterone (A) 567, 633 migraine and (Leyton) (C) 488 (Muslin) (C) 546, *see also* Œstrin, Pituitary gland and Sex
Shackle, J W, agranulocytosis (C) 306
Sharp, B B, whole man (C) 751
Sharpey Schafer E P, injected serum in circulation, 699
Shaw, F, on maternity and child welfare 21
Sheehan, H L blood transfusion for obstetric hæmorrhage, 616
Shelters—health in (A) 329, (LA) 387 641, medical aid posts, closure of 641 new shelter in Palestine 513, shelter foot (LA) 47 *see also* Infant mortality
Shock—(LA) 18, (A) 265 (Dunlop) (C) 334 (Layton) (C) 366 (Galley) (C) 430 (Paramore) (C) 459 (Walther) (C) 519, heat and (A) 598 metabolic response after (Cuthbertson) 433, obstetric hæmorrhage and transfusion in 162 (A) 176, (Sheehan) 616 *see also* Burns Injuries, Operations and Transfusion

hock therapy—apparatus for 430, curare and (A) 420, jaw control in (Haldane) (C) 27 Shock Treatment in Psychiatry (Jessner and Ryan) (R) 356, 446 sub-convulsion therapy (Frossard) (C) 400, (Gould) (C) 520
Shoulder joint—arthrodesis of (A) 742, recurrent dislocation of 118
Shute, P G, economy in quinine (C) 545, 580
Sigerist H E Four Treatises by Paracelsus (R) 504, Value of Health to a City (von Pettenkofer) (R) 446
Silicosis, see Pneumokoniosis
Simmonds's disease tests for (A) 267
Simpson K, air accidents during transfusion, 697
Simpson S L dosage of insulin (C) 489
Sinusitis in children (A) 687
Skin—acne (Cohen) 168, 270, (Craddock) 558 cleavage lines, 440 (A) 451 diseases of, in school-children 10, 29, 155, 241, (LA) 325 522, 580, 628, emotional stress and 513, impetigo, 10 29 580 sulphonamides in (A) 422 (Schlesinger and Martin) 527 (Steigman) (C) 632, postgraduate lectures on, 580, 608, 722 scabies 10 29 (Forman) (C) 241 (LA) 325, 342, (P) 518 522 580 628, (P) 635 723 sulphonamide rash (Horne) (C) 779 see also Burns, Disinfectants Industrial medicine Insects Mycoses, Staphylococcal Streptococci, Wounds and X rays
Skull see Head injuries and Intracranial
Slater, E neurosis in soldiers, 496
Slater P percentiles for intelligence quotients 101 (LA) 231, sodium amytal and intelligence test scores 676 (LA) 683
Sleep—posture during (Leak) (C) 26 (Parsons) (C) 91 (Holt) (C) 124 (Bates) (C) 186 (A) 178 (Rigden) (C) 215, (MacMahon) (C) 242 see also Somnambulism
Sleeping sickness see Trypanosomiasis
Sleepy sickness see Encephalitis
Smart, T F M not so sterile water (C) 27
Smell see Charcoal and Wounds
Smellie J M gastric disorders in Army 322
Smith, E J R on tetanus 77
Smith F B, on bone marrow specimens, 354
Smith F L (O) 308
Smith G S sulphamethazine, 639 (A) 686
Smith, J on surgery in desert (LA) 766
Smith, P H on Simmonds's disease (A) 267
Smith, P intraperitoneal sulphanilamide 437
Smith P H (O) 308
Smithard E P H superfluous prepositions (C) 243
Smoke abatement, 397, (A) 537, (Martine) (C) 632
Smoking see Tobacco
Sneezing see Respiratory infections
Social conditions—Christian Democracy (Temple) 462 Disease and Social System (Guirdham) (R) 562, (Whitty) (C) 633 family allowances 607 (P) 633 634 747, illegitimate motherhood study of (A) 328 manual worker status of history of scientific progress and (A) 626 Medicine and Mankind (Sorsby) (R) 12, New Facts on Mental Disorders (Dayton) (R) 108 Proceedings of National Conference of Social Work 128 see also Biology Health services Industrial medicine Public health, Tuberculosis and Vital statistics
Socialist Medical Association—frustration of medicine 638 (A) 713, health of war worker 662 (LA) 711

SOCIETIES, MEDICAL

ASSOCIATION OF CLINICAL PATHOLOGISTS—Anaphylaxis 354 burns, fibrin membranes for 354 endometrium preparations of 354, fat-embolism 354, head injuries blood changes after 354 malignant cells, sputum films of 354 miliary tubercles in bone marrow 354, paraganglioma in bone marrow 354 *Plasmodium ovale* films 354, prothrombin estimation 354, sternal puncture films 354 urea fermentation test 354
ASSOCIATION OF INDUSTRIAL MEDICAL OFFICERS—Industrial dermatitis 126 269
BIOCHEMICAL SOCIETY—187, 550 (LA) 623 668
BRITISH ORTHOPÆDIC ASSOCIATION—403, carpal scaphoid fractures of 118, elbow-joint ossification around, 118 hip joint arthritis of 117, hip joint, congenital dislocation of 118, leg compound fractures of, 118 non operative treatment in orthopædic surgery 117 Paget's disease of single long bone, 117 pelvic dislocation, 118 presidential election 187 shoulder joint, recurrent dislocation of 118
EX SERVICES WELFARE SOCIETY—Neurotic war casualties, 247, 351
FACULTY OF RADIOLOGISTS—60, 341 668 postwar reconstruction in radiology 668 772 Twining Memorial (C) 58
GLASGOW MEDICO CHIRURGICAL SOCIETY—218
HARVEIAN SOCIETY OF LONDON—Harveian lecture 191, 581
HEBERDEN SOCIETY—Heberden medal 464
LONDON ASSOCIATION OF MEDICAL WOMEN'S FEDERATION—462
LONDON JEWISH HOSPITAL MEDICAL SOCIETY—94, 432, 668
MANCHESTER MEDICAL SOCIETY—Industrial medicine, 568 ulcerative colitis 753
MEDICAL SOCIETY FOR STUDY OF VENEREAL DISEASES—278 638 731, compulsory powers 491 561, gonococcal arthritis and rheumatism 652
MEDICAL SOCIETY OF LONDON—668, amputation 522 669 return to work, 247 533 war burns 370 410
MEDICAL SUPERINTENDENTS SOCIETY—218 432
MEDICO LEGAL SOCIETY—92 239, 367, 608 divorce for insanity (LA) 593
NATIONAL ASSOCIATION FOR PREVENTION OF TUBERCULOSIS—Coöperation with other anti tuberculosis organisations (LA) 655, memorandum, 248 (LA) 357
NUTRITION SOCIETY—Collective feeding 555 638 706 food production and distribution 218 247 395, (A) 392 food requirements for health 432 standards evaluation of 432
OPHTHALMOLOGICAL SOCIETY OF UNITED KINGDOM—Anæsthesia in ophthalmic operations 754 calcification in hydrophthalmic eye, 754 congress, 260 522, 753, conjunctival tumour, 754, election, 753, fatty changes in ocular tissue 753, glaucoma 754, iris colour changes, 754 magnetic particles in vitreous chamber, 753 melanotic tumour of iris 754 papill œdema 753 paracentral scotoma 754, retinal degeneration 754 retinitis proliferans 753 sulphonamides in ophthalmology 753 thrombosis of central vein, 754 vitamins in ophthalmology, 754 white ring in cornea 753
OXFORD GRADUATES MEDICAL CLUB—782
PADDINGTON MEDICAL SOCIETY—312
ROYAL ACADEMY OF MEDICINE IN IRELAND—Phytic acid and iron absorption (A) 595
ROYAL MEDICO PSYCHOLOGICAL ASSOCIATION—217 272, 608
ROYAL SOCIETY OF MEDICINE—Sections of Epidemiology 301 454—Medicine (A) 265 679—Neurology 10 140 (LA) 144 213 262 (A) 420 591 705—Obstetrics and gynæcology 627 651 696—Orthopædics, 140 (LA) 144 213 —*Physical medicine, 652*—*Psychiatry* (A) 510 660—State medicine 559—Study of diseases in children 170 (A) 687—Surgery, 77, (A) 265 323 474
Subjects of discussion Anæsthesia, regional 77 avulsed tissue replacement of 77 cerebral œdema, 262 cross infection 301 474 epilepsy traumatic 705 gonococcal arthritis and rheumatism 652 growth, new growth and 323, head injuries 10 170 262 (A) 420 705 intellectual capacity (A) 510 lung disease 454 chronic in children (A) 687, maternity services 627 651 696 mineral and vitamin requirements 679; obstetrics future of 627 651 696 peripheral nerve injuries 591 psychoneuroses heredity of (A) 660; public health nursing 559 sciatic pain 140 (LA) 144, 213 shock (A) 265 sympathectomy, endothoracic, 77, tetanus in London sector, 77, tuberculosis primary in adults 454, urinary diastase in acute abdomen, 77 wound treatment 77 (A) 265 301 474
Report on louse-borne typhus fever, 60 scholarship 608
SOCIETY OF MEDICAL OFFICERS OF HEALTH—668 antitoxins improved 310, 681 chronic lung disease in children (A) 687, presidential election 660
TUBERCULOSIS ASSOCIATION—187, 550 724, coöperation of, with other anti-tuberculosis organisations (LA) 655, rehabilitation of tuberculous, 187, 403, (A) 419, 550, 716

Society for Relief of Widows and Orphans of Medical Men 491 608, 723
Society of Apothecaries of London—appointment 461 diplomas 60 218, 312, 461, 608, 694, lecture, 734, pass list, 723
Society of Chemical Industry (A) 266
Sodium amytal, see Psychological tests
Sodium, radioactive (LA) 326
Sodium sulphapyridine see Sulphapyridine
Soldiers, see Services
Soluseptasine—in otitis (Beatty) (C) 633 in pneumococcal meningitis (Levshon) 352 in pneumonia rash and (Horne) (C) 779 see also Chemotherapy
Somerville T V (O) 369
Somnambulism (Davis, Hayes, and Kirman) (C) 156
Sorley E R (O) 341 607
Sorsby A Medicine and Mankind (R) 12 night-blindness (C) 123
Spaeth F B Principles and Practice of Ophthalmic Surgery (R) 78
Speculum see Vaginal speculum
Spemann H death of (A) 146
Spence, A W barbiturate poisoning (C) 243
Spence J W, zinc peroxide preparations, 7 (LA) 418
Sphagnum 641
Spider bite (A) 361
Spillane J D anosognosia and finger agnosia 42, (LA) 201
Spinal—cord surgical lesions of 752 see also Anæsthesia Bladder, Cerebro-spinal and Nervous system
Spink W W, Sulphanilamide and Related Compounds in General Practice (R) 172
Spira J J, gastric disorders in Army (C) 631
Spira L mottled teeth 649
Spirit see Alcohol
Splenic artery, see Aneurysm
Splints see Fractures and Injuries
Staccato sentences 562 (Whitty) (C) 633
Stallard H B and Parsons, Sir J Diseases of Eye (R) 764
Stammers A. F, gingivitis (C) 574
Stannus H S, beriberi, 736, relapsing fever 103
Staphylococcal infections—chemotherapy of (Jackman and Martin) 135 (Flowers Collins and Hardy) 470 (A) 480 (Taylor and Walters) 619 (A) 686 food poisoning and (Dorling) 382, septicæmia and (Jackman and Martin) 135 (Flowers, Collins and Hardy) 470 (A) 480 see also Cross infection Penicillin, and Skin
Stapledon Sir G and Davies W Ley Farming 629 (A) 660
Starlings foot-and mouth disease and (A) 596
Steel J P phosgene poisoning 316
Steell G death of 84 (O) 157
Steigman A J herpes simplex virus (LA) 232 761 sulphonamides in impetigo (C) 632
Sterilisation—technique faulty, in spinal puncture and anæsthesia (Smart) (C) 27 (Schuster) (C) 124 (Hewer and Garrod) (C) 275 see also Cross infection Disinfectants, Surgery and Transfusion
Sternal see Transfusion and—
Sternal puncture—354, (A) 626, Sternal Puncture (Piney) (R) 78, see also Anæmia
Stevenson D L piles (C) 91
Stewart C medical women with Forces (C) 457, (LA) 477
Stewart D N, perforated peptic ulcer, 259, (C) 460
Stewart H M (O) 461
Stewart H T (O) 692
Stewart L Gas Cleansing Stations (R) 446
Stewart M (O) 340
Stewart O W neurogenic bladder 287
Stewart W *Diplococcus rheumaticus* (C) 603
Stilbœstrol see Œstrin
Stocki, W (O) 490
Stocks P vital statistics 189, (LA) 201
Stomach—bismuth and (A) 145, corrosive stricture of (Schulenburg) (C) 276 heartburn and in pregnancy (A) 362 heat cold and (A) 624 pancreatic

fistula implanted into (Edwards) 137, (Maingot) (C) 213, posterior pituitary gland and (A) 298; *see also* Gastro intestinal, Peptic ulcer and Services
Stomatitis, *see* Gingivostomatitis
Stopes, M C, volpar products (C) 58
Stout, W, antiseptic emulsions in burns, 347
Strain R E, transfusion sites, 61
Streptococci—groups B, C and G (A) 83, poliomyelitis and (LA) 622 sulphonamide resistant (Francis) 408, (LA) 418, (A) 596, *see also* Cross infection, Erysipelas Heart disease Puerperal, Rheumatism, Scarlet fever, Skin, and Throat
Streptococci, nutrition of, *see* Chemotherapy
Students—compulsory medical examination of (A) 420 vitamin C levels of (Harris) 642 644, (Francis and Wormall) 647, (LA) 655, *see also* Dental and—
Students medical—board and lodging of, 492 Diseases of Eye (Wolff) (R) 504, library facilities for (Charatan) (C) 694, (Cassels) (C) 722, on medical education (A) 451, Rockefeller studentships for (A) 268, *see also* Education medical, Services, Students, and Universities
Stuhl F gingivitis in Forces (C) 153, (LA) 232, (C) 276
Subconvulsion, *see* Shock therapy
Submarine escape accidents (A) 146
Subungual hæmorrhages *see* Myalgia
Sulphadiazine—(LA) 621 (A) 686, in burns (A) 566, *see also* Chemotherapy
Sulphaguanidine—fæcal concentration of (Hawking) 290 704, in dysentery 20 (Hawking) 290, *see also* Chemotherapy
Sulphamethazine (Macartney, Luxton Smith, Ramsay and Goldman) 639, (A) 686
Sulphanilamide—(A) 686, diffusion of (Lum) 585 estimation of (Fuller and Colebrook) 760, in burns (Francis) 408, (LA) 418, *505* (A) *596*, in enteric fevers (Page) (C) 154 in meningococcal endocarditis (Cutts Krafft, and Willcox) 292, in nasal diphtheria (Boissard and Fry) *610* *in* peritonitis 704, local application and (A) 235 (Hudson and Smith) 437 in scarlet fever (A) 266, in wound infections (LA) 14 302 305 (Francis) 408, (LA) 418, (Lum) 585 (A) 596, (LA) 621, (James) (C) 694, 725, (LA) 766 streptococci resistant to (Francis) 408 (LA) 418, (A) 596, *see also* Chemotherapy
Sulphapyridine—(A) 686 agranulocytosis and (Cross) 9 chronic lung conditions and (A) 687, in enteric fevers (Muller) 104, (C) 336, (Page) (C) 154 (Russell) (C) 242, (Davies) (C) 307, (Patterson) 678 in gonorrhœa (Laird) 463 (Fairbrother, Aymer, and Ashton) 464, (LA) 478, in meningococcal infections (Watts) 168, (A) 178, (Banks and McCartney) 219 (Cutts Krafft, and Willcox) 292, in paratyphoid B meningitis (Patterson) 678, in pneumococcal meningitis (Levshon) 352 (Sakula) 444, in pneumonia (A) 19 155, (A) 686, rash and (Horne) (C) 779, in wound infections (LA) 621 (A) 686 725 (LA) 766, intraperitoneal (Gardiner) 195 (A) 235 tetanus and (A) 770, overdose of sodium sulphapyridine (A) 19, *see also* Chemotherapy
Sulphathiazole—(A) 686, applied near brain, epilepsy following (Watt and Alexander) 493, in enteric fevers (Davies) (C) 307, (Patterson) 678 in meningococcal encephalitis (Banks and McCartney) 219, in meningococcal endocarditis (Cutts, Krafft, and Willcox) 292 in osteomyelitis of frontal bone (Taylor and Walters) 619, in paratyphoid B meningitis (Patterson) 678 in staphylococcal septicæmia (Jackman and Martin) 135, (Flowers, Collins and Hardy) 470, (A) 480 in wound infections (A) 482, (Watt and Alexander) 493, (LA) 621 intraperitoneal (A) 235 *see also* Chemotherapy
Sulphonamides, *see* Chemotherapy
Suprarenal *see* Adrenal
Surgery—cleavage lines and 440, (A) 451, neurosurgical unit, Scottish (A) 659 plastic surgery film 188, (Gillies) (C) 213, Principles and Practice of Ophthalmic Surgery (Spaeth) (R) 78 (Robinson) (C) 123 Rôle of Liver in Surgery (Boyce) (R) 416 Russian war (LA) 263 suture and ligature materials (A) 329, 347, (Platt) (C) 399 (Davies) (C) 399 (Hindmarsh) (C) 429 (Bonnin) (C) 460 (Pannett) 755; Year Book of General Surgery (Graham) R) 386 *see also* Casualties Disinfectants, Hospitals, Injuries, Instruments, Legal medicine, Operations, Orthopædics, and Shock
Sutures *see* Surgery
Swaim, L T, Goldthwait, J E, Brown, L T, Kuhns J G, and Keir, W J, Body Mechanics (R) 592
Sweany, H C Age Morphology of Primary Tubercles (R) 262
Sydney Ringer lecture, 312
Symonds, C P on postcontusional state (A) 420, sciatic pain, 141, (C) 186
Sympathectomy—endothoracic 77 lumbar in popliteal aneurysm (Richards and Learmonth) 383
Syphilis—adequate treatment of (LA) 684 congenital syphilis and (Nabarro) (C) 778, cardiovascular (A) 360, 383 (LA) 684, 778, presenting as psychological disturbances, 614, transfusion and (A) 508, 581, *see also* Venereal disease

T

Tansley K, *cod liver oil for wounds, 95*
Tata Memorial Trust, 371, 782
Tavistock Clinic 579
Taylor, G L, blood grouping (A) 509, (C) 546
Taylor, G N, sulphathiazole in osteomyelitis, 619
Taylor, H H (O) 692
Taylor, R G on pelvic dislocation, 118
Teaching *see* Education medical
Teall C G, on reconstruction in radiology, 772
Teeth—fluorosis and (Murray and Wilson) 98, (Spira) 649 of adolescents, 53 (P) *545, 572, (P) 634,* (A) 687, of children, 53, (Murray and Wilson) 98, 572, 649, (A) 687 of recruits (P) 273 372, (P) 401, Your Teeth (Brekhus) 53, (Tomey) 53, *see also* Bites Calcium, Dental, Mouth, and Phosphorus
Teleky, A, medical graduation at Cambridge, 63
Temperament, *see* Psychology
Temperature—artificial hyperpyrexia in gonorrhœa 652 frost bite and allied conditions (LA) 47, heat and cold, gastro intestinal responses to (A) 624, taking of (Parry) (C) 632, *see also* Aviation Car and Shock
Temple W Christian Democracy 462
Tetanus—after local chemotherapy (A) 770, in London sector, 77
Theatre, *see* Operations
Therapeutics—Modern Therapeutics (Rolleston and Moncrieff) (R) 386 Textbook of Medical Treatment (Dunlop Davidson, and McNee) (R) 416, *see also* Drugs and Old age
Thewlis, M W Care of the Aged (Geriatrics) (R) 356
Thomas, J C S, tellurite medium in dysentery, 321
Thompson C J S naval and military medicine chests, 548
Thompson, G S, improved Clover s inhaler (NI) 324
Thoracic, *see* Chest and Sympathectomy
Threadworms, *see* Phenothiazine
Throat—Diseases of Nose, Throat and Ear (Hall) (R) 386 Manual of Otology Rhinology and Laryngology (Ballenger) (R) 682, sore myalgia and (Houghton and Jones) 196, (A) 205 tonsil melanoma of, 61 tonsillectomy, considerate, basal narcosis and (Gerrie and Mackenzie) 759 (LA) 765 Year Book of Eye Ear, Nose and Throat (Bothman and Crowe) (R) 592 *see also* Cross infection Respiratory infections and Streptococci
Thrombin *see* Blood Hæmorrhage and—
Thrombosis—of central vein, 754 of leg veins (A) 82 139 318 pulmonary embolism and (A) 82, 139, synthetic anti prothrombin in (Lehmann) 318, *see also* Coronary and Intracranial
Thrower, W R, zinc peroxide (C) 489
Thrush—(LA) 232 (Duncan) 393, in maternity hospital (Ludlam and Henderson) 64
Thyroid gland—calcium and (A) 113 phosphorus and (Robertson) 672 plasma phosphatase and (LA) 14 radio active iodine and (LA) 326 *see also* Simmonds s disease and—
Thyrotoxicosis—planned treatment of (LA) 263 (Joll) (C) 334 *see also* Thyroid gland
Tidy, H L regimental medical officers (C) 57
Tissue, avulsed *see* Grafts
Tobacco—amblyopia (A) 451, (Gott (C) 547 tax (P) 544
Todesco, J M, diphtheritic diaphragmat paralysis, 261
Toe, *see* Foot
Tomey, E V, dental caries, 53
Tonsil *see* Throat
Top F H, Handbook of Communicable Diseases (R) 476
Trail R R, miniature mass radiography in RAF, 609
Training *see* Physical education
Transfusion—addition of glucose to stored blood (Bono and Willder) 139 circulatory disasters and (Whitby) 581 drying plasma and serum (Wilkinson Bullock, and Cowen) 281 (Reavell) (C) 667 intramedullary (A) 769, malaria and (Whitby) 581, plasma, in hospital ship (Wolfe and Clegg) 191 (LA) 505, pyrexial reaction and (Whitby) 581 granulocytosis and (Cross) 9, renal failure and (LA) 79, 581, retention of serum (Sharpey Schafer, Wallace, and Pincock) 699 sites for (Strain) 61, syphilis and (A) 508, (Whitby) 581 *see also* Blood, Blood groups Casualties, Embolism, Hæmorrhage, Injuries, and Shock
Trauma, *see* Injuries and Wounds
Treatment, *see* Therapeutics
Trichiniasis—515, freezing, trichinæ and (A) 510 *see also* Myalgia
Trichlorethylene, *see* Anæsthesia
Tropical Medicine (Rogers and Megaw) (R) 230
Trost, A H anæsthetic flowmeters (C) 92
Troup, R (O) 636
Truex R C Morton, D J and Kellner, C E, Human Cross Section Anatomy (R) 108
Trypanosomiasis—in French Congo, 458, *see also* Chagas's disease
Tuberculosis—Age Morphology of Primary Tubercles (Sweany) (R) 262, cooperation of three anti tuberculosis organisations (LA) 655 in Cape Town, 279, in Ireland 121, in mental hospitals (P) 90 339, 635 in nurses (Carling) (C) 519, in Scotland, 87, 280 in women registrants, 694 micro culture method in (A) 81 microscopy, fluorescence, of bacilli (A) 147 miliary tubercles in bone marrow, 354 primary, in adults 454, recruitment of tuberculosis officers (P) 605 rehabilitation schemes and (A) 119, (LA) 655, •716 Varrier Jones memorial lectures (A) 508, war and 22, 29, 59 87 (P) 90, 123, 155 156 190, (LA) 201, 280, (LA) 297, (P) 337 338, 339, (LA) 357 (P) 431 454 516, (P) 543, (A) 568 (P) 576 605, (Trail) 609 (P) 635, 666 694, (A) 714 716, anti tuberculosis campaign and (LA) 109, 248, (LA) 655, *see also* Aneurysm, Milk, and—
Tuberculosis, pulmonary—mass X ray examination for (LA) 109 (Hall) 161, (Ellman) *(C) 242, 366, 248, (LA) 297,* (Brailsford) (C) 305, (Jones) (C) 306, (P) 339, (LA) 357, (A) 420, (Carling) (C) 519, (A) 568, (P) 576, (Trail) 609, (LA) 655, (A) 714, 716, neurasthenia and 614, *pneumothorax in the home* (Aslett and Jarman) (C) 123, Story of Clinical Pulmonary Tuberculosis (Brown) (R) 78, *see also* Pneumokoniosis
Tucker T F, Sex Problems and Youth (R) 200
Turpentine, *see* Ear
Twining Memorial (C) 58
Twins *see* Mongolian
Twort, J M *liquid paraffin (C) 750*
Typhoid fever *see* Enteric fever
Typhus fever—allied diseases and *149,* 425, 483, immunisation against (P) 152, 270 (P) 273 371, 425, (Findlay) 483, (LA) 506 in British prisoners of war camp (P) 273 *in East Africa* 217, information on, exchange of, with Russia (P) 213 (LA) 263 on Continent (P) *152, 273, 371,* 425 442, *(LA) 506, (P) 577,* 650, *763* precautions against in Britain 156, (A) 235, 270, (P) *273, 577,* *see also* Lice Rats, and Weil Felix reaction

U

Ultraviolet light, *measles and (A) 391*
Undulant fever *see* Abortion contagious
Ungar, J, salmonella meningitis (C) 125

UNITED STATES—Ambulances work of, in Britain (A) 17, 218—American College f Surgeons gift to Royal College of Surgeons (A) 84 94 (LA) 144—Child mortality (A) 743—Commonwealth Fund eport (A) 391—Finlay Institute of Americas (A) 562—Health services 128 155 (Administrative Medicine) (Emerson) (R) 356 386 (A) 508 559 (A) 712—Hospital census (A) 712—Nursing service (A) 508 559—Proceedings of National Conference of Social Work 128—Psychiatric selection (LA) 231 (A) 537—Rockefeller studentships (A) 268—St Louis encephalitis and equine encephalomyelitis (A) 51—Surgery at Pearl Harbour (A) 482

Universal Constant in Living (Alexander) (R) 534
Universities—grants to (P) 309 368 medical graduation at Cambridge (Greenwood and Teleky) 65 *see also* Education medical Students medical and—

UNIVERSITIES—Aberdeen graduation 484, vacation term 484 694 (A) 712—Birmingham industrial medicine course, 322—Cambridge appointment 280 degrees 187 218 370, 579 608 694 723 753 Linacre lecture 409 medical graduation at (Greenwood and Teleky) 63 pass lists 29 341 prize 247—Dublin appointment 341, degrees 432, pass list 491—Edinburgh, appointment 638—Glasgow degrees 549 medals 549 postgraduate course 341—Leeds industrial medicine course 550 pass lists 29 432—Liverpool pass lists 29, 432—London appointments 579 curriculum curtailment of 782, degree 782 fellowship 312 grant (P) 368, pass lists 60 694 survey of, in war time (A) 624 teachers recognised, 491 title conferred 782—Manchester pass list 549—National University of Ireland appointments, 370, 694 elections 370—Oxford degrees 29, 187, 312 341 608, pass list 126—Queensland 715—Sheffield health test for undergraduates (A) 420, pass list, 132—Wales pass list, 156

Unregistered practitioner (ML) 689
Ureteric *see*—
Urinary tract—damage from sulphonamides, 639, (A) 686 infection 354 chemotherapy of (A) 686 ureteric calculi (A) 298, *see also* Bladder Kidney Prostate and—
Urine—bacilli in urea fermentation test and 354 diastase in acute abdomen and 77 march hæmoglobinuria (A) 294, polyuria, nocturnal heart failure and (Leak) (C) 26 (A) 178 *see also* Calcium Kidney Sex hormones Urinary, Vitamins and Water metabolism
Uterus—cancer of 363 charcoal blanket and (Alstead) 669, (LA) 767, endometrium, preparations of 354 fibroids hæmorrhage from methyl testosterone and (A) 567 *see also* Menstruation Obstetrics Pregnancy and Sex hormones

V

Vaginal speculum Sims illuminated (Walters) (NI) 78
Varicella *see* Chickenpox
Varicose veins *see* Veins
Varrier Jones memorial lectures (A) 508
Vaughan A C T epidemic paratyphoid, 133 (LA) 173 341 (LA) 685
Vegetables *see* Nutrition and Vitamins
Veins—varicose ligature and injection for (A) 73 varicose ulceration and (A) 51 *see also* Hæmorrhoids, Intravenous and Thrombosis
Venereal disease—control of compulsory powers and 561 in Cape Town 279 in East Africa 217 *see also* British Social Hygiene Council, Gonorrhœa and Syphilis
Vermin *see* Insects and Rats
Veterinary—diagnosis (Carmichael) (C) 519, (Plesch) (C) 546 service Russian microscopes for 492 *see also* Cattle and Nutrition
Viruses—cancer 323 (A) 509 catarrhal jaundice (LA) 80 chickenpox (A) 659 lymphocytic choriomeningitis 714 (LA) 741 pink disease (A) 18 poliomyelitis (LA) 622 *see also* Encephalitis Herpes and Yellow fever
Vital statistics—22 29 59 (P) 90 155 310 371 427 428 516 637 in Palestine 513 601 in United States 155 (A) 743 of second year of the war (Stocks) 189 (LA) 201 sex incidence of diseases (A) 479 *see also* Infant mortality, Infectious diseases Maternal mortality Population Public health Reproduction and Tuberculosis
Vitamin A—eyes and (Sorsby) (C) 123 (A) 451 680 694 for pharmaceutical preparations reduction in use of 132 hæmorrhage and 248 vegetables and (A) 147 (LA) 177 (A) 598 *see also* Bread, Cod liver oil and Vitamins
Vitamin B—diabetes and (Kodicek) 501 eyes and (A) 451 (Gottlieb) (C) 547 680 694 hæmorrhage and 248 in vegetables conservation of 303 nerve injuries and (A) 743 nicotinic acid renamed (A) 597 nicotinic acid requirements (Kodicek) 380 395 pink disease and (A) 18 psychiatric disorders and (A) 712 standardisation of (LA) 536 tests for deficiency (Wilson) 199 (A) 265 341 380 *see also* Beriberi Bread Gingivostomatitis and Vitamins
Vitamin C—black currant and rose hip preparations and 56 122 (A) 112 311 (Loewenfeld) (C) 311 (Paterson) (C) 336 (P) 338 370 capillary fragility hæmorrhage and (Munro Lazarus and Bell) 648 (LA) 655 vitamin P and, 248 for Finland 56 oxidation reduction indicator and, 293 saturation tests optimal requirements and (A) 265 (Harris) 642 644 (Francis and Wormall) 647 (LA) 655 679 706 transported meals and (Milligan) (C) 487 vegetables and (A) 147 303 (A) 598 706 *see also* Gingivostomatitis and Vitamins
Vitamin D—hæmorrhage and, 248, standardisation of (LA) 536 *see also* Cod liver oil Teeth and Vitamins
Vitamin E—standardisation of (LA) 536, *see also* Bread
Vitamin K—hæmorrhage and 248 (A) 451 481 (Macpherson and Henderson) (C) 546 (Capon) (C) 602, (Collis) (C) 632, *see also* Thrombosis
Vitamin P capillary fragility and 248
Vitamins—for children Government scheme and (A) 112, 311 (Paterson) (C) 336 (P) 338 370, (A) 598 requirements of war time dietary and 679 standardisation of (LA) 536 supplies of for pharmaceutical purposes (P) 152 *see also* Eyes and Nutrition
Volpar *see* Contraception
V A D *see* Services
von Diringshofen H Medical Guide for Flying Personnel (A) 713
von Pettenkofer M, Value of Health to a City (P) 446

W

Wadsworth G M (O) 403
Wakeley C P G burns, 410 (LA) 505 (C) 575, improved curvlite retractor (NI) 12
Walker K Diagnosis of Man (R) 416 sex and taboo (C) 575
Walker R M peritoneoscopy, 159
Walker W F, and Randolph C R School Health Services (R) 108
Wallace J injected serum in circulation 699
Walter W G on traumatic epilepsy 705
Walters A H, sulphathiazole in osteomyelitis 619
Walters, G A B, illuminated Sims vaginal speculum (NI) 78
Walther W W dosage of insulin (C) 306, shock (C) 519
War—fuel rationing and (P) 605 (LA) 595 (P) 747 medical history of (LA) 13 *see also* Air raids Casualties China Drugs Industrial medicine Injuries, Insects Man-power Nutrition Paper Planning Psychiatry, war Public health Services Tuberculosis Typhus Vital statistics and Wounds
Wards *see* Cross infection and Hospitals
Water—not so sterile (Smart) (C) 27 (Schuster) (C) 124 275 581; *see also* Water supplies and—
Water metabolism—in Addison's disease (A) 205 *see also* Fluid therapy and Kidney
Water supplies—camp sewage chalk bore holes and (P) 719 milk waste and (A) 360 *see also* Air raid precautions Enteric fever and Fluorosis
Waters, C A Firor W B and Kaplan I L, Year Book of Radiology (R) 200
Watson Sir M on malaria control 782
Watt, A C epilepsy following sulphathiazole 493
Watts A S, chronic meningococcal infection, 168
Webb Johnson Sir A surgical instruments for Russia (C) 275 (LA) 265
Weber F P agnosia of hemiplegia and of blindness 44 (LA) 201 encephalopathia arteriolosclerotica basalis lethargica 503 middle meningeal hæmorrhage (C) 604
Weight—assessment of heavyweight (A) 657 *see also* Nutrition
Weil Felix reaction—limitations of (A) 118 (Felix) (C) 335 *see also* Typhus fever
Weiss S (O) 678
Wentworth J F on preservation of specimens (A) 267
Wesson A Army physical development centre 373
Wheatmeal bread, *see* Bread
Whigham J R M Introduction to First Aid (R) 416
Whitby G S on chemotherapy 188
Whitby L F H transfusion 581
Whitehead R W resuscitation after overdose of anæsthetic 412
Whitman R fracture of femoral neck (C) 57, 578 (C) 519
Whitteridge D effects of blast 252 (A) 328
Whitty C W M staccato sentences (C) 633
Whooping cough *see* Pertussis
Who's Who 152
Widdowson E M mineral absorption from white and brown bread 588 (LA) 623
Wilkinson F C on supply of dentists (LA) 449
Wilkinson J F drying plasma and serum 281, liver extracts (C) 240
Wilkinson S F Emergency Medical Service (C) 58 (LA) 145
Willcox P H meningococcal endocarditis 292
Willder J F C addition of glucose to stored blood 139
Williams, I G carcinoma of male breast 701
Williams, L Aids to Obstetrics (R) 504
Williams, R, food borne epidemics 129 (LA) 175
Willius F A Cardiac Clinics (P) 738
Willway F W, on prefrontal leucotomy 86
Wilson A Addison's disease 762
Wilson A C sex and taboo (C) 667
Wilson A K, perforated peptic ulcer (C) 335
Wilson, D C dental fluorosis and caries, 98
Wilson G S on diphtheria immunisation (LA) 417
Wilson H mental reactions to air raids 284
Wilson H E C pyruvic acid test 199 (A) 265
Wilson J G war time nurseries (C) 242
Wilson K (O) 246
Wilson, P on arthritis of hip joint 117
Wilson, R histoplasmosis 224
Wilson R M British Medicine (R) 172
Wind *see* Intestinal
Winser, D M de R. perforated peptic ulcer 259 (C) 460
Winslow C F A Housing for Health (R) 200
Witney, P N (O) 403
Wolfe H R I plasma transfusion in hospital ship 191 (LA) 505
Wolff E Diseases of Eye (R) 504
WAAF, *see* Services
Women's Parliament 120 185 (A) 329
Wood G E C (O) 92
Woodruff L L Development of the Sciences (R) 230
Woolmer R Anæsthetics Afloat (R) 592
Workmen *see* Industrial medicine Injuries and—
Workmen's compensation—(P) 577 Accidental Injuries (Kessler) (R) 172 artificial limbs provision of (ML) 238 363 (P) 431; medical referees (P) 212 operation refused by workman (ML) 238 363 Trauma and Disease (Brahdy and Kahn) (R) 504 works doctor and (ML) 269, *see also* Industrial medicine and Pneumokoniosis
Wormall, A vitamin-C survey 647 (LA) 655
Worsley, R C (O) 692
Wounds—abdominal (LA) 766 animal and human bites (A) 452 chemotherapy

of (LA) 11, 302, 305, (Francis) 408, (LA) 418, 474 (A) 482, (Watt and Alexander) 493, (Lum) 585, (A) 596 (LA) 621, (A) 686, (James) (C) 691, 725 (LA) 766, (A) 769 closed plaster treatment of 305, 474, (A) 482, (Fruchaud) 725, (LA) 766 deodorising cloth and (Seddon and Florey) 755, (LA) 767, cod liver oil and related substances for (Dann Glucksmann, and Tansley) 95, diffusion of sulphanilamide acriflavine, and gentian violet (Lum) 585, excision adequate, importance of, 302 474 (A) 482, 513, 585, (Fruchaud) 725 755, fibroblast reaction and (LA) 739 first principles of treatment, 474, glass (LA) 14 188, Pathology and Treatment of War Wounds (Wright) (R) 738 research on treatment (A) 769, vitamin C and (LA) 655, zinc peroxide for (Hoyle Spence, and Faulkner) 7, 305, (LA) 418, (Thrower) (C) 489, (A) 769 zipp for (Connell) (C) 30[illegible], *see also* Amputation, Casualties Cross infection, Disinfectants, Foreign bodies Grafts, Hæmorrhage, Injuries, Keloid Shock, and Surgery

Wright Sir A, Pathology and Treatment of War Wounds (R) 738
Wright H D epidemic paratyphoid 133, (LA) 173 311, (LA) 685
Wright, H P stickiness of platelets (C) 58
Wright, N on food supplies for man and animals, 39
Wright, S gastro duodenal hæmorrhage, 551, (LA) 563
Wylie W G on intracranial injuries in childhood 171

X

X rays—investigators' risks from, 242, 305, 366 (LA) 357, (A) 769, in manipulation of fractures, precautions against, 85, *see also* Radiography, Radiology, and Radiotherapy

Y

Yellow fever (LA) 175, 217, 458
Yellowlees D (O) 607
Yellowlees, H, neurosis simulating organic disorder (C) 92
Youmans J B Nutritional Deficiencies (R) 708
Young J A K, Hayes splint (C) 62
Young W F postoperative fluids for children 523 (LA) 535

Z

Zinc peroxide preparations (Hoyle, Spence, and Faulkner) 7, 305 (LA) 418, (Thrower) (C) 489, (A) 769
Zipp *see* Wounds
Zondek, B, autodetoxication of stilbœstrol, 381
Zuckerman, S, effects of blast, 252, (A) 328

CONCORDANCE

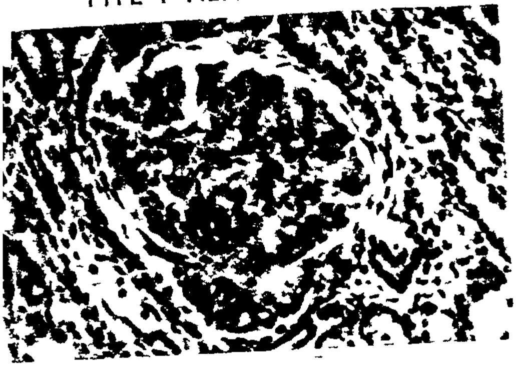
To enable the reader to determine at a glance the date and serial number of the issue of THE LANCET containing the required page reference

Pages	Date of Issue		No	Pages	Date of Issue		No	Pages	Date of Issue		No
1– 30	Jan	3	6175	281–312	Mar	7	6184	523–550	May	2	6192
31– 62	,,	10	6176	313–342	,,	14	6185	551–580		9	6193
63– 94	,,	17	6177	343–372	,,	21	6186	581–608		16	6194
95–128	,,	24	6178	373–404	,,	28	6187	609–638	,,	23	6195
129–158	,,	31	6179	405–432	April	4	6188	639–668	,,	30	6196
159–188	Feb	7	6180	433–462	,,	11	6189	669–696	June	6	6197
189–218	,,	14	6181	463–492	,,	18	6190	697–724	,,	13	6198
219–248	,,	21	6182	493–522	,,	25	6191	725–754	,,	20	61[illegible]
249–280	,,	28	6183					755–782	,,	27	6200

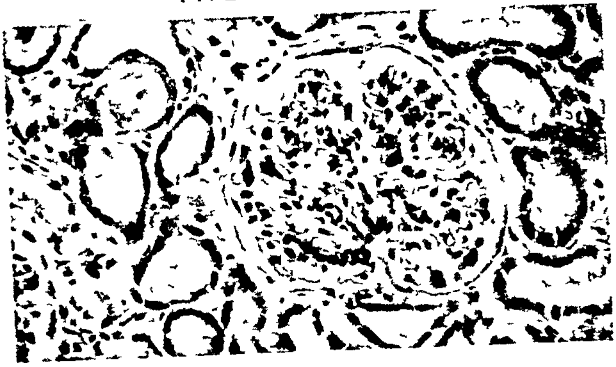
PUBLISHED by the PROPRIETORS, THE LANCET LIMITED, 7, Adam Street, Adelphi, in the County of London
Editorial Office Address, 26 Temple Street, Aylesbury, Bucks (Aylesbury 315)
Printed by HAZELL, WATSON & VINEY, LTD, London and Aylesbury —Saturday Oct 10 1942
PRINTED IN GREAT BRITAIN—Entered as Second Class at the New York U S A, Office

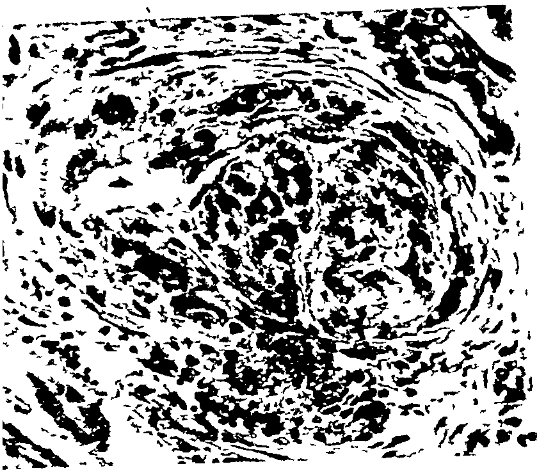
TYPE I NEPHRITIS

TYPE II NEPHRITIS

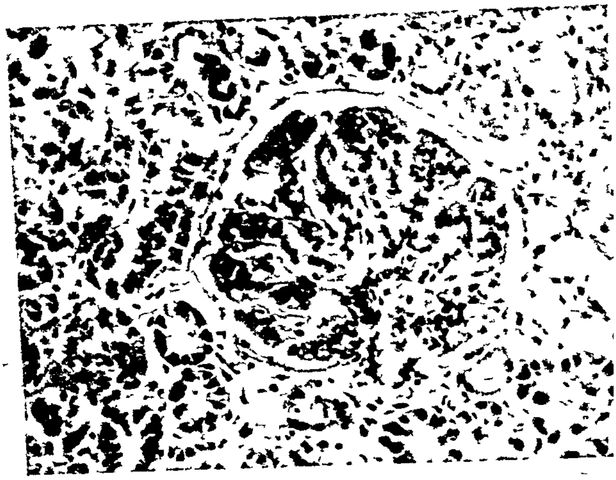


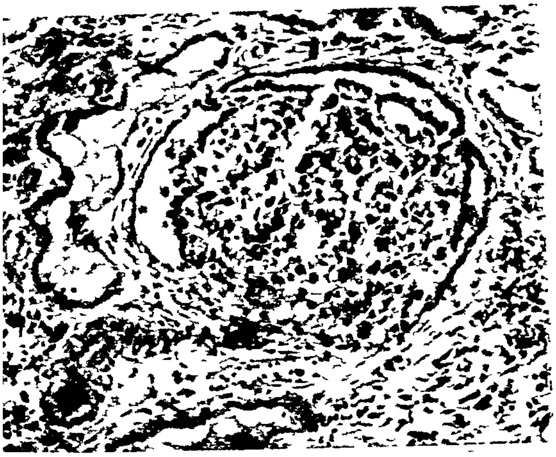
5



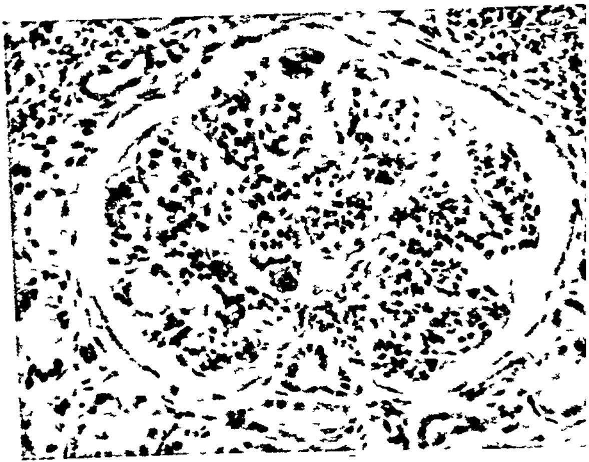


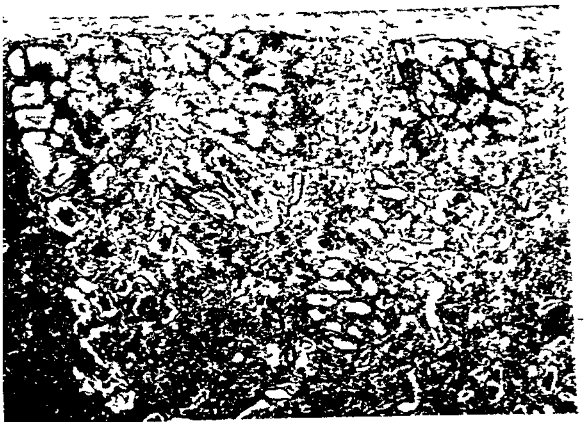
6



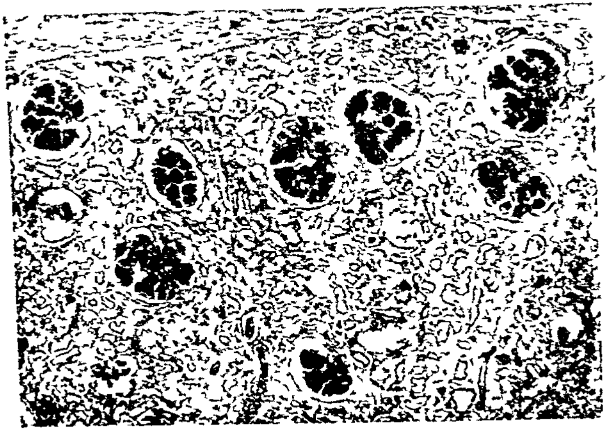


7





8



Legends to the illustrations are given on the preceding page or even decades later with hypertension, renal failure and contracted kidneys

Recovery is the normal course It occurred in 82% of the cases seen within the first fourteen days of the onset of the disease In 131 cases with a history of less than a week on admission the recovery-rate was 88 5% When the patient is put to bed, kept warm and given a restricted diet, improvement usually begins at once Pitting œdema usually disappears within seven days, but diuresis and weight loss often continue for another week The hypertension usually diminishes more slowly, but as a rule the blood-pressure is within normal limits within the first fourteen days Gross hæmaturia, as indicated by the guaiac reaction, has usually disappeared when the blood-pressure becomes normal, but microscopic hæmaturia may persist for another week or more Albuminuria is still more persistent, but in cases that are going to recover a rapid reduction in the amount occurs during the first seven to ten days, a cloud of albumin may persist for several weeks or even months before eventually disappearing In our experience these recoveries are complete Albumin disappears from the urine and the patient shows no more tendency to hypertension or to further renal trouble than normal people On the other hand persistent albuminuria, if not orthostatic, is in our opinion always an indication that the disease is progressive

Death in the acute stage occurred in 7 cases (4%) of our series In 3 it was due to the preceding infection, and and in one to acute heart-failure The remaining 3 died in uræmia with severe oliguria, and histologically the kidneys showed intense glomerular and arteriolar lesions

Rapidly progressive course —In these cases the œdema, hæmaturia and hypertension persist and indeed increase in intensity Renal function progressively deteriorates, and without any subsidence of symptoms the patient dies with hypertension and renal failure within weeks or months from the onset of the disease This is the subacute nephritis of Volhard, the stormy type of Lohlein Although 23 such cases have been observed, we had only 7 examples (4%) among our cases with less than fourteen days history on admission

Slowly progressive course —In this type of case the patient appears to be recovering, but albumin persists in the urine and in some instances the blood-pressure remains a little above normal This is the most chronic form of nephritis It is the " chronische Nephritis mit sehr langsamer Verlaufsart," the " vaskular Typus " of Volhard The patient eventually dies with hypertension and renal failure, but only after a period measured in years or even decades, during which time he is usually in good health though albumin is always present in the urine. In our series, 18 (10%) patients with acute nephritis were left with such residual albuminuria Owing to the long duration we have not been able to observe the whole course of the disorder in this group of patients from its onset to the termination in uræmia We have, however, a number of patients, admitted with hypertension and uræmia, in whom a history of acute nephritis occurring many years previously was obtained Most of these had not complained of symptoms during the long interval

We have had the opportunity of studying in the later stages one patient who had an attack of acute nephritis in the London Hospital in 1899 During the acute attack she had what was obviously hypertensive encephalopathy, and she was treated by Dr Cecil Wall, then a house-physician, with rectal injections of hypertonic saline This patient was seen periodically from this time until her death with hypertension and uræmia in 1938 *She remained in good health*, but albumin was always present in the urine Hypertension was present on repeated examinations from 1914 until her death twenty four years later Apart from headaches, there is no mention of any symptoms attributable to her nephritis until six years before her death, when she began to complain of dyspnœa on exertion

There is good reason to believe that many patients who present with albuminuria and subsequently die with uræmia and hypertension belong to this group, even though they give no history of acute nephritis The acute attack may have been subclinical or may have been forgotten, but occasionally such patients recall the finding of albuminuria many years previously on ro examination for the Army or for life insurance young adults dying with uræmia, in whom contr kidneys are found at autopsy, belong to this group, the histological picture is identical with that seen in cases giving a history of a preceding acute neph Such cases loom large in a clinic of Bright's disea constitute 15% of our patients This is due not to commonness of this chronic course but to its very duration

PROGNOSIS

The four courses outlined above give a general of prognosis in this type of nephritis It will be that 82% made a complete recovery, 4% died in the stage, 4% ran a rapidly progressive course to within a period of months and 10% apparently be chronic A good prognosis depends mainly on treatment If we compare cases admitted wit week of the onset with those having up to a m history on admission, the recovery-rate falls from 90% to 66% , and the most important factor in trea is rest, absolute rest, reinforced by a restriction fluid intake to a pint of orange-juice daily A nephritis should be treated on the same lines as a carditis , if this were done I am certain that the num of chronic cases would diminish

Suppression of urine is a bad prognostic sign fi because cases showing it may have particularly sev lesions in the kidney , secondly because there is dan of a vicious circle, consisting of nitrogen retenti vomiting and dehydration, leading to oliguria a further (extrarenal) nitrogen retention, which I th may prove fatal in cases which might well have recove from the renal lesion

Severe preceding infection and heart-failure are amo the chief causes of death in the early stages, and therefore obvious factors affecting prognosis Persisten of the hypertension, hæmaturia and œdema are omino signs of impending chronicity and indicate that it vital to persist with rigorous treatment We have se *patients recover when hypertension and hæmatu* have persisted for over two months Finally, persisten of albuminuria after acute nephritis does not necessar indicate a chronic course, for in many instances su albuminuria is shown to be orthostatic.

ACUTE FOCAL NEPHRITIS

A small group of patients present with hæmaturia bu without the hypertension and œdema found in acut type 1 nephritis Moreover their hæmaturia occurs a the height of an acute infection, such as tonsillitis o otitis media, instead of after an interval of a week o more Volhard and Fahr applied the term acute focal nephritis to this condition The prognosis is good and the patient usually recovers as soon as the acute infection clears up Occasionally there are repeated attacks of hæmaturia associated with recurrence of the acute infection , there were such recurrences in 11 out of 3 cases in our series In 2 patients albuminuria persisted between the attacks, and after many years the blood pressure gradually rose and death occurred in renal failure We have not included these 35 cases in the group of type 1 nephritis

SUMMARY

Type 1 nephritis is a disease of abrupt onset as a rule there is a history of preceding infection, an hæmaturia is nearly always present Most cases recove completely if adequately treated, but death may occu in the acute stage, or the disease may run a rapidl progressive course to death in a period of months I other instances the acute manifestations subside but persistent albuminuria remains and the patient die with hypertension and uræmia decades after the acut attack

Type 2 Nephritis

Since type 1 nephritis is an acute disease from whic recovery is the rule it is not surprising that 80% of ou patients with this condition were seen within ten day of the onset of their illness Type 2 nephritis, on th other hand, is a disease of insidious onset in which th symptoms are persistent and recovery exceptional In such circumstances it is obvious that a much smalle proportion of cases will be seen early in the disease Thus of 145 cases of type 2 nephritis studied, only 45 (31%) were seen within a month of the onset of œdema Our description of the onset and early stages of the condition is drawn from these cases It must be emphasised that although in this series the ratio of type 1 to type 2 nephritis is 3 2 this does not accurately reflect the relative incidence of the two conditions Type 1 is much more common than type 2 nephritis, the apparent frequency of the latter in this series being due to its chronicity, and to selective hospital admission Many cases of type 1 nephritis are not admitted to any hospital whereas most cases of type 2 nephritis seek admission to hospital at some stage in their illness and will do so in greater numbers to a hospital in which there is known to be a clinic specially dealing with Bright's disease

The problem of nephrosis must be discussed before we pass to a consideration of type 2 nephritis This term was suggested by Friedrich Muller to indicate "degenerative" lesions of the kidney as opposed to the "inflammatory" lesions of nephritis It is used by pathologists for a number of different conditions which have in common tubular degeneration It has, however, also been used in a more narrow sense, sometimes with a prefix such as "lipoid" or "chronic," for those cases with œdema and gross albuminuria in which hæmaturia, hypertension and impaired renal function are absent during life and inflammatory changes in the kidney are lacking or slight at autopsy I do not think that this conception of nephrosis as a separate entity is justified In our experience if the patient with so called "nephrosis" does not die in the early stages and does not recover, he ultimately becomes indistinguishable from a patient with type 2 nephritis Again, if we examine cases dying in the early stages there is a steady gradation in the histological picture from so called nephrosis to type 2 nephritis Moreover, some cases which are clinically nephrosis show the histological changes of type 2 nephritis, while conversely some patients whom we should recognise clinically as type 2 nephritis during life are found at autopsy to have the histological picture of nephrosis In my opinion, the essential differentiation is not between nephrosis and nephritis, but between type 1 and type 2 nephritis, and if the separation is made at this point the cases of so called nephrosis fall naturally into place with other examples of type 2 nephritis Included in our series of type 2 nephritis are therefore some 12 cases which on both clinical and histological grounds would be called nephrosis by many observers

The age-distribution of type 2 nephritis, at the onset of œdema, is shown in table II Although half the cases occur between the ages of 10 and 30, the remainder are scattered throughout the whole age-period It is notable that a third of our patients were over 40 The age-distribution is notably different to that of type 1 nephritis, which is preponderantly a disease of children and young adults Males and females were roughly equal in number in the cases seen within a month of the onset In those first seen in the chronic stage (with more than a year's history of œdema) females exceeded males in a ratio of 4 1, which would suggest that a slowly progressive course is more common in women

A history of preceding infection was obtained in only 3 of the 45 cases seen within the first month after onset of œdema, and in these its relationship to the onset of the nephritis was doubtful, the interval in 2 of the 3 being six weeks and two months This is in striking contrast to type 1 nephritis in which a history of preceding infection was obtained in 84% of cases It is possible that the absence of history of preceding infection is explained by the interval between the onset of the disease and the appearance of symptoms, but the whole course of the disease is so different from that of type 1 nephritis that its different origin can hardly be doubted

CLINICAL PICTURE

The onset is insidious Swelling is the first and often the only symptom It is usually first noticed in the feet but may be very extensive, unlike the œdema of type 1 nephritis, which normally disappears in a few days, it is persistent Although œdema is the presenting symptom, and is nearly always the cause of the patient consulting the doctor, it does not necessarily indicate the real onset of the disease, there is probably always preceding alb[illegible]a, and the evidence available suggests that this may be of long standing We have 9 examples of type 2 nephritis in which examination of the urine happened to be made before the onset of the œdema, in these albumin was found in the urine five years, three years, one year (2 cases), six months, four months and one month (2 cases) before the occurrence of œdema Œdema then is the outstanding symptom of type 2 nephritis Other symptoms which may sometimes be present in the early stage are shortness of breath, "bilious attacks," lassitude and weakness, backache, frothy urine and oliguria, hæmaturia is only rarely noticed

On examination there is often gross œdema which tends to be generalised, effusions into the serous cavities were present in 17 of the 45 early cases Owing to the œdema the patient may appear pale and plump though anæmia is not usually present, and in spite of the apparent plumpness wasting is common and may be severe The skin is often dry and may show loss of normal elasticity The blood-pressure was normal in 11 of the early cases, in the remainder it was raised, the systolic pressure being over 140 mm Hg in 27, and in 6 of these over 170 mm

This clinical picture is distinctive, and it must be emphasised that the onset was never preceded by an attack of acute nephritis It is true that acute (type 1) nephritis occasionally runs a rapidly progressive course with persistent œdema which may be gross (the subacute nephritis of Volhard) but there is no mistaking the clinical difference in these cases, if they die the histological picture is also characteristic and in our experience quite different from that of type 2 nephritis

LABORATORY INVESTIGATIONS

Urine—Oliguria is common, and unless an active diuresis with loss of œdema fluid is occurring the daily volume is usually small The specific gravity of the urine tends to be high, owing to the oliguria and the large content of albumin which is a characteristic feature of this type of nephritis The daily excretion of albumin may be 25–30 g Visible hæmaturia is rare and the guaiac reaction was positive in the urine in only a third of our cases at the onset The urinary deposit usually shows red cells, leucocytes, hyaline and granular casts

Renal function is commonly normal when these patients are first seen but there may be oliguria with extrarenal nitrogen retention Occasional cases show renal impairment within one to two months of the onset, these are severe cases which run a rapidly progressive course

Blood—The plasma proteins are always reduced and are usually less than 5% Blood-cholesterol is much increased The blood-count is often normal in the early stages, but a slight anæmia—Hb 80–90%, with 4–4½ million red cells—was present in about half the cases

COMPLICATIONS

Infections are common and often cause death They may arise at any stage of the disease but are particularly common in the early stages Pleurisy and peritonitis were noted in 8 of our patients and bronchopneumonia in 4, empyema, septicæmia and miliary tuberculosis also occurred Acute heart-failure and hypertensive encephalopathy do not occur in the early stage of type 2 nephritis An interesting observation is a massive diuresis with disappearance of œdema and great diminution of albuminuria following an acute infection, we have seen 4 instances of this following empyema, pneumonia, chicken-pox and cellulitis of the leg

SUBSEQUENT COURSE

The course of type 2 nephritis contrasts with that of type 1 nephritis, where four distinct courses were recognised, distinct not only clinically but in their pathological processes In type 2 nephritis there is in effect only one course that of steadily progressive renal destruction, with a remarkably uniform pathological picture We can recognise minor variations in the intensity and therefore in the duration of the disorder, but in all there is a steady progress to renal failure unless the course is cut short by some intercurrent infection

We have seen only 5 examples of recovery from this condition among the 145 cases we have studied In 3 of these no hypertension was recorded, in a fourth albuminuria and œdema disappeared but the patient died later from another cause and well-marked chronic changes were found in the glomeruli Owing to the insidious onset of the disorder and the varying duration of the disease at the time of admission this recovery-rate cannot be expressed statistically, since there is no large group of cases seen early in the disease from which such an estimate could be made It is clear however that recovery is exceptional, in striking contrast to type 1 nephritis where the recovery-rate in cases seen within fourteen days of the onset was 82%

The usual course, then, of type 2 nephritis is continuous and progressive, and some degree of œdema usually remains for months or years The patient may die from intercurrent infection at any time, but if this does not happen the blood-pressure, which may or may not have been previously elevated, eventually shows a sharp rise, fixation of specific gravity of the urine and other indications of renal failure become manifest and the patient dies in uræmia, usually with associated anæmia and hypertensive retinitis As the blood-pressure rises the œdema often disappears The rate of this downward progress varies from a few months to many years Out of 60 fatal cases 38 died from uræmia and 22 from intercurrent infection or other causes Of the 38 cases dying from uræmia the duration was less than a year in 5 and between one and five years in 21 In 11 the duration was between five and ten years and it was over ten years in 1 only On the other hand we have 6 patients under observation in whom the disease has been present for more than ten years, and in 4 of these the duration is over twenty years

The best indication of the probable rate of progress in the individual case is furnished by the blood-pressure In the early stages this may be high moderately high, slightly raised or normal In the cases in which the pressure is high in the early stages the course is relatively rapidly progressive to death in renal failure within one to five years of the onset, œdema is persistent or recurrent, but usually disappears (apart from terminal heart-failure) in the late stages as renal insufficiency develops, renal function is often impaired from the start and gradually deteriorates Sooner or later there is a well-marked terminal rise of blood-pressure—for example 250/140 mm Hg with hypertensive retinitis consisting of papillœdema, hæmorrhages and exudates Death in uræmia follows in a few months The cases in which the blood-pressure is moderately high may follow a similar but relatively slower course Alternatively the blood-pressure may return to normal and these cases tend to run a chronic course such as is commonly seen in the next group Cases with slightly raised or normal blood-pressure continue to pass large quantities of albumin in the urine for many years, œdema may persist throughout or the legs may swell at intervals, eventually the blood-pressure rises, renal impairment develops and the patient dies with hypertension and uræmia In some cases with normal blood-pressure in the early stages, œdema tends to be extreme and the patient often dies from intercurrent infection This is the type of case that would be called nephrosis by many observers If death or recovery does not occur in the early stages these cases too run a progressive course and in our experience eventually die with hypertension and uræmia

SUMMARY

Type 2 nephritis is a disease of insidious onset characterised by generalised œdema and gross albuminuria There is no definite relation to a preceding infection, and hæmaturia is slight or absent Recovery is rare, the course of the disease being steadily progressive Œdema is persistent or recurrent, and secondary infections common, being the cause of death in a considerable proportion of cases In the remainder there is progressive renal failure with hypertension which commonly leads to hypertensive retinitis as a terminal event The duration varies from months to years and bears a definite relation to the degree of hypertension present in the early stages

Histological Findings ‡

TYPE 1 NEPHRITIS

When the patient dies in the first few days after the onset the main lesion is an increased cellularity of the glomeruli with some polymorphonuclear infiltration, and both polymorphonuclear leucocytes and red cells appear in Bowman's space and in the tubules In more severe cases, particularly those dying with suppression after one or two weeks, acute fibrinoid necrosis of the arterioles and of the glomerular tufts is characteristic (fig 1) and early epithelial crescent formation may be seen

When death occurs after the rapidly progressive course, the outstanding feature is the formation of large epithelial crescents with associated hæmorrhage into Bowman's space, acute fibrinoid necrosis of arterioles is common (fig 2) and a few cases show an intense inflammatory infiltration of the interstitial tissue with "explosive" lesions of the glomeruli and definite peri glomerular inflammatory reaction, hyaline droplet degeneration of the tubular epithelium is present in this group After a duration of a year or more, interstitial fibrosis and moderate dilatation of the remaining tubules are found and the epithelial crescents have become organised with obliteration of the capsular space

When the disease follows the slowly progressive course the histological picture is distinctive (fig 4) The normal renal architecture is destroyed, interstitial fibrosis is severe and has a typically focal distribution with islands of dilated tubules in the intervening areas The glomeruli are greatly reduced in number—an important distinction from malignant hypertension—and although a minority may appear normal the majority are diseased In particular they show little or no vestige of the original nephritis but a combination of acute and chronic lesions which appear to be hypertensive in origin The acute lesions resemble those described in malignant hypertension and are usually accompanied by acute fibrinoid lesions of the afferent arterioles The chronic lesions (fig 3) include enlargement, with increased cellularity of the glomerulus, loss of lobulation of the tuft, and extensive capsular adhesions, pericapsular fibrosis may be seen and the afferent arterioles are often thickened and tortuous with hyaline degeneration of their walls, perivascular fibrosis, and narrowing of the lumen Larger arteries such as the interlobulars show endarteritis, often with a slight degree of elastic hyperplasia of the intima This is the picture which Russell (1929) aptly termed "nephritis acris repens" As I have pointed out the condition may progress insidiously for thirty to forty years and for this reason gross renal contraction is the rule in these cases

In brief, the histological picture in type 1 nephritis is, in its early stages, a diffuse lesion of the glomeruli with acute necrosis of the afferent arterioles as a prominent feature In the late stages the vascular (hypertensive) process with its characteristic focal distribution dominates the picture and there may be little or no evidence of the early lesions

TYPE 2 NEPHRITIS

The difficulty of observing cases of type 2 nephritis early, and of accurately timing the onset of the disorder, makes it impossible to describe the histological picture of the early stages with the same assurance as in type 1 Thus we have no cases dying within a month of the onset, 4 within two months and 6 within three months In 3 of these the blood-pressure was normal and hæmaturia and renal impairment were absent, so that these cases correspond to the picture of "nephrosis", and histologically they showed the changes described under this term—occasional bland focal necroses of the glomeruli with capsular adhesions (fig 5) and fatty degeneration of the tubular epithelium In the remaining 7 early cases, hypertension or hæmaturia or both were present, and the histological picture was again that described as nephrosis, except that in several instances there was a slight proliferative glomerulitis with a tendency to increased lobulation of the tufts (fig 6) With a rather longer duration this proliferative glomerulitis with accentuated lobulation becomes more definite, leading finally to a characteristic picture (fig 7) in the large group dying with hypertension and uræmia within five years of the onset The glomeruli are enlarged and show a uniform lesion the most striking feature of which is focal deposition of hyaline material at the centre of the lobules of the glomerular tuft The appearance may resemble amyloid degeneration but it does not give the stain for amyloid [illegible]al case this hyaline [illegible] the intercapillary stroma and can often be seen branching out from the hilum In other cases the hyaline change affects the capillary basement membranes and then appears more diffuse throughout the glomerulus Sometimes both intercapillary and basement-membrane hyalinisation are present in the same case Occasionally hyaline thickening of the basement membrane may appear without the usual proliferative glomerulitis and accentuated lobulation of the tufts In still more chronic cases there is a more advanced degree of the glomerular hyalinisation The renal lesion (fig 8) remains diffuse, the glomeruli slowly become completely hyalinised at a remarkably uniform rate, so that even when death occurs after some ten years the kidney shows no gross contraction and there is not the great reduction in number of glomeruli which is characteristic of type 1 nephritis in the late stages Vascular and glomerular lesions of the hypertensive type are rarely seen and interstitial fibrosis is diffuse rather than focal

---

‡ A full account of the histological findings in our series will be published later Only the main features are given here, with special reference to the course of the disorders

These changes are in striking contrast to those of type 1 nephritis In the early stages the glomerular lesions are quite different and necrotic vascular lesions are absent Of special significance is the difference in the chronic stage, for whereas in type 1 nephritis the early lesions give place to secondary hypertensive changes resulting in focal renal destruction, in chronic type 2 nephritis there is a progressive glomerular hyalinisation with diffuse renal destruction in which the hypertensive process appears to play relatively little part I think it is justifiable to conclude that these microscopic findings support the clinical distinction I have made between type 1 and type 2 nephritis and provide a histological counterpart of the different natural history in the two disorders

---

ZINC PEROXIDE PREPARATIONS

WITH NOTES ON CLINICAL USES

CLIFFORD HOYLE, M D LOND F R C P
ASSISTANT PHYSICIAN TO KING'S COLLEGE HOSPITAL AND BROMPTON HOSPITAL PHYSICIAN TO HORTON EMERGENCY HOSPITAL, E.M S

J W SPENCE, A I C PH.C
PHARMACIST TO THE BROMPTON HOSPITAL

S H. FAULKNER, M P S
ASSISTANT PHARMACIST TO THE HOSPITAL

ZINC peroxide has earned a reputation in the last few years for controlling certain infections, even when other means have failed We are indebted to Meleney and his colleagues[1-10] for displaying its capabilities which are now established in the care of chronic burrowing ulcers, bacterial and gas gangrene, and foul infections of the mouth and neck Tudor Edwards has used it successfully for wounds and also for abscess of the lung, and a few others have added to the list of applications It appears to owe its value to the liberation of atomic oxygen during contact with tissues and bacterial cells But the action is distinctive—it is more prolonged than for many similar compounds, and much more prolonged than for hydrogen peroxide Moreover zinc peroxide has more oxygen to offer than hydrogen peroxide, as used, reckoning in terms of available oxygen Like hydrogen peroxide, however, the zinc compound seems as innocuous to healthy tissues as to granulations for it does not impair the vitality of either. The twin advantages, safety and durability of action, should command a wider field of use for zinc peroxide, especially in war-time surgery, for they are among the hallmarks of desirable antiseptics

Early writers refer to zinc peroxide as applied in the forms of powder, lotion ointment or pencil, without giving detail of any pharmaceutical value Meleney uses a sterile suspension ready made to the consistency of 40% cream with an equal quantity of water ; and he refers also to single trials of a suspension in 1% gelatin and in 5% pyrophosphate solution[1] Application is by instillation or on gauze protected from evaporation by overlying paraffined gauze Such preparations are easy to handle in open lesions which are free of access, but they do not keep, so have to be freshly made, an obvious drawback in a busy ward Also the peroxide itself, and the oxide and hydroxide which it forms, congeal quickly as large flakes or concretions difficult to remove without pain from the depths of a wound a point noted already by Meleney and others Moreover the formation of this dep[illegible]s the continuous action of the peroxide, and thus may well cancel its most important asset Tudor Edwards (personal communication) uses a 10% ointment in unbleached soft paraffin, at body temperature this liquefies sufficiently to fill the crannies of an abscess and since it does not cake it is an excellent preparation, but even so the viscosity is high enough to make removal difficult before re-dressing unless approach is easy and it is troublesome to insert into a narrow track

Such disadvantages preclude these preparations from use in remote places or those with cramped access The object of this paper is to describe a number of alternative ways of using zinc peroxide which were devised in the first place for treating infected war wounds, residual empyema cavities and secondarily infected wounds after thoracoplasty. Suitable preparations need to be uniform and stable both chemically and pharmaceutically, retaining these properties over common ranges of temperature and for a reasonable time They ought to compare favourably with earlier preparations in liberating active oxygen when in contact with tissues Their viscosity should allow of easy flow through needles and small tubes, and any vehicle must be innocuous, readily obtainable easily sterilised and preferably cheap. and so must any suspending agent

GENERAL PROPERTIES

Zinc peroxide has long been a familiar commercial product Market varieties, under trade names, contain diverse proportions of actual peroxide with a maximum of 55%, mixed with the ordinary oxide, hydroxide and carbonate This form is a white, somewhat gritty powder, soluble in water only to the extent of 1 in 45 000 The simple formula for the peroxide ZnO_2 is probably, correct, although critics have put forward alternative and more complex structures One difficulty in accepting a simple formula is to account for variations in certain physical constants—thermal stability, for instance is reported to range from 50° C to 170° C No doubt this depends on the state of aggregation, but any variability does not matter pharmaceutically because sterilisation by heat is impracticable unless done with an elaborate laboratory technique

For medicinal purposes zinc peroxide should conform to the BP standards for zinc oxide in regard to metallic zinc and foreign elements ; the arsenic limit of 10 parts per million is the most important, and is safe enough Actually, tested samples have shown much less In this work a compound was used containing 38–40% of actual zinc peroxide, a standard product easily obtainable in this country Under ordinary conditions we found that deterioration of this compound is not more than 1% over three months in terms of absolute peroxide Control assay is thus desirable only after long storage Although zinc peroxide is a powerful oxidising agent it remains chemically active and stable in contact with ordinary hydrocarbons of the paraffin type Stability with vegetable oils needed investigation, and also stability when ionic conditions are present These three categories covered the vehicles most favourable for pharmaceutical use, and they formed a convenient starting-point for the present investigations

OINTMENTS

Ointments of zinc peroxide can be made over a wide range of strengths in absolute peroxide. but 2–10% are convenient and suitable for external application Made with either the yellow or white soft paraffins of the BP as the base they remain stable and active for lengthy periods There is no deterioration within six days as shown by initial assays, and hardly any loss up to several weeks, the period covered by present tests No difference in stability was found between the two varieties of soft paraffin Later investigations showed that the peroxide is quite indifferent to hydrocarbons in general

Zinc peroxide *	10
White soft paraffin to	100

Sterilise the white soft paraffin by heating for an hour at 150° C in a hot air oven Cool to normal temperature Remelt the white soft paraffin at a temperature not exceeding 50° C Incorporate the zinc peroxide by sifting it through sterile muslin into the melted paraffin under aseptic conditions. Store in sterile containers

---

* In all cases the proportions of zinc peroxide are in terms of absolute ZnO_2

SUSPENSIONS

Water or saline solutions are unsuitable vehicles for zinc-peroxide suspensions, excepting for emergency use, because sedimentation is almost immediate and decomposition rapid Stable suspensions can be made, however, either with a vegetable oil or with liquid paraffin , but in each case a suspending agent is needed to avoid flocculation which otherwise occurs within a few hours The traditional agents of pharmacy were tried, but they proved unsuited for a variety of reasons Trihydroxytriethylamine, now widely used in the cosmetic industry, was also tried, but it was unsatisfactory in concentrations below 1%, and higher figures were not regarded as safe for use on raw surfaces [11] Eventually we found that glyceryl monostearate, one of the newer emulsifiers, gave satisfactory results For the particular purpose of acting as a suspending agent in a vegetable oil this substance has the advantage of close chemical relationship with the ordinary fatty glycerides, and moreover it is harmless

A range of vegetable oils was then tried, both individually and in combination, for making a series of experimental suspensions Nut oil (oleum arachis, BP) proved to be the most satisfactory vehicle Fortunately it is readily obtainable

Zinc peroxide	10
Glyceryl monostearate	3
Nut oil to	100 (all by weight)

Sterilise the nut oil by heating for an hour at 150° C in a hot air oven Cool to normal temperature Add the glyceryl monostearate to the nut oil Heat both to 130° C for an hour Cool to normal temperature Incorporate the zinc peroxide with the nut oil and monostearate in a sterile mortar under aseptic conditions, sifting the zinc peroxide through sterile muslin Store in sterile glass stoppered bottles, capping with sterile parchment paper

Standardised preparations made to this formula were then assayed at intervals to gauge stability It was found that no loss of available oxygen could be detected within a month under ordinary storage conditions After that a small loss was progressively detected, but not more than 10%, in terms of absolute zinc peroxide, over three to four months A typical example was provided by results from three samples used in clinical trials These were made on Feb 13, 1941, and the residues examined on June 4, 1941, yielded respectively 9 1%, 8 2%, and 9 8% of absolute ZnO_2, a mean loss of 10% of the original content after four months At lower temperatures this oily suspension solidifies A quantity kept for sixteen days at 22° F readily reliquefied at body temperature The peroxide had remained constant At higher temperatures there is a tendency for the peroxide to separate from the oil, but immediate recombination takes place on shaking A quantity kept at a temperature ranging between 110° F and 120° F for sixteen days separated during this period, but recombined at once on slight shaking with no alteration in the physical condition of the suspension Stored in capped stoppered bottles the loss in peroxide content under such conditions was found to be less than 5% in terms of ZnO_2, an insignificant amount from the practical point of view These results with extremes of temperature showed that the suspension retained its character in a way that should allow its use in either cold or hot climates

This suspension was subsequently put to a preliminary series of clinical trials extending over more than a year Meleney and Johnson [3] mentioned that the bactericidal action of zinc peroxide is lessened in an oily suspension, but they gave no details and have made no further reference Bacteriological studies have not been practicable during the present tests, but clinical observations have left no doubt that the action is considerable, allowing for the absence of such controls The preparation is easy to handle, and seems about as effective therapeutically as a watery suspension or paraffin ointment and it has advantages over both It remains physically stable in contact with tissues, whether infected or not, and it satisfies other pharmaceutical criteria mentioned above Evidence of any local or systemic toxicity has not been found so far The margins of treated wounds become healthy Infected areas soon show less tissue destruction and the appearance of healthy granulations Necrotic debris loosens and is then more readily removed, and any foul odour quickly goes On several occasions light packing with impregnated gauze has controlled the sepsis in a wound and thus stopped secondary hæmorrhage When dealing with narrow sinus tracks, more particularly those from chronic empyemas in this instance, the preparation can be instilled and retained in situ as long as desired with the aid of proper posturing, or the track may be lightly packed with saturated gauze With either technique the peroxide is easily recovered because the preparation does not adhere to the walls of the cavity, so that there is no appreciable residue to act as a foreign body or source of metallic poisoning Recently the preparation has been poured into chronic empyemas of the localised kind with bronchial fistulæ; although on occasion the oily taste of the preparation has been noticed by such patients no evidence of bronchial irritation has appeared and no harm has resulted

Although 10% of absolute zinc peroxide was selected for trial, stronger suspensions can be made over a wide range of strengths up to 25% But their greater viscosity restricts their usage, and 10% is the most satisfactory Others, with liquid paraffin as the vehicle, have been tried also , but so far they have not been more effective in treatment, and they need traces of free fatty acids incorporating, as well as glyceryl monostearate, for stabilising the suspension , 3% of anhydrous wool fat is suitable

Zinc peroxide	10
Wool fat	3
Glyceryl monostearate	3
Liquid paraffin to	100 (all by weight)

Mix the wool fat, the glyceryl monostearate and the liquid paraffin Heat to 150° C for an hour in a hot air oven Cool to normal temperature Incorporate the zinc peroxide with the mixture in a sterile mortar under aseptic conditions sifting the zinc peroxide through sterile muslin Store in sterile glass stoppered bottles, capping with sterile parchment paper

There is nothing to choose between nut oil and liquid paraffin suspensions as regards stability and deterioration, nor in the facility with which they can be used

A feature of these suspensions is that other active ingredients may be incorporated if chemically compatible For instance, scarlet red was introduced into the oil suspension in strengths up to 5% This was used when surface epithelialisation lagged behind the previous rate of successful granulation of an infected site, prolonging the time in hospital From a small experience so far this manœuvre has been worth while, and deserves further trial

GELATINS

In his first paper Meleney [1] mentioned a single trial of a suspension in 1% gelatin, but he has not returned to the subject since The possibilities of gelatin as a vehicle were considered early in these investigations, though it was not thought a promising field as the presence of water favours decomposition of zinc peroxide In this, however, we were mistaken

Liquid preparations—Gelatin solutions of various strengths give stable suspensions pharmaceutically The best is a 15% solution, and no additional suspending agent is required At room temperature this preparation is solid, an advantage for transit but liquefied at body heat it is of almost watery consistency, and is then easier to use than either oil or paraffin suspensions where introduction into the depths of a wound through a needle or small tube is inevitable The disadvantage is that it flocculates much more readily than the others, and for this reason is less suitable for general purposes Work on its chemical stability was therefore discontinued

Zinc peroxide	10
Gelatin	15
Distilled water to	100

Dissolve the gelatin in the requisite quantity of distilled water Filter Sterilise the solution by the following process Heat in steam at 100° C for an hour on the first day Autoclave at 110° C for an hour on the second day Heat in steam at 100° C for an hour on the third day Cool to normal temperature Adjust the reaction of the solution to pH 8, using sterile N/1 sodium hydroxide Warm gently Incorporate the zinc peroxide with the gelatin solution in a sterile mortar under aseptic conditions, sifting the zinc peroxide through sterile muslin Store in sterile glass-stoppered bottles, capping with sterile parchment paper. Keep in refrigerator

Solid preparations—A series of solid gelatin preparations was made imitations of Unna's paste. It was found possible to obtain chemically and pharmaceutically stable gelatins of this kind over a wide range of strengths of zinc peroxide A preparation made to the formula of the official gelatinum zinci but containing the peroxide instead of the simple oxide gave on assay 6 5% of absolute ZnO. This remains chemically stable for at least a month in ordinary conditions of storage and temperature It is of course like Unna's paste, unsterilised and the present trials did not provide suitable conditions for its use

Zinc peroxide	6	Glycerin	35
Gelatin	15	Distilled water to	100

The process for gelatin of zinc BP is followed, the peroxide substituting the lower oxide (The ingredients are not sterilised)

SUMMARY

The pharmacy of zinc peroxide has been investigated and a number of ointments liquid suspensions and gelatin preparations devised which are active and stable

Ordinary paraffins are the most satisfactory vehicles for ointments, and nut oil (oleum arachis BP) for liquid suspensions.

Glyceryl monostearate is a good suspending agent for oil suspensions and a suitable formula is 10% of absolute zinc peroxide with 3% of monostearate Preliminary clinical trials indicate that in this form the peroxide is at least as active as in simple watery suspension; and the stability consistency and flexibility in use are practical advantages which make it preferable

We are indebted to surgical colleagues of one of us (C H) at Horton Emergency Hospital for their help, and for facilities for clinical trials, to Sister Gaffikin and her staff for their careful observations, and to the resident medical staff attached to the Chest Unit at the hospital for their coöperation We wish to acknowledge the supplies of standardised material provided by the Laporte Chemical Co , Luton The glyceryl monostearate was obtained from A Boake Roberts and Co of Stratford.

REFERENCES

1 Meleney F L (1935) *Ann Surg* 101, 997.
2 — (1936) *Surg Clin N Amer* 16, 691
3 — and Johnson, B A. (1937a) *Surg Gynec Obstet* 64, 387
4 — — (1937b) *Surgery*, 1, 169
5 — (1937) *Internat J. Orthodon* 23, 932
6 — (1938) *Ann Surg* 107, 32
7 — (1939) *Surgery* 6 845
8 — and Harvey, H D (1939) *Ann Surg* 110, 1067.
9 — (1939) *N Y State J Med* 39, 2188
10 Johnson and Meleney (1939) *Ann Surg* 109, 881
11. Kindsvatter V H (1940) *J indust. Hyg* 22, 206

RECOVERY FROM AGRANULOCYTOSIS AFTER A RIGOR DURING TRANSFUSION

R M. Cross, L.R C.P E.
FLIGHT LIEUTENANT, R.A.F V R.

It is known that if an attack of agranulocytosis is interrupted by a sudden pyrexia large numbers of granular leucocytes may appear in the blood-stream equally suddenly Israëls and Wilkinson[1] recorded such an incident in the course of agranulocytosis due to amidopyrin The case to be described here represents an extreme example of this phenomenon in a patient whose agranulocytosis was due to sulphapyridine and who had not responded to pentnucleotide

An airman, aged 20, was inoculated on Aug 18, 1941, with TAB and ATT. On the day after inoculation he developed pyrexia with a severe local reaction, and during the next ten days he was given 42 g of sulphapyridine by mouth. By this time he complained of tenderness of the lower gums and stiffness of the muscles of the neck, and the tonsillar glands were found to be enlarged The total white-cell count was 2500 per c.mm with complete absence of granular leucocytes. He was treated with intramuscular injections of pentnucleotide, 10 c cm twice a day, for seven days Blood-transfusions were also given his blood group was AB and he was given blood from group O donors, direct compatibility tests being carried out each time After one pint of blood on Sept 1st his total leucocyte count increased to 3500 per c cm , with neutrophils 3% By this time he had ulceration of the lower gums and cheek, the tonsillar glands were enlarged and painful, and he had an intermittent pyrexia, rising to about 100 2° F After pentnucleotide for a further two days, the total white cell count had increased to 5000, with neutrophils 6% A second pint of blood was given on Sept 4th and the total white-cell count increased to 8000, with neutrophils 13% Tenderness of the glands decreased and he felt much better On Sept 8 a third pint of blood was given, but this had to be discontinued after half a pint had been run in because he had a severe rigor, lasting for about fifteen minutes Blood films taken immediately after the rigor showed a slight increase in the total white cell count and in the percentage of neutrophils Four hours after the rigor his temperature rose to 105 6° F The total white-cell count was then 40,000 per c cm with neutrophils 85%, almost all the neutrophils were immature Next morning his temperature came back to normal and in two days the ulceration of the gums healed completely During the next four days his total white-cell count and the percentage of neutrophils gradually returned to normal The neutrophils also progressively appeared more mature He was discharged from hospital on Oct 8, fully recovered

There was no question of an incompatible blood-transfusion so the cause of the pyrexia is a mystery Nevertheless it effectively cut short the agranulocytosis, and this suggests that an artificial but controlled pyrexia, such as that produced by protein shock, if used with caution might be useful in aborting such attacks

SUMMARY

A case of sulphapyridine agranulocytosis responded poorly to pentnucleotide

A rigor and pyrexia produced by blood-transfusion provoked an intense granulocytosis The patient's symptoms remitted and there was no recurrence

---

ANTHRAX SEPTICÆMIA

A FATAL CASE

A. G M Severn, M.A CAMB M D BRUX , D P.H
MEDICAL OFFICER OF HEALTH FOR PONTYPRIDD

A girl, aged 17 years died at her home in less than thirty-six hours from an acute illness with high temperature and severe headache Cerebrospinal fever being prevalent at the time in the immediate locality, and in the absence of a satisfactory diagnosis, the local health department, with the somewhat tardy sanction of the Welsh Board of Health, made arrangements for an autopsy, which was carried out by Dr. J Gough pathologist to Cardiff Royal Infirmary The results of this examination are summarised below

The air passages showed slight congestion Each pleural cavity contained blood-stained fluid, ½ pint on the left side and ¾ pint on the right The lungs were very congested and œdematous The spleen was moderately enlarged, pulp very soft Both kidneys were congested, small hæmorrhages in the pelvis of the right The pia-arachnoid was extremely congested over the hemispheres, with subarachnoid hæmorrhage on the upper and lateral aspects and along the Sylvian fissures There was little congestion and no hæmorrhage at the base of the brain. There was hæmorrhage into the subarachnoid space in the upper thoracic region of the spinal cord The brain was very congested with small hæmorrhagic areas in the cerebral grey matter, thalami and other basal ganglia, and near the vermis of the cerebellum

Microscopic examination—The brain showed an acute hæmorrhagic inflammation of the pia arachnoid over the hemispheres The subjacent brain showed an acute inflammation of perivascular distribution in the grey matter. Similar inflammation was present in the basal ganglia and cerebellum. In the lungs there were hæmorrhagic areas in which the lung tissues were destroyed The spleen was intensely congested, the pulp was infiltrated with inflammatory cells

Bacteriological examination—From the meninges, brain, spleen and blood a spore bearing aerobe was grown in pure culture The same organism, together with *Streptococcus viridans*, was grown from the lung From the intestine only *Bacterium coli* was grown The spore-bearing organism was pathogenic for the guineapig and mouse and identified as *Bacillus anthracis*

---

[1] Israëls, M C G and Wilkinson J F *Quart J Med* 1937, 6, 35

Cause of death —Septicæmia and meningo encephalitis due to anthrax infection

The patient had, of course, received no specific treatment for anthrax, as such was not even suspected prior to death, nor had any form of chemotherapy been instituted

Up to ten days prior to her illness the girl had been working *in a modern South Wales brush factory* Two days before ceasing her employment there she had what her parents describe as a boil on the middle phalanx of the second finger of the right hand, from the centre of which her father, who possessed some knowledge of first-aid, extracted a bristle which had entered the finger in the course of her work The lesion subsequently healed without medical aid being called for Her final illness began twelve days after this incident, the patient being quite well in the interval

It was ascertained that the girl had been employed in sorting horsehair and pig bristle imported mainly from China and South America, clean overalls being regularly worn by employees in this section of the factory Samples of material used by her were bacteriologically examined by Dr V D Allison Ministry of Health, who reported that of the seven different batches of suspected horsehair and bristle submitted three were heavily *contaminated* with aerobic spore-bearing organisms, and from one of these—a mixed horsehair—he succeeded in isolating a colony of typical *B anthracis* which proved lethal to a guineapig

DISCUSSION

According to Muir and Ritchie's "Manual of Bacteriology" (6th ed p 354) "cases have been recorded in which hæmorrhagic meningitis, associated with the presence of anthrax bacilli in large numbers has occurred as a complication of various primary lesions" It is interesting to note that in the present case microscopical examination of sections from the brain showed evidence of an acute encephalitis

It is difficult to be certain whether this was primarily a case of malignant pustule or of wool-sorter's disease The clinical history suggests that the portal of entry of the infection was the finger, giving rise to a malignant pustule which healed spontaneously, as there was no evidence of this lesion at autopsy It is known that the malignant-pustule form of anthrax may heal spontaneously without treatment and without producing generalised symptoms, but it is a moot point whether the local infection can heal and at the same time the anthrax bacillus gain access to the circulation and produce a generalised infection It will be noted that almost a fortnight elapsed between the injury to the patient's finger and her final illness, and this may have been due either to a small infecting dose or to the organism being of relatively low virulence

The post-mortem findings showed evidence of a hæmorrhagic pneumonic condition compatible with a diagnosis of wool-sorter's disease, but this may have been only part of the generalised infection The fact that the girl had been away from the brush factory on holiday for ten days prior to her final illness is also a point against the diagnosis of primary pulmonary infection with anthrax, for the incubation period in this condition is very short, and is usually accepted as 1–3 days

Dr W R Nash, M O H for Caerphilly, kindly supplied the clinical history of this case

---

THE school medical service of GLASGOW suffered considerable dislocation as the result of the war, so Dr J Miller Young's report for 1940 gives but an incomplete picture There were 44 new cases of corneal ulcer as against 51 in 1939, but there was no case of strumous ophthalmia against 56 in 1939 New cases of interstitial keratitis sank from 19 to 7 Scabies increased from 1995 to 2412 cases, but impetigo decreased from 5576 to 2210 An interesting return is 202 cases in 1939 and 72 in 1940 of herpes zoster Suppurative otitis media, which gave 739 cases in 1939, produced only 348 cases in 1940 Head ringworm declined from 69 to 48 and body ringworm from 260 to 91 cases There was a decline of 55 8% in all cases treated, but this cannot be read as a real decline in cases needing treatment, for the upset of the department interfered with inspection and detection and to a lesser extent with provision of treatment

Medical Societies

ROYAL SOCIETY OF MEDICINE

AT a meeting of the Section of Neurology on Dec 18, with Colonel George Riddoch, the president in the chair, a discussion on

Rehabilitation after Injuries to the Central Nervous System

was opened with a paper contributed by Prof Geoffrey Jefferson, read in his absence by the president In peace-time (he wrote) the care of patients recovering from head injuries had left much to be desired Important difficulties had been lack of control over the conduct and welfare of the patient once he left the hospital, and deficiency in bed accommodation in first-class hospitals The patient therefore rehabilitated himself as best he could under his doctor's supervision In the industrial population this was a slow process On an average, a case of head injury was not referred for specialist advice for six months, and the period was often far longer By that time a neurosis had become firmly established The point was that these patients were nearly all nice folk who had no business to get into the states they were in The worst offenders were the insurance companies, who allowed cases to drag on inconclusively before asking for skilled advice War-time conditions made waste of man-hours a serious matter Neurologists were now trying to rehabilitate these patients in weeks instead of months Much of the teaching had to be revised, old beliefs were being critically examined and found to be insecure, without complete certainty of the nature of their successors Nevertheless, Professor Jefferson believed that neurologists were on the right lines Rehabilitation might be defined as the planned attempt, under skilled direction, by the use *of all available measures, to restore* or improve the health, usefulness and happiness of those who had suffered an injury or were recovering from a disease Its further object was to return them to the service of the community in the shortest time Basically, all medical treatment had no other aim Rehabilitation was a continuum closely interwoven throughout with the general medical care of the patient All could and must help in the work, it did not fall within the ambit of any one man or specialty It was planned to give the patient a sense of his own importance as an integral part of the social structure, to assure him a sense of achievement, and to give him the opportunity to discover that, in spite of his injury, he still had useful powers and his wage-earning capacity was not lost As a national and planned effort, rehabilitation did not yet exist, and the fluid state of the hospital system made the present a favourable time for an experimental beginning on a reasonably wide scale Such treatment should be begun as soon as the patient's condition allowed It should include diversional and constructive occupations, hospital maintenance work, physiotherapy, and intellectual and recreational pursuits In the first stage, which might begin when the patient was still in bed, rehabilitation might consist of reading or being read to, the solution of puzzles, drawing or colouring, needlework, knitting, or making rugs or baskets In most cases of dysphasia, re-training of speech by a speech therapist was required Ambulant patients might work at book-binding, string, leather or metal work, or simple carpentry Concerts, *films and dancing were already available in some centres* Patients who could not tolerate the noise should have access to an adequate silence room A most important service of rehabilitation was the institution of a timetable by which nearly every part of the patient's day was dedicated to some pursuit Physiotherapy should not dominate rehabilitation—it occupied a very small part of the day and was largely passive, whereas other types of occupation excited the patient's interest and cooperation During the earliest stage its chief function would be massage and encouragement to move paretic limbs The proper use of the psychologist was that he should report on cases of head injury in much the same way as reports were made by the radiologist or pathologist It was important to assess the patient's character, emotional qualities, recognition of values, reactions to problems and aims in life In more serious injuries, where some degree of traumatic dementia had occurred, the neurologist would naturally lean on the psychologist more heavily The effects of the operation had usually passed away in about 8 weeks, and the second stage or period of hardening then began Military cases should then be taken over by the Service authorities to be rehabilitated in Service pursuits under discipline Rehabilitation would henceforward include gymnastics and physical training work in the garden and carpenter's and engineer's shops organised games, and walks outside the grounds Visits to shops and cinema should have the purpose of finding out how the patient reacted to crowds and traffic, and how well he could sustain visual and auditory attention. When the patient left hospital much could be done by informing him and his doctor what sort of an injury he had and what was expected of him. Speech with the wife or relatives would help to make them aware of the most important facts about head injuries and to divert them from over-solicitude In the whole of rehabilitation instruction of this sort took first place

Prof HUGH CAIRNS emphasised that the varying time factor in recovery must be taken into account in planning rehabilitation. The best yard-stick for determining the severity of a brain injury was the duration of the post-traumatic amnesia Roughly speaking, if this lasted 5 min to an hour the shortest time in which recovery could be expected was 4–6 weeks if it lasted 1–24 hours recovery would take 6–8 weeks if it lasted 1–7 days recovery would take 2–4 months, and if it lasted more than a week recovery could not be expected in under 4 months The central disturbance was one of thinking at various levels—at lower levels there might be an impairment of speech reading calculation orientation memory or concentration, at higher levels impairment of initiative, judgment or capacity for abstract reasoning To guide a patient satisfactorily through the stages of rehabilitation the doctor must assess his condition in terms of these functions The question of whether he would be fit for his previous work must be answered as early as possible and the answer would often largely depend on his retention of the capacity to learn The unstable man would find greater difficulty in his return to work than would the stable. Observation of the man himself and systematic inquiry into his personal and family history were all-important Almost every patient who made a full recovery from concussion suffered at a certain stage from headaches, and after a serious injury they might come on very late in convalescence It was however one thing to have a headache and another to complain about it The patient's reaction varied considerably with his emotional make-up his anxieties and fears his ability and desire to return to work An unstable man would probably need special treatment if he were not to break down on return to work.

Dr W. RUSSELL BRAIN declared that the high incidence of neurosis after injury and the continual neglect of it was a national reproach. A survey of 100 consecutive cases of head injury caused by road accidents and another 100 caused by industrial accidents showed clearly that neurosis was much commoner in the industrial cases, and in unskilled as compared with skilled workers An industrial injury was an occupational injury, and therefore suggested to the workman that his occupation was dangerous and his economic position insecure The legal procedure was widely different in the two groups—after a road accident the insurance system was in most cases a guarantee of compensation, but after an industrial accident the workman's claim was often contested, and the defects of the workmen's compensation law contributed to the development of neurosis Rehabilitation should begin with the general practitioner or casualty officer who first saw the patient, these needed to learn the right psychological handling of the injured man, to avoid suggesting grave disability and hospitalising light cases Special accommodation should exist for head-injury cases at every hospital, and some members of the staff should be trained in their treatment Light work should be adjusted to each man's capacity The responsibility of society for the injured should be more widely realised, and the law should be altered to remove the present disputes over sums of money and to introduce systematic rehabilitation.

Dr LUDWIG GUTTMANN urged that rehabilitation should start immediately after the injury and the patient continuously treated throughout under the supervision of the same doctors Förster's work had demonstrated the importance of systematic aftercare and a good understanding of the idea of rehabilitation Not all peripheral nerve injuries could be immediately brought into special centres therefore all general and military hospitals should arrange that the patient could be seen immediately by a specialist versed in the after-treatment of these lesions An integral part of a rehabilitation service was a thorough record of all early treatment Strengthening of synergistic muscles could be of great practical value. Electrotherapy would accelerate rehabilitation if carried out regularly, especially in cases of atrophy and would maintain or improve the elasticity of paralysed muscles Remedial exercise should aim at quick movements over the widest possible range

Dr ELIZABETH CASSON emphasised the importance of training in occupational therapy, and the provision of centres where daily treatment could be given and the orthopædic surgeon or neurologist could keep in touch with the occupational therapist A great difficulty was the neglect of psychological training in the study of physical medicine, whereas occupational therapy, having originated in America had a psychological basis Students in it were trained to regard the patient as a person getting well and to teach him so to regard himself They were taught to apply every possible principle of ordinary psychology continuously—to exploit the patient's curiosity, herd instinct and desire to follow a leader, so that the patients in a centre were welded into an enthusiastic group actively interested in the task of getting well Amateurs should not engage in this work Insurance companies should somehow be induced to realise that it would pay them heavily to maintain rehabilitation centres

Mr D W C NORTHFIELD admitted that Professor Cairns had somewhat startled him by proposing to begin active treatment so early. He had always supposed that nearly all headaches had an organic basis and called for complete rest in bed

Dr H J EHRENWALD advocated histamine ionisation for postconcussion headaches Patients with hysterical headaches did not respond to this treatment

Dr WILFRED HARRIS felt that insufficient stress had been laid on damage to the dura as a cause of headaches, and that recovery might have to be measured not in weeks or months but in years The nerve-supply to the dura was almost entirely through the trigeminal nerve and if an injection of procaine into the Gasserian ganglion immediately relieved the pain an injection of alcohol might permanently cure it.

Mr WYLIE MCKISSOCK complained that in the majority of centres organisation was seriously deficient Before proper rehabilitation was possible the necessary personnel must be enlisted Not enough doctors were capable of supervising it, and there was need of more almoners, social workers and clerical staff

The PRESIDENT remarked that the rehabilitation committee of the Ministry of Health had been working on this question, and the orthopædic centres had occupational therapy well organised Similar provision was to be made for the brain-injury centres. The real difficulty was that the supply of trained medical and auxiliary personnel was not nearly large enough

Major B B HICKEY commented on the great preponderance of persons of lower-grade intelligence among the patients with postconcussional syndromes

Major H. G GARLAND confirmed that personality might be a more important factor in prognosis than the severity of the injury—a good brain would recover from anything, but a bad brain might not recover from even a trivial injury.

The PRESIDENT reminded the meeting that while occupational therapy might need special personnel and apparatus, its elements might be carried out quite simply Rehabilitation was treatment as a whole the medical staff should re-orientate their minds in the meaning of treatment and encourage their patients to coöperate in the process of recovering function making them feel they were members of a team

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—At a meeting of this society at 17 Bloomsbury Square London, W C 1 on Thursday, Jan 8 at 2.30 P M Prof. A St George Huggett M.B will speak on the embryo as a patient

Reviews of Books

Dietetics for the Clinician

(4th ed) Editor MILTON ARLANDEN BRIDGES, M D, F A C P London Henry Kimpton Pp 960 45*s*

THE gap between theory and practice is probably wider in dietetics than in any other branch of medicine This is to be explained partly by the rapid advance of nutritional knowledge and partly by our deep-rooted unconscious prejudices about food Such books as this may help to narrow the gap Written by some twenty American contributors it begins with a competent review of our present knowledge of nutrition An account of the dietetic management of more than a hundred diseases follows, in which readers are advised to assess a new diet by checking it against " sound known physiologic demands " , if it fulfils these, if it is palatable and avoids monotony, and if under observation it gives a clinical response, then it is a good diet Not all the contributors however adhere to this article of faith For example readers are warned that dietaries commonly advocated may be lacking in essential factors, especially vitamin C , yet the diets recommended for gastric hyperacidity, typhoid and several other conditions are extremely deficient in this vitamin Diets too are suggested which have certainly not been shown to ensure clinical response What evidence is there that a particular diet has any effect whatever in hæmophilia, and how many clinicians would nowadays treat pernicious anæmia or simple goitre dietetically ? Other queries will occur to the critical reader Why do all the diets recommended for typhoid fever contain lactose as the only sugar ? What evidence is there that glucose is activated on absorption ? What exactly are the " carbohydrate deficiency diseases " ? Is cretinism really unknown where sea-food is consumed ? Most of the faults however could have been avoided by more adequate editing and the dietetic management of some diseases, especially those of the skin and of the gall-bladder, is described logically and usefully The 300 pages of tables, mainly on the composition of foods, are excellent for reference

Carcinoma of the Rectum

with special reference to its pathology and treatment
LIONEL E C NORBURY, M B Lond , F R C S London H K Lewis and Co Pp 68 7*s* 6*d*

THIS small book would make a good chapter in any volume on rectal diseases The pathology of adenocarcinoma of the rectum is set out understandably, and much well-balanced information is reinforced by good pictures Due credit is given to Dukes's excellent work A short historical survey of treatment is followed by outlines of the established types of operation in use today , Mr Norbury appears to favour synchronous combined excision, with the patient in the lithotomy Trendelenburg position Thirteen statistical tables based on the past ten years work at St Mark's Hospital make valuable study The length of the book was no doubt limited by the time allowed for the delivery of a Hunterian lecture, but as such it is excellent

Medicine and Mankind

ARNOLD SORSBY, M D Leeds, F R C S London Faber and Faber Pp 236 12*s* 6*d*

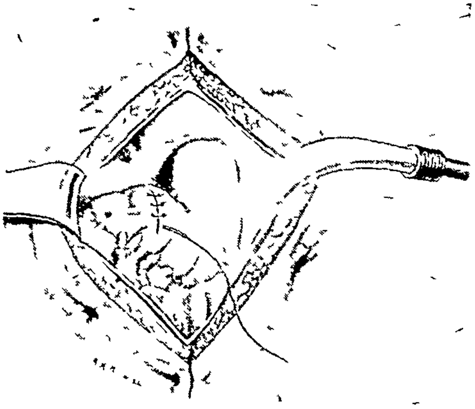
SCIENTISTS in recent years have begun to study the social relations of their subjects, but though there are eight times as many doctors as professional scientists in this country few books written by the medical profession have attempted to relate medicine to the social community in which it is practised Medicine has been for so long an individual relationship between doctor and patient that neither party to the contract was able to see the wood for the trees When medicine developed its recent scientific aspect as contrasted with its ancient art, the physician tended even more to lose sight of the patient as a member of a community Each patient became a test-tube for complicated chemical experiments, conducted in a hospital and unrelated to the world in which the patient had lived hitherto and to which, if fortunate, he would return It was perhaps the workers in the field of nutrition who reminded us most sharply that man is a social organism, and must be studied in relation to his environment, industrial medicine has also made some pointed comments But apart from the focusing of attention on particular social and economic factors, few people have found a philosophy of medicine that makes much sense in our world, whether in peace or war

Prof Sigerist in his recent book (" Medicine and Human Welfare ") indicated the thread that can be traced down the centuries, binding both patient and physician to each other and to their ever-changing environment Mr Arnold Sorsby's book develops the same theme, but weaves the thread into a broader fabric Health and disease are no longer static concepts , each is an unstable physicochemical equilibrium constantly responding to the shifting equilibria of the outer world The study of medicine, including everything that pertain to the physical welfare of man, must therefore take into account not only the internal structure of man, but also the outer world and his interaction with it This thesis is elaborated in detail , diseases are conveniently classified as appearing in bodies that are ill-formed, ill-balanced, abused or assaulted—terms corresponding roughly to the genetic, endocrine, nutritional and toxic aspects of disease Clearly written and well illustrated the book, though designed for a wider public, should appeal to medical readers

New Inventions

AN IMPROVED CURVLITE RETRACTOR

AFTER well over two years' use Curvlite instruments have been greatly improved in construction and light value The manufacturers have about doubled the strength of the light without using either a higher voltage bulb or stronger current This has necessitated redesigning the lamp holder, thus overcoming the overheating of the collar in which the lamp is contained A further important advance in design is that the instruments are now more readily interchangeable The screw thread has been dispensed with, and each instrument is fitted with a metal sleeve which plugs into the handle, being securely fixed by means of a screw which bears down on the metal sleeve (see figure)



Rent in sigmoid colon due to blast, being sutured with aid of curvlite retractor

In abdominal surgery today these instruments are invaluable All kinds and shapes of curvlite retractors can be easily and quickly fitted into the handle War surgery can be continued under varying and difficult circumstances if curvlite instruments are at hand, for the lighting is independent of the lighting in the operating-theatre which may fail during heavy air attacks This has actually happened more than once Their value in mobile operating-theatres and other small operating-rooms ashore and afloat has been considerable

The improved curvlite instruments are made by Vann Brothers Ltd , of Weymouth Street, W 1

CECIL P G WAKELEY, C B , D SC , F R C S ,
Surgeon Rear Admiral, R

THE LANCET

LONDON SATURDAY, JANUARY 3, 1942

STORY TELLING

On Sept 25, 1914, **Adami** of Montreal wrote a letter to **Osler** of Oxford expressing a desire for a medical history of the war that was then breaking out in Europe. **Osler** sent the letter on to **Keogh** who at once commissioned **Brereton** to prepare the material. This was the beginning of a task which ended only in 1931 with the publication of the twelfth and final volume of a history told on 6000 pages in some 2¼ million words. Never before had anything of this kind been attempted and it proved hard going. For a while **Brereton** carried on with one lady clerk but in November 1914, **Fletcher**, on behalf of the Medical Research Committee (Council) offered a statistical department with **Brownlee** in charge. **Keogh** then appointed an imposing consultative committee to study the framework of the history, following the way of its kind this committee met but once, leaving the initiative to its joint secretaries, **Fletcher** and **Brereton**. **Elliott** collected pathological specimens in France and devised a new system of field medical cards, under his instruction **Sewell** and **Maxwell** painted their glorious sketches of cases and morbid material. And still the history remained to be written. Only in December, 1918 when the war was over was **Macpherson** given the organisation of the writing, assisted by **Osler** **Herringham** **Elliott** (medicine) **Bowlby** **Wallace** **English** (surgery), **Horrocks**, **Beveridge** (hygiene) **Leishman** **Cummins** (pathology) **Brownlee** **Galwey** (statistics), with **Fletcher** and **Brereton** for general scientific and historical subjects. On **Osler's** death his place was taken by **Balfour**.

And then they set to work. Four volumes of general history to tell of 637 746 hospital beds 770 medical units 75 hospital ships, with a total personnel for medical services of 144,514, and 38 000 war diaries to give an air of verisimilitude to the "voluminous administrative medical files". The narrative would have rejoiced **Adami's** heart and the only burning was on the part of those territorial and new military hospitals for whose detailed historical accounts no room could be found. Whether it should serve as an example or as a warning to the future historian is another matter. For reference it is priceless but judged by literary standards it is more the material for a history than the history itself. Might it not even come under the lash of **Wells's** habitual piecemeal thinking and still fire some born journalist to tell it again for the plain man in an attractive binding? The next three double volumes were factual records of surgery, disease and hygiene, much of which is still the current stuff of medical thought. The surgeons have left on record only those methods which at the end of the war had been found to be the most trustworthy. It was just bad luck for them that the chemist had not then grafted sulphur and nitrogen on to the benzene ring at the right place. ysicians were handicapped by lack of opportunity for analysis and study of war diseases, for general military policy had severely restricted publication of accurate records. The hygienists told of an awakening of the sanitary conscience in all who served in the forces which will prove a lasting benefit to the whole human race, while the engines of war were becoming more complex every day they were getting results from petrol tins and horse sense which rivalled anything before known. The pathologists content with one volume, were the half-backs who knew best what was going on in the scrum they were witness of **Keogh's** plaint "We went straight back into all the septic infections of the Middle Ages." Enteric fever might, as **Leishman** said, have been the subject of the blackest chapter in medical history—but it wasn't. This volume is practically a series of monographs. The last volume on the statistical aspect of casualties nearly didn't see the light at all and was only saved by **Leishman's** unconquerable tenacity. When the rapid transfer of patients became the rule the Medical Research Council's statistical staff devised an index card to accompany the patient on his travels and to be sent in when completed. This scheme, apparently ideal, miscarried and at the end of the war the central statistical office was inundated with records of every conceivable sort packed in any order. The work was transferred to the Ministry of Pensions to whom a complete register of casualties was essential but only two half-million sets, out of 23 million cards were analysed for casualties man-power and wastage, and purely scientific information was passed over. And so the first object of the volume was never attained. Yet as it stands the achievement is remarkable when it is recalled that 40 per cent of the fighting and nursing services suffered death or some form of war disablement entitling to compensation and we were the first country to publish total casualties from front line to base.

The story of the second world war will be different. Much of it is already there before the war of nerves gave place to fighting with guns. There is a chapter of prophylaxis when women and children were being evacuated from town to country, maternity was being safeguarded regional medical services organised medical education rearranged. The conquest of fear deserves a chapter to itself. The medical boards will have much to tell when their mouths are opened. The penetration of the essentials of healthy living into factory and workshop demands its teller and the end is not yet, closely related is the replacement of men by women in industry, with due regard for their different physical and mental equipment. This is a people's war and its story will recount the metamorphosis of a leisurely and happy-go-lucky community into a rationalised and intensive one. It would be well to put on record now a picture of the transition while it is still fresh in mind, statistical analysis must wait—maybe it will be only an aid to the diagnosis of cultural interpretation. Photographs are no doubt being collected but many of the changes are so subtle as to require the vision of the artist. It is reassuring to learn that the President of the Board of Education will be chairman of the editorial board. The background of the story will be different too. The Ministry of Health—it is difficult now to credit it—is a product of the last war and its chief medical officer, leaving places, names and dates to the lay secretary, has concentrated each year on giving a word-picture of the nation's health, his dual office enabling him to cover school life as well These reports are not being printed in war-time, they have been written and pigeon-holed, and the same, we hope, is true of the detailed reports of the public-health service Nutrition as a science just peeped out in the last war, it will be a turning factor in this one Finally, the story when it comes to be published will be read by all thinking people and should therefore be kept within reasonable limits of size and price For the same tree that has brought forth thorns was correctly stated by the serpent to open the eyes to the knowledge of good and evil

PLASMA PHOSPHATASE

In 1923 Robison[1] demonstrated in the growing bone of young animals an enzyme capable of hydrolysing organic acid-soluble phosphorus compounds into inorganic phosphate This enzyme, phosphoric esterase or phosphatase, was later shown to be present in the kidney, intestinal mucosa, muscle and other tissues Its presence in any organ depends primarily on the functional activity of the cells so that as far as bone is concerned the production of phosphatase is an essential part of the cellular activity leading to deposition of lime When growth is slow and calcification less intense less phosphatase is produced Several varieties of phosphatase exist in the animal body, but the bulk of the ferment found in the blood plasma belongs to the group of the alkaline phosphatases which act best in an alkaline medium The amount of enzyme in the plasma depends on rate of production and the degree to which it is being utilised and fixed in the active tissues As far as plasma phosphatase is concerned the chief source is bone Normally an increased osteoblastic activity is accompanied by quicker bone formation When ossification lags behind cellular activity and phosphatase formation, more ferment spills over into the plasma, so that formation of osteoid tissue is always associated with an increase in plasma phosphatase Values are highest during the rapid growth of infancy and at puberty, and lowest when cellular activity is diminished as in old age and dwarfism[2]

The most obvious application of phosphatase estimation is as an aid to diagnosis in disturbances of bone metabolism Greatly increased values are constantly found in the active phases of osteitis deformans, generalised fibrocystic osteitis, osteogenic carcinoma, osteomalacia and rickets In rickets and osteomalacia serial estimations of phosphatase enable one to assess the response to treatment Indeed, it is probable that in these conditions the level of the plasma phosphatase is the most accurate guide to the degree of activity of the pathological process[3] But the estimation of plasma phosphatase has other objectives Roberts[4] was the first to suggest that it may be used to differentiate between the various types of jaundice Obstructive cases generally yield high values while toxic cases show only a slight increase Herbert,[5] however, has found so many exceptions as to destroy any clear-cut diagnostic value of the test, and further work by Austoni and Coggi[6] and by Morris and Kerr[7] indicates that it is not the presence of bile in the blood-stream but its absence from the intestine that is responsible for the rise in plasma phosphatase Presumably this is due to the defective absorption of lime when bile is prevented from reaching the intestine and the consequent calcium starvation of osseous tissue Recently Talbot and his co-workers[8] in Boston have advocated plasma-phosphatase estimation as an index of thyroid deficiency during infancy and childhood They have shown conclusively that the value is low in cretinism —an indication that osteoblastic activity is very low at an age when the reverse normally holds good They also point out that in idiopathic dwarfism a low level of phosphatase may be expected, and the same would apply to renal dwarfism and cœliac disease in the absence of rickets But to diagnose hypothyroidism simply on a low value for plasma phosphatase may readily lead to the unnecessary, and harmful, administration of thyroid There is, however, undoubtedly a place for this estimation in assessing the progress of a patient under treatment

The discovery by Kutscher and Wolbergs[9] that normal prostatic tissue is rich in a phosphatase with optimum activity at a pH of 4 9 has been elaborated by Gutman and his co-workers,[10] who showed that this acid phosphatase is also formed in carcinomatous prostate tissue and at the site of skeletal metastases, and is found in the serum of these patients Use has been made of this finding in distinguishing between osteitis fibrosa and skeletal metastases due to prostatic carcinoma The differential diagnosis of these conditions is often difficult in the early stages, yielding only to biopsy or long observation In the bony metastases of prostatic cancer the ordinary or alkaline phosphatase value of the serum may be raised just as in osteitis deformans, but in the latter the acid phosphatase lies within the normal range, only when the disease is far advanced does it rise to some slight extent Estimation of the acid-phosphatase concentration in serum should therefore be a useful supplement to the clinical and radiological examination of patients with carcinoma of the prostate, especially if operation is in question, an increased value may be the first indication of metastases in the bones

GLASS WOUNDS

In this war flying glass has been the cause of a distressing number of injuries, especially of the eyes and face, and many of them were preventable Tyrrell,[11] in discussing war injuries of the eyes, pleads for a vigorous campaign to bring the dangers home to the public—out of 25 cases of severe perforating glass injuries 10 of the eyes had been gashed beyond repair And Alabaster,[12] reviewing 100 eye casualties, records that 21 had penetrating injuries due to metal or glass splinters, and that in 12 of these the eye was completely destroyed This year's Ophthalmological

---

[1] Robison R *Biochem J* 1923, 17, 286

[2] Morris, N and Peden, O D *Quart J Med* 1937, 6 211

[3] Morris Stevenson M M, Peden, and Small, J M D *Arch Dis Childh* 1937, 12 45

[4] Roberts, W M. *Brit J exp Path* 1930, 11, 90

[5] Herbert, F K *Ibid*, 1935, 16, 365

[6] Austoni B and Coggi, G *Pr méd* 1934 42 1594

[7] Morris N *Trans R med chir Soc Glasg* 1937, 31 18

[8] Talbot N B et al *Amer J Dis Child* 1941 62 273

[9] Kutscher W and Wolbergs H *Hoppe Seyl Z physiol* 1935, 236, 237

[10] Gutman E B, Sproul, E E and Gutman A B *Amer J Cancer*, 1936 28, 485 Gutman, A B and Gutman E B *J clin Invest* 1938 17, 473

[11] Tyrrell, T M *Proc R Soc Med* 1941 34 725

[12] Alabaster, E B see *Lancet*, 1941, 2 369

Congress at Cambridge took the view that, though eye protection for the soldier had not been favoured by the Military Personnel Research Committee civilians engaged in war duties should at least be able to buy some form of eye protection that could be attached to the steel helmet, and **Cruise**[12] said that half the war casualties which ophthalmic surgeons have to treat might have been prevented by a vizor **Tyrrell** advocates a conservative attitude in treating glass wounds of the eye, for he has been impressed by the better results when operative treatment is deliberately delayed He has found the penetrated glass fragment difficult both to see and to extract, but fortunately it seems to give rise to little foreign-body reaction and the risk of infection is slight **Ballantyne**[13] and **Shapland**[14] agree with him that glass in the vitreous or interior of the eye is better left, but in the anterior chamber or cornea it can as a rule be easily removed The lacerated eyelid **Tyrrell** has found a difficult problem, for there is no excess to permit of a wide excision and tight suturing results in sloughing with sepsis He therefore recommends excising only the obvious ragged remnants, and often does not suture the wound X rays are not always helpful in locating glass splinters in the eyes because the scalp and face are studded with other foreign bodies which overlap and confuse the picture The general belief that only glass containing lead is radiopaque seems however to be wrong, for **Gillan**[15] finds that spectacle glass, window glass, the different types of motor-car safety-glass, and bottle glass will all show up even in the tiniest fragments on a carefully taken radiogram Glass splinters scatter with terrific force when high explosive is behind them **Eden** and **Turner**[16] have seen cases of concussion and contusion of the brain from multiple glass fragments striking the skull with sufficient impetus to drive them right through the bone, their total effect is comparable to a massive blow from a broad object **Zachary Cope**[17] points out that peppering of the limbs by such fragments may produce a severe anæmia from the puncture hæmorrhages These peppered wounds require no debridement or exploration to remove the fragments; careful cleaning of the skin is all that is usually necessary Large fragments of glass—especially those from heavy shop windows—may produce gruesome mutilating injuries and have been responsible for a number of the deaths in thoracic and abdominal cases

The treatment of the limb injuries due to glass is no different from that of other wounds of war, but since the cuts are clean with little ploughing of the tissues, and since clothing is rarely driven in, primary suture of the wound and of any severed tendon or nerve may be justified The decision to do primary suture must however be guided by the time after injury when the operation is done, the experience of the surgeon and the operating facilities available The functional results after successful primary suture of tendons and nerves are undoubtedly more satisfactory than that of later repair As **Mason**[18] says, a tendon is a relatively avascular structure and in its early stages of repair must become attached to the surrounding tissue With a primary suture the surrounding tissue is areolar or fatty, a line of cleavage therefore soon develops and the gliding mechanism of the tendon is now possible If the surrounding structures are fibrous—as after the healing of an unsutured wound—the healing sutured tendon becomes incorporated in this mass and fixed in its course In a study of the results of over 200 cases of tendon suture **Debenham**[19] confirms this, and he says that it is not non-union but adhesions that account for poor tendon-suture results The most certain way of avoiding the formation of excess fibrous tissue is to have a covering of epithelium Thus, even if immediate tendon suture is not possible or desirable, primary closure of the skin will have prepared a suitable scarless bed for the subsequent repair Skin may be sutured up to the 6–8 hour period, but suturing of such an avascular structure as tendon should not be undertaken if the wound is more than 3 hours old For wounds of the flexor tendons on the fingers, where sheath infection may be disastrous, primary suture of the skin only—never the tendon—is probably desirable **Coates**[20] declares that the prognosis of the sutured tendon in the digital sheath is in any event hopeless, but **Mason** takes a more optimistic view and has had a few successful cases More frequent primary suture of the severed nerve also seems desirable because the results of secondary suture are so often disappointing—thus **Stopford** and **Platt**[21] found in the last war that imperfect recovery of function and sensation was almost invariable, even under the most favourable circumstances, after secondary suture and re-suture. **Worster-Drought**,[22] as a result of his experience of nearly 2000 nerve lesions in the last war, holds that though sepsis may develop, primary suture is valuable in keeping the ends of the divided nerves in close proximity With the use of sulphanilamide locally and generally, primary suture will be more often successful, and sulphanilamide does not seem to interfere in any way with nerve repair On the face, where the majority of injuries occur, it will usually be possible to suture the wounds without any extensive excision Strong antiseptics, such as iodine for the skin are to be avoided, and the studies of **Sumner Koch** of Chicago show that cleansing with soap and water is the most satisfactory method of preparation and disturbs the tissues least In suturing, **Kilner**[23] reminds us that a secondary repair can usually be undertaken later, at leisure and with greater care, and with less risk of sepsis or tissue necrosis The chief bugbear of the plastic surgeon in these cases is stitch marks It is important therefore to see that the suture material is fine, that it is inserted near the wound edge, and especially that it is removed early Clumsily repaired face injuries may be particularly mutilating

More could be done in the prevention of glass wounds Even if we are indoors it is well to remember **Mitchiner**'s[24] warning ' When you hear bombs falling in your neighbourhood forget your dignity and fall flat " The steel helmet should be worn indoors as well as outside by those who must work on during air-raids for it has prevented many injuries from glass as well as falling debris The protection of windows by antiscatter liquids, or pasted tape and paper strips, has not proved satisfactory, but transparent films and adhesive textile netting have given good results, the netting being varnished over to prevent trouble from condensation of moisture A strong adhesive netting, if carried over and securely fixed to the window frames, will as a rule hold the glass in the frame even if it is shattered Solid shutters of steel or wood, or loose screens, are apt to become missiles themselves, but it is particularly important in hospitals to prepare beforehand some light wooden frames covered with translucent or opaque sheet materials, which can quickly be put up after panes or whole window frames have been blown out Some hospitals have bricked up the windows of their theatres and resuscitation-rooms and the passages leading thereto In a ward two or three windows at one end can be completely bricked up while the others are only partly bricked, so that during a raid patients can be congregated in the safe end and ventilation is preserved With the removal of patients into corridors, or encouraging them to take such homely but effective measures as getting right under the bedclothes or even under the bed, the number of injuries from flying glass sustained in hospital wards has been remarkably small, though this does not excuse the inadequate precautions that many hospitals in unblitzed areas have so far taken

---

[13] Ballantyne A J *Proc R Soc Med* 1941, 34 730
[14] Shapland C D *Ibid* p 728
[15] Gillan R W *Brit J Ophthal* 1941, 25 117
[16] Eden K and Turner J W A *Proc R Soc Med* 1941 34 685
[17] Cope V Zachary, *Brit med J* 1941 1, 523
[18] Mason M L *Surg Gynec Obstet* 1940, 70, 392, *J Amer med Ass* 1941, 116, 1375
[19] Debenham, M *Calif West Med* 1941 54, 273
[20] Coates J C *Brit med J* 1941 1 212
[21] Quoted by Bristow W Rowley *Proc R Soc Med* 1941, 34, 517 See Stopford J S B *Brain* 1920 43 1 Platt H Surgery of the Peripheral Nerve Injuries of Warfare Bristol, 1921
[22] Worster Drought C *Proc R Soc Med* 1941, 34, 529
[23] Kilner T P *Med Pr* 1941 103 26
[24] Mitchiner, P H *Brit med J* 1941, 1 309

Annotations

THROMBIN AS A HÆMOSTATIC

Morawitz's theory says that blood coagulation involves two stages

Prothrombin + Ca ions + thrombokinase → thrombin
Thrombin + fibrinogen → fibrin

It can thus be seen that thrombin should be an exceptionally powerful coagulant, and Mellanby's[1] preparation of thrombin amply confirmed this forecast If thrombin is injected intravenously it produces general intravascular clotting, and it is therefore only suitable for local use Mellanby's method was not adapted for large-scale production of thrombin, and other local hæmostatics have been proposed, such as Russell viper venom, which, like thrombin, has the useful property of coagulating hæmophilic blood , none, however, have been wholly satisfactory It has long been known that normal serum has a clotting action, and recently Parfentjev,[2] while trying to free immune rabbit serum from this clotting action, isolated a small globulin fraction which had a very high clotting power This fraction acted in the absence of Ca ions and could initiate clotting in plasma containing excess oxalate, citrate or heparin , it could clot blood whose prothrombin had been absorbed, it evidently acted directly on fibrinogen Taylor, Lozner and Adams[3] identified the fraction as a pseudoglobulin and concluded that it was, in fact, rabbit thrombin The preparation always contained a small but irreducible amount of calcium This was insufficient to start blood clotting in the presence of citrate and oxalate and its constancy suggested that it was an integral part of the thrombin Reasonably stable solutions of this thrombin could be prepared and absolutely stable dry preparations were obtained by lyophile drying or by precipitation from acetone and drying in vacuo Lozner and others[4] used this thrombin as a local hæmostatic for small wounds with encouraging results Trials of various methods showed that gauze bandages impregnated with thrombin powder firmly applied gave best hæmostasis As expected, they found that it would stop bleeding from small wounds in hæmophilic patients, even when the hæmorrhage had been going on for some days When teeth had to be extracted in hæmophiliacs a gauze " bite " impregnated with thrombin was applied to the socket immediately after extraction and renewed every 24 hours , complete hæmostasis was obtained and the sockets healed well Taylor and co-workers had previously shown that a globulin fraction which promoted clotting of hæmophilic blood could be prepared from the plasma of various animals, including man , this fraction was much diminished in, though not entirely absent from hæmophilic blood But this particular fraction is a euglobulin, and the thrombin from rabbit serum is obtainable from the pseudoglobulin fraction that remains after euglobulin has been removed by dialysis for 8 days against tap water The euglobulin fraction requires the presence of both Ca and prothrombin before it will clot normal plasma and has been named by Howell " plasma thromboplastin " (or thrombokinase) The antihæmophilic substance of Timperley, Naish and Clark[5] had a protein —egg albumin—as the starting-point of its preparation, but the exact nature of this substance has not yet been determined, nor have other workers had comparable results with it , it was used parenterally, whereas the other protein preparations are emphatically for local use only The thrombin preparation now put forward is certainly worth extended clinical trial, since apart from its application in hæmophilia any agent that can effectively stop bleeding from a wound has obvious topical use It is apparently obtainable with reasonable ease and as it has been prepared from ox as well as rabbit plasma it should be available in useful quantities But as Lozner emphasises, it will have to be used cautiously, since it is very toxic and may result in generalised thrombosis if it is applied parenterally, and he points out that when assessing its value the state of the blood vessels must also be taken into account

INFECTION IN THE BATHROOM

In their report on hospital infection of wounds Prof. A A Miles and his colleagues (*Brit med J* 1940, 2, 855 and 895) mentioned that the inadequately disinfected bath may be a means of spreading infection from patient to patient The cross infection in hospital wards subcommittee of the Preventive Medicine Committee of the Medical Research Council have received the following statement from a medical colleague in which he testifies from personal experience, to the reality of this danger

> I was recently a patient in a large general hospital where I would say that the general standard of care in nursing is unusually high Although a " medical " case, I was bedded, owing to the emergency conditions, in a surgical ward, and I used the common bathroom attached to it In the mornings I took my turn for the bath with a number of ambulatory surgical cases, and on some occasions the congestion was such that two or more men would be in the bathroom at once , while one was bathing, the others would be shaving or dressing It was the ordinary procedure in that particular ward—and, I imagine, throughout the hospital—for the ambulatory and convalescent cases who were permitted, or had been ordered, baths to discard their own soiled dressings on to the floor of the bathroom or lavatory These dressings, often copiously stained with wound discharge, would remain on the floors for at least several hours, until they were swept up by the ward charwomen, naturally without any antiseptic precaution The patients who used the

---

[1] Mellanby, J *Proc roy Soc* B 1933, 113, 93
[2] Parfentjev, I A *Amer J med Sci* 1941, 202 578
[3] Taylor, F H L , Lozner, E L and Adams, M A *Ibid*, p 585
[4] *Ibid*, p 593
[5] Timperley, W A , Naish, A E and Clark G A , *Lancet*, 1936 2, 1142

bath, in such rapid succession that there was no opportunity to clean it between users, included cases of draining ischiorectal abscess (who had been urged to lie there and soak, thereby considerably "holding up the traffic") and cases of partially healed carbuncle. I have myself seen a case of ischiorectal abscess from which sloughs were coming away, followed in the bath—after only a change of water—by another patient. While it may be true that the pus from such granulating wounds is unlikely to be rich in living pathogenic bacteria the communal system under which patients remove their dressings and take their baths in careless proximity is, to say the least of it, unæsthetic and unhygienic, and it is not difficult to imagine forms of infection which might be conveyed by such means. I may add, from my own selfish point of view, that my complaint to the ward sister about the conditions in the bathroom led to my being provided with a generous bottle of a chloroxylenol solution so that I might disinfect the bath personally before using it. On many occasions too, in concession to my medical fastidiousness, the cleansing of the bath was done for me by one of the nurses; but it is quite clear that time and the amount of work to be got through would have made it impossible for the existing nursing staff to give this special service to every patient. The question of whether rinsing out a used bath with a chloroxylenol solution, applied with a brush or sponge, followed by, say, two changes of water, is an effective way of destroying or removing the bacteria which may be caught up in a "soap-ring" raises technical problems which I am not competent to discuss. I wish to make it perfectly clear that I do not suppose for a moment that the conditions to which I have referred are confined to one particular ward or hospital. It is, as I have already indicated, my belief that the standards of nursing and treatment which I received were indeed exceptionally good.

This writer ends by urging that what is needed to abolish a dangerous source of potential infection is the "revolution" in training and education of nursing personnel called for by Miles and others in their report and emphasised in the M.R.C. War Memorandum No. 6 (Prevention of Hospital Infection of Wounds[1]). The teaching of Lister—like his carbolic spray—may have permeated the operating-theatre and penetrated to the ward; but it cannot be said to have penetrated adequately as yet to the bathroom.

HUNTERIAN REMAINS

Last winter's raids took a heavy toll of specimens in the Royal College of Surgeons of England. The record of destruction now appears in the scientific report for the year 1940–41. Most of the specimens had been removed to the basements, which had been reinforced to receive them, but the college was exceptionally unlucky on May 10, 1941, when a heavy bomb struck the museum and store rooms, incendiaries increased the damage, fallen girders broke open the basements below and heavy rainfall on the following days drenched the exposed specimens. The losses were serious but not complete. Thus in the anatomical series (in which there were no Hunterian specimens) 1207 survive out of 2569. In the osteological series only 94 of 1655 Hunterian specimens survive, and 6209 of 15,545 college specimens. On the other hand, the whole of the odontological series—including Hunterian and college specimens—remain. Nearly half the 5400 Hunterian physiological specimens have escaped but only 2026 of the 14,850 college specimens in this series. Of the human and comparative teratological series only 23 of the 170 Hunterian specimens remain, but the college specimens have largely survived. The better part of the Hunterian pathological series remains, though the college specimens have been reduced to about a fifth and the whole of the Toynbee and Strangeways collections have gone; the Army Medical War Collection, as we have mentioned elsewhere (*Lancet*, 1941, 2, 647) has been reduced from 3000 to 100, and is already being replaced by modern specimens. All the mummied specimens and the historical collection are lost and the instrument collection has been reduced from 2500 to 2000. The zoological and anthropological pictures have survived, and so fortunately have Tonks's war pictures. The total loss of specimens amounts to 39,259 out of 65,827.

The task of salvage was a heavy though probably a grimly fascinating one for the museum staff. Specimens had to be rescued from damp, reassembled, placed in new receptacles when necessary, and transferred to safe quarters. Accommodation was found in 17 widely separated places and the American Ambulance Service kindly provided transport.

SALVAGE OF PAPER

We trust the appeal made in our issue of Dec. 27 has met with a ready and generous response. We feel the requirement of the Government is so vital that a further reminder will not be out of place. We stress that a personal sacrifice must be made in the form of giving up not only waste but many books and papers which are only occasionally in use. It is imperative to contribute all possible because the more salvage secured the less pulp in the country will have to be used for "Munitions of War" and so be available for making paper for printing our journals.

MULE-SPINNER'S CANCER

The story of mule spinner's cancer is unsatisfactory because many cases still occur in spite of the known facts about the cause and the methods of prevention—in 1939, 52 cases with 23 deaths were notified to the Home Office. The mule spinning machine was invented by Samuel Crompton in 1779 and was aptly called a mule because it combined the principles of two other machines—Hargreaves's multiple erect spindles and Arkwright's roller and spindle frame. For many years the machines were lubricated with sperm or neat's-foot oil, but in 1850 mineral oil began to be added and by 1875 it was the only type used. Fifteen years later, in 1887, the first case of scrotal cancer in a mule spinner was recorded. In 1906 S. R. Wilson began to study the incidence of scrotal cancer among cotton-spinners admitted to Manchester Royal Infirmary, but it was not until 1922 that he published, with Southam, a full account of the malady with notes of 141 cases. Dr. E. M. Brockbank has now crystallised his wide experience of the problem in book form.[1] As medical referee for industrial diseases he has seen over 180 cotton-spinners who claimed compensation for mule-spinner's cancer, and as chairman of the Manchester Research Committee he has been fully informed of advances in our knowledge of the condition; he has also gained practical knowledge of the cotton trade by visiting the mills and by talking to employers and workers. He accepts the view that the primary cause of mule spinner's cancer is the mineral oil used to lubricate the machines, but that contributory causes may include excessive perspiration produced by the hot spinning rooms; friction of the trousers or overalls on the scrotum, set up by the characteristic forward bending movements that the spinners make in piecing together broken cotton threads; insufficient clothing worn about the groins, and an abnormally dry skin which is sometimes seen in the older workers. Over 80% of scrotal cancers in cotton-spinners are on the left side. This is accounted for by the fact that the mule-spinner repeatedly reaches out his left hand while at work and so brings the scrotum in contact with the thigh and oily trousers.[2] Regular periodical medical examination and early treatment of suspicious lesions are placed first on the list of preventive measures; as an additional precaution Brockbank recommends that only the least carcinogenic oils should be used for lubricating the machines To anyone not acquainted with the cotton trade this looks like putting the cart before the horse and thanks to the work of C C Twort and his colleagues it is cheap and easy to select the mineral oils which are least carcinogenic, There may well be sound technical and economic reasons why non carcinogenic vegetable oils are not used on the mule spinning machines, and perhaps Brockbank will tell us the reasons in the next edition of his book He advises mule spinners to pay special attention to personal cleanliness, to wear more clothing about the groins, and to use protective ointments, particularly when they have dry skins But Dr Watson in his innocence would still ask " Why, my dear Holmes, are men exposed to cancer-producing oils when for many years there have been millions of coconut trees in the South Sea Islands eating their heads off ? " Although the book does not satisfy Dr Watson on this point, its accuracy, clarity and soundness will be valued by doctors and laymen interested in the welfare of cotton-spinners, and should stimulate them to increased efforts to prevent the occurrence of scrotal cancer

---

[1] See also *Lancet* 1941, 2, 565.

[1] Epithelioma of the Skin in Cotton Spinners. London: H. K. Lewis. Pp. 36. 4s.

[2] See also Brockbank, E. M. *Brit. med. J.* 1941, 1, 622.

THE CAUSE OF PINK DISEASE

THE ætiological possibilities in pink disease are grouped by F W Clements[1] in three headings The virus theory is largely based on the occurrence of the disease in mild epidemics to which may be added the fact that it often follows infection of the upper respiratory tract A second theory is deduced from the therapeutic success in isolated cases with vitamin B_1 therapy Against this may be set the general good nourishment of most infants with the disease, which is seen in many breast fed children with no other obvious evidence of avitaminosis Clements thinks that vitamin B_1 may help in the removal of accumulated pyruvic acid and similar substances and so have a definite place in the treatment of pink disease, but that the fundamental cause is not necessarily a vitamin deficiency Writing in Australia, where cereals are extensively produced, Clements is naturally concerned with the theory, originating from Jugoslavia, that pink disease is due to the ingestion of spores of a cereal smut, and this theory is superficially attractive since pink disease commonly appears at an age when cereals loom large in the diet In Europe the smut incriminated is *Ustilago maidis* which usually infects rye, and hence the label coined in Croatia of " ustilaginism " for the type of pink disease found there Clements considered the bunt or stinking smut (*Tilletia tritici*) to be a more likely infection of the cereals consumed in Australia, and he therefore confined his investigations to it Feeding experiments and injections of extracts of spores carried out on laboratory animals, however, failed to produce any toxic or other effects, and he concluded that whatever may be the case in Jugoslavia—where in fact Mayerhofer has drawn a distinction between infantile acrodynia and ustilaginism—there is no evidence that smut-infected cereals play any part in the ætiology of pink disease in Australia Another ætiological theory has been put forward by T A Ratcliffe,[2] who studied 15 cases and was struck by the psychological picture presented by mother and child All the mothers with pink disease in their offspring whom he interviewed were of the " extravert " type, always fussing, taking the child to a doctor on the slightest provocation , the kind of mother who creates the maladjustments of later childhood The striking psychological changes in the sufferer from pink disease are well recognised—the profound misery, anorexia, insomnia, sometimes lethargy of an extreme catatonic type and sometimes almost a maniacal state of increased motor activity Yet sequelæ hardly ever occur so that an organic psychosis produced by encephalitis is unlikely The skin changes, due to peripheral vascular changes, the hypotonia, and the sensory alterations might, argues Ratcliffe, all be of mental origin, so that among the causes of the disease, which he suggests is a syndrome brought about by many factors, he would include a psychoneurosis

---

1 *Med J Aust* 1940, 2, 430 2 *J ment Sci* 1941, 87, 545

SYNTHETIC ŒSTROGENS

IN 1933 Cook, Dodds and Hewett[1] described the activity of 1-keto 1 2 3 4-tetrahydrophenanthrene, the first synthetic œstrogen, and expressed the opinion that " there are grounds for hoping that substances of a much higher order of activity will be found before very long " The search for synthetic substances possessing œstrogenic activity was extended by Dodds and his collaborators and many compounds were found to be more or less active One of these, a derivative of the carcinogenic hydrocarbon 1 2 5 6 dibenzanthracene, had an activity approaching that of œstriol Thus far all the active substances contained the phenanthrene ring system, but in 1936 Dodds and Lawson[2] showed that this system is not necessary for œstrogenic activity The wide field opened up by this discovery was rapidly investigated, and they found that derivatives of diphenyl diphenylmethane, diphenylethane, and stilbene (diphenyl ethylene) were œstrogenic[3] In an attempt at further simplification of the molecule, *p*-hydroxypropenylbenzene (anol) was examined The high activity at first reported for this substance was soon found to be due to contamination[4] It was clear from the high activity of the contaminated anol that the œstrogenic activity of the impurity must be extremely great At this stage Dodds and Lawson at the Courtauld Institute of Biochemistry joined forces with Sir Robert Robinson and his collaborators at Oxford[5] The union was fruitful The fruits were stilbœstrol and hexadiene At the same time an investigation of the active anol contaminant was carried out at the Courtauld Institute, and among the by-products from the preparation of anol was found a highly active substance which was identified as the compound now known as hexœstrol This substance was also prepared independently, and by a different method, at Oxford[6] The activity of these compounds is greater than that of œstrone and compares with that of α-œstradiol Furthermore, unlike the natural œstrogens they are highly active by mouth, a property of great clinical importance Thus in five years the original hopes were fulfilled Three compounds available at the end of that period had activities 300,000 times greater than the one known at the beginning An interesting aspect of these researches has been the activity—albeit small—of relatively simple substances Derivatives of diphenyl and diphenyl ether, for example, have small but definite activity , α and β naphthyl derivatives have also shown activity Recently N R Campbell and F W Chattaway have investigated the effect of substituting such binuclear groups, which seem to confer activity in quite simple molecules, for the 4-hydroxyphenyl groups present in hexœstrol In a communication to the Royal Society they report that such substitutions lead to complete or partial disappearance of activity, and conclude that the 4-hydroxyphenyl group is essential for the high activity of the hexœstrol class The relative potencies of hexœstrol and α œstradiol in the Allen-Doisy test is still a matter for discussion Some think hexœstrol to be slightly more active, others would give it an activity of about a fifth that of α œstradiol It does not

---

1 Cook J W , Dodds E C and Hewett, C L *Nature, Lond* 1933, 131, 56
2 Dodds and Lawson, W *Ibid* 1936, 137, 996
3 *Proc Roy Soc* B 1938 125 222
4 *Nature, Lond* 1937, 139 1068
5 Dodds, E C Golberg, L Lawson W and Robinson R *Proc Roy Soc* B, 1939, 127 140
6 Campbell N R Dodds, and Lawson, *Nature, Lo* 142, 1121 , *Proc Roy Soc* B, 1940, 128 253

appear likely that modification of the structure of hexœstrol will produce a compound of higher œstrogenic activity, but further investigation may bring to light new synthetic œstrogens, possibly of altogether new types, which will be incontestably superior to their naturally occurring rivals

HONG-KONG GONE YELLOW

Dr P S Selwyn Clarke posted us on Oct 1 his latest report as director of medical services in Hong-Kong which was ceded to Great Britain in 1841 and now after exactly a century has passed into the hands of the Japanese It is a mountainous island, about the size of Sheppey, separated from the mainland by a channel from ¼ to 1 mile wide, and made up of bare granite ridges with deep tortuous valleys full of scrub, and a flat fertile coastal strip growing mango pear and orange with patches of rice and sweet potatoes The capital, Victoria, has a fine university, founded in 1910, with schools of anatomy, physiology pathology, and surgery, the last completed in 1934 Around this centre of learning is a Chinese settlement, closely packed with nearly a million inhabitants in normal times and now with another three-quarter million of refugees Last year the food-shortage was reflected in the first recorded outbreak of fatal pellagra (953 cases with 442 deaths) deaths from beriberi were doubled (7229), an outbreak of cholera had a case mortality of 66% and left behind a 20% carrier rate in some districts Smallpox was kept in control by 2¼ million vaccinations The death-rate (uncorrected) from all causes was 56 9 and might have been far higher had not Dr. Selwyn Clarke gained direct control of all the health inspectors He was also reorganising the Chinese hospitals and the welfare centre for mothers and children at Kowloon on the mainland, he had obtained registration of dentists and legislation against spitting In September he was hoping to start a public-health diploma course for local medical graduates This is now all a story that is told and we may trust that whatever has now befallen him and his staff they will know the lasting satisfaction of having set an example of enlightened health administration in an outpost of empire Will the inhabitants still be able to take their choice of Western medicine at Queen Mary Hospital, or Chinese medicine at the Tung Wah and Kwong Wah hospitals? What will be the fate of the pleasant Victoria Hospital for maternity on the slopes of the Peak? Surely the old Government Civil Hospital in among the noises and smells of Chinatown will always be just the same

OVERDOSE OF SODIUM SULPHAPYRIDINE

"It's not what people die from that surprises me," a shrewd Scottish professor is wont to observe in the post-mortem room, "but rather what they live with" The lungs may be riddled with malignant growths, the arteries all but occluded by degenerative changes, and the kidneys may long have ceased to be worthy of the name, and yet life continues to tick over with remarkable smoothness Toxicologists too have been known to complain that people who by all the rules of the game should be dead show an obstinate disregard for "fatal doses" The latest example of this obstinacy is a man who received five times the intended dose of sodium sulphapyridine, and it is interesting to note that, whereas mental depression is characteristic of the toxic action of sulphonamides in moderate doses, in this case poisoning had a delirifacient effect Cutts and Bowman[1] report the case of a labourer aged 26, who after a subtotal gastrectomy for recurrent peptic ulcer developed bronchopneumonia Sodium sulphapyridine by intravenous injection was ordered, but a 5% solution was used in error instead of a 1% solution, and within ten hours the patient received 30 g of sodium sulphapyridine intravenously (20 g at 1 30 P M and 10 g at 11 P M) Ten hours after the second dose the blood contained 29 mg per 100 c cm of sulphapyridine Within a quarter of an hour of receiving the first dose he became extremely restless Next day restlessness was even more severe, he said he could not lie still, but he remained clear mentally Attempts to control the restlessness with hypnotics failed, but apparently intravenous injection of hexobarbitone and other quickly acting barbiturates was not tried Hiccough and vomiting began early and persisted for 36 hours The urine became dark and smoky and was found to contain red blood-cells and acetylsulphapyridine crystals There was no evidence of hæmolysis From the 6th to the 13th day of the intoxication jaundice was present and it can be surmised from the report that it was of the obstructive type due to hepatitis with blocking of bile canaliculi The error in dosage having been discovered by the third day large quantities of fluid were then given intravenously In the first 24 hours of treatment the patient received 7 5 litres of saline or dextrose saline and in the next 24 hours 3 5 litres The urinary output was good, restlessness quickly subsided and the patient began to sleep intermittently He continued to improve and made an uneventful recovery Cutts and Bowman attribute his survival to the fact that he was young and to the prompt administration of large quantities of fluids It is not explained how a 5% solution came to be dispensed instead of a 1%, but no system is completely proof against errors in arithmetic, and the only safeguard lies in conscientious checking of methods and calculations between members of the dispensary staff, especially when potent drugs are being prepared for injection Possibly the routine use of a hydrometer would provide an additional rough check on the strength of solutions And there is no doubt that the pharmacist would welcome the general adoption of the practice of writing in full the strengths of solutions when an error would be fraught with serious consequences, thus "Sodium sulphapyridine for intravenous injection Send one litre of *one per cent.* solution"

Manchester public health committee have chosen Dr C M **Brown** of Middlesbrough to succeed Dr R **Veitch Clark** who has worthily held the position of civic medical officer for twenty years

Lady (**Eldred**) **Horsley**, who died in London on Christmas Eve, at the age of 86, had not only kept alive for 25 years the memory of a great experimenter, but she was the untiring champion of the freedom of research on which Victor Horsley's work was based

Nurses qualifying by examination for the General Register in England and Wales during 1941 were 5353 In addition 1083 qualified for the supplementary part of the register in the following categories male nurses 21, mental nurses 91, nurses for mental defectives 7; sick children's nurses 306, fever nurses 658 A further 82 were admitted to the register by reciprocity—51 to the general register and 31 to the supplementary part

---

Medical Supplies in India.—At a meeting of the Medical Stores Supply Committee held at Simla on Oct 6 it was announced that 60% of these stores as compared with 25% at the beginning of the war, are now manufactured in India Instrument makers have increased their production and it is now only necessary to import complicated instruments such as cystoscopes and microscopes Thirty-one drugs have lately been transferred from the imported to the indigenous category, including liq glucose nicotinic acid, injectio bismuthi and certain bacteriological stains Many rubber appliances used in hospital practice are also now made in India, including operation gloves Important needs still under consideration include tartaric acid, atropine and acriflavine

---

[1] Cutts F B and Bowman R O *New Engl J. Med* 1941, 225, 448

Special Articles

TREATMENT OF BACILLARY DYSENTERY WITH SULPHAGUANIDINE

THE War Office has received a preliminary report from Colonel N Hamilton Fairley and Colonel J S K Boyd on the treatment of bacillary dysentery with sulphaguanidine in the Middle East So far the drug has been reserved for severe and for persistent chronic cases This restriction has often led to treatment being delayed to a later stage than would normally have been chosen Of some 371 cases treated, 135 were cases of Shiga infection, and in this group 96 case-sheets give sufficiently detailed records to permit of analysis The preliminary report only deals with these Shiga infections, as they give an indication of the action of the drug on the more severe type of case

ACUTE CASES

The acute cases of Shiga dysentery are analysed in the table Clinically, the outstanding effects produced by sulphaguanidine are

1 The increased feeling of well-being within 24–48 hours of administration, rapid relief of abdominal pain and tenesmus, and decrease or disappearance of abdominal symptoms

2 A fall in the temperature and pulse rate in uncomplicated cases, often reaching normal in 1–3 days

3 A remarkable reduction in the number of stools, as a rule within 5–6 days the bowels are not acting more than once or twice daily

4 Rapid disappearance of blood from the fæces, mucus also decreases in quantity but usually takes considerably longer before it finally disappears This is not surprising since it takes some time for the pathological lesions to heal and the bowel to be restored to normal after the dysentery bacilli have been controlled or eliminated

The earlier that treatment with sulphaguanidine is begun the less extensive the damage to the colon and the more rapid the convalescence and recovery The most dramatic cures are naturally found in acute cases treated within 24–36 hours of the onset, in most cases in the Middle East treatment has not been started until after the 4th day of the disease

NON FATAL CASES OF SHIGA DYSENTERY TREATED WITH SULPHAGUANIDINE

Days between onset and beginning of treatment	Cases in group	—	Av age (yr)	Av no of stools in 24 hr preceding treatment	Av time (days) after treatment was started before stools were		
					3–5 per day	2 or less per day	Formed
1–5	39	Shortest Longest			1 10	3 12	3 17
		Average	25 2	27 8 (34)	4 (26)	5 3 (33)	7 7 (30)
6–10	32	Shortest Longest			1 10	2 11	2 14
		Average	25 7	21 7 (32)	4 (27)	5 4 (30)	7 15 (20)
11–20	13	Shortest Longest			1 5	1 10	5 14
		Average	29	14 1 (10)	3 (8)	5 (9)	8 3 (9)
21 & over	12		30	Not capable of tabulation in this way			

In certain of the case sheets one or more of the data which have been tabulated have been omitted The numbers from which the averages were struck are shown in parentheses There is no reason to think that those which are omitted deviated greatly from the average This applies equally to the 39 cases not included in the table

SUBACUTE AND CHRONIC CASES

Of the 12 cases shown in the table, 3 have been recorded as possible failures

In the first of these, sulphaguanidine was started on the 69th day of the disease Sigmoidoscopic examination revealed a few inflamed patches high up in the bowel Culture at this stage was negative though *Bacillus dysenteriæ* Shiga had been isolated at an earlier date The course of treatment given was less than the standard advocated After treatment the stools still contained clear mucus The mucous membrane showed no definite ulcers, but one rather raw looking area was present in the rectum The mucosa of the sigmoid colon was generally healthy, but some areas were œdematous with a tendency to bleed at the summits of the valves Culture was still negative Looseness of the bowels with mucus persisted for some weeks, the bowels acting 4–6 times daily Healing here was incomplete, but there is no bacteriological evidence to show that this was due to persisting Shiga infection

In the second case treatment was started on the 42nd day, after the patient had relapsed A complete course of treatment was given without controlling the diarrhœa Data regarding the further course of this case are inadequate

In the third case, *B dysenteriæ* Shiga was isolated on the 9th and 38th days Sulphaguanidine was begun on the 41st day The patient received 96 g in the next 5 days (an inadequate course) The stools became normal but relapse occurred Sigmoidoscopy revealed a small red area on the second valve of Houston which bled on swabbing On the 69th day a second course was started (72 g in all given) Thereafter the raw area healed and the patient was discharged on the 98th day It is probable that a full course of treatment in the first instance would have produced cure

In the remaining 9 cases results were very good In 7 the stools were normal in an average of 8 (limits 4 and 18) days after beginning treatment The eighth was a case of special interest which will be recorded in detail in the final report The ninth (a case of 4 months' duration before treatment was started) improved rapidly and healing occurred within a fortnight of sulphaguanidine being given

FATAL CASES

In addition to the cases recorded in the table case-notes are available on 5 fatal cases in which sulphaguanidine treatment was attempted In 2 the patient was moribund before treatment was started, and not more than 12 and 14 g respectively was administered A third was cured but died of cerebral thrombosis, at autopsy the bowel was found to be healed, pyelonephrosis of the right kidney was also present The other 2 cases were apparent failures, but one had advanced bilateral hydronephrosis and the other died of lobar pneumonia, which developed shortly after sulphaguanidine treatment was started In both cases information is lacking in regard to the duration of treatment and the total quantity of sulphaguanidine administered

COMMENTS

Although no analysis of cases other than Shiga infection is given, cases of dysentery due to Flexner, Schmitz and Sonne infections treated with sulphaguanidine have been restored to health, and rapid healing of the various types of colonic lesion has been observed by the sigmoidoscope The fatal cases have either received treatment too late or have suffered from some complication such as pneumonia, peritonitis or toxic nephritis established before treatment started

The action of sulphaguanidine is either bacteriostatic or bactericidal It leads to a cessation of damage to the gut and to an immediate decrease in the production of toxin, as manifested by the rapid improvement in well-being It appears to exert no effect on dysentery exotoxin already absorbed and circulating in the blood, but in Shiga dysentery at least this can be neutralised by the intravenous injection of Shiga antitoxin Viewed from this standpoint, sulphaguanidine which is bacteriostatic, and Shiga antidysenteric serum which is antitoxic, are mutually complementary in action The outstanding indication for the administration of Shiga antitoxin is fulminating Shiga dysentery in which it is imperative that circulating toxin should be rapidly neutralised.

The toxic manifestations encountered have been mild They have consisted of headache associated with malaise and an occasional transient erythematous or red papular eruption No case of hæmaturia has been recorded, and the toxic nephrosis (toxæmic nephritis) which has not infrequently complicated bacillary dysentery has no relationship to the administration of this drug since it occurs independently of sulphaguanidine administration

The report ends by emphasising that the cases under treatment were as a rule selected be[illegible] of their seventy and that although all fatal cases have been recorded and included only a limited number of the successfully treated case have become available for analysis

WOMEN AND CHILDREN: A RETROSPECT

ADDRESSING the National Council for Maternity and Child Welfare on Dec 10 the President of the Royal College of Obstetricians and Gynæcologists told them that their movement was so young that he himself could remember its beginning In the first decade of this century he was resident at St Mary s Hospitals Manchester, when J W. Ballantyne launched his campaign in Edinburgh for better antenatal supervision and met with opposition ridicule or faint praise But today our maternity and child welfare service is built on the fusion of this medical work with a social movement which began about the same time when groups of educated women who wished to raise the standard of mothercraft founded schools where mothers were taught how better to care for their children After finishing his resident maternity work he was a member of one of the earliest of these committees. The schools were at first run on a voluntary basis but soon they became too large for voluntary effort, and they were adopted by the local authorities - After the 1918 Act the voluntary basis disappeared in most areas, and today most of them are administered by a paid staff

Prof Fletcher Shaw recalled how thirty years ago the women waiting in the outpatient department of a women's hospital were generally dirty bedraggled and looked much older than their years. They wore ragged, soiled garments and their underclothes were pitiably deficient A patient often objected to expose the other leg arm or breast for comparison with the injured one which had been carefully washed Now the crowd in the outpatient hall differed little in dress from those in the private waiting-room The white coats once worn for their own protection by medical officers are now worn to protect the patients Again thirty years ago epidemics of infantile diarrhœa made the hot dusty summers a nightmare Chubby, healthy infants and toddlers were stricken and in an incredibly short time became pale emaciated, blue-lipped apathetic moribund With their unsuitable contaminated diet long-tubed unsterilised feeding-bottles, and rubber comforters picked straight off the floor, it was not surprising that these children were infected In answer to a question as to what her child was fed on a mother once replied: "Ay doctor it has just what we have and it'll sup beer as well as thee will" Today infantile mortality is a third of what it was then and though control of flies dried milk, re-housing, sanitation, and the development of public health claimed their share in this improvement the teaching of mothercraft had played a notable part But how much remains to be done was exposed by the first war-time evacuation.

On the antenatal side he did not think they had done so much Maternal mortality was often taken as the one criterion of maternity work but it is only one although the most obvious and readily available, and for every woman who loses her life in childbirth there are many who date ill health and disability from the same process Antenatal supervision had helped to control the incidence of eclampsia and to reduce the number of fistulæ and other obstetric injuries—another reason for this reduction was the better training of medical students—but until those responsible for this supervision were attached to the maternity hospitals and knew the result of every case which had been under their care we would not get full value from antenatal supervision

War has brought us problems and peace will bring us more; one of them Professor Shaw suggested, may well be to increase the number of children in the families To do this we must see that every woman is cared for in pregnancy labour and the puerperium and every child from the neonatal period onwards and we must be able to hold out a reasonable certainty that the mother will return to her normal duties not only alive, but undamaged It must be our aim to get every pregnant woman under observation; for there are still too many whose difficulties are recognised only when they are in labour The greatest confession of bad treatment in obstetrics is the case of failed forceps and our maternity hosp[illegible]ll receive as many as they did twenty years ago Though the increase in the number of maternity beds had been enormous, we still had not enough to meet the demand for institutional treatment and in making plans for the future we must be prepared for still greater expansion From the woman s point of view he thought there was much to be said in favour of the institution. Small homes in which women now take an increasing pride do not lend themselves to obstetrics any more than to surgery and it is more restful for the mother to be in an institution where everything is done for her and where she is free from household worries

At present it is left to each local authority to provide its own accommodation In large industrial areas it is simple to provide one or more hospitals with trained staffs who will get sufficient work to keep them in good practice But in areas with small scattered populations the system is impracticable, and a patient may not be moved even when the adjacent local authority can provide much-needed help which is unobtainable in her own area Regionalisation the solution sponsored by the Ministry of Health would divide the country into larger areas where it should be possible to establish adequate hospitals with trained staffs but to maintain a perfect obstetric service there must be team work between the public-health services obstetricians maternity and child welfare workers and midwives Your share in maternity work Professor Shaw concluded is recent but it is of vital importance As the maternity services of the country grow, so will your opportunities and responsibilities

DRUG SUPPLIES FROM THE EMPIRE

THE entry of Japan into the war will interfere with our future supplies of such drugs as menthol camphor, agar-agar and quinine, and we must look more to the Empire as a source of them than we have done in the past. Can the Empire supply them and why do we not produce all the drugs we need within it? These questions were discussed on Dec 16 by Mr Maurice Ashby, PH.D in a lecture to the Dominion and Colonies section of the Royal Society of Arts Before the war a large proportion of our drugs came from countries outside the Empire, and Central Europe was our main source of digitalis and solanaceous herbs Consumption of some drugs has been cut down and the Medical Research Council's memorandum on economy in the use of drugs in war-time, in conjunction with the newly published National War Formulary, will effect further reduction But quinine and ipecacuanha, to combat malaria and dysentery, are likely to be needed in increased amounts by our Forces in the tropics

From a cursory inspection of the map of the Empire it looks as though climates of any type are "on tap" but to transfer medicinal plants from their original habitats to an analogous climate in another part of the world is by no means a simple matter These plants are grown for their alkaloidal, glycosidal or oil content, and a slight reduction in the percentage obtained from the plant may make their production on a commercial scale too costly The same botanical species found in different parts of the world may show varying physiological properties One of the basils (*Ocimum gratissimum*) when grown in the Seychelles yields an oil rich in eugenol, but the oil obtained from the same species grown on the Ivory Coast contains chiefly thymol Another species of basil when harvested in August has been known to give an oil containing only 47% of camphor whereas plants harvested two months later have yielded over 70% Even excess of rainfall may alter the percentage of active ingredients and after a single rainstorm the ephedrine content of ephedra herb is temporarily reduced These factors all play an important part in deciding whether commercial production is worth while

The Empire is a rich potential source of most of the drugs which are required, but in many cases collection in the past has been rather haphazard and little thought has been given to future supplies In Canada cascara has been harvested by completely peeling the bark from wild trees, and this wasteful process causes the death of the tree Planting and cultivation are now being undertaken based upon a pruning system by which one branch is peeled each year and the tree kept alive Cascara bark must be stored for at least a year before it is used in medicine, because fresh bark causes severe griping , so that at least five years must elapse between planting and the preparation of a medicinal extract This wholesale destruction of trees will cause supplies to be less plentiful for some years to come The world has hitherto been dependent upon Japan for its entire supplies of agar-agar, but an attempt is now being made to gather the necessary seaweeds from the waters around Australia and New Zealand Bacteriologists require two to three tons of high-quality agar annually for culture media , it is to be hoped that this quantity can be obtained from the Antipodes After the dearth of ergot two years ago experiments were set on foot in Australia, at the request of the British Government, for the production of ergot by spraying rye with a suspension of ergot spores In some cases a good yield of ergots has been obtained, but owing to an exceptionally dry season the results have been rather disappointing In Australia also there are over two hundred species of eucalyptus, many of which yield oils of medicinal value One of these *E dives*, gives an oil rich in piperitone from which synthetic menthol and thymol are manufactured New Zealand is a possible source of many of the drugs which were formerly imported from Central Europe, but the high cost of labour would make production too expensive , however, experimental work is being carried out with a number of drug crops to determine what this Dominion could contribute in an emergency

India is our richest actual and potential source of drugs within the Empire *Podophyllum*, *belladonna*, stramomium, liquorice, squill and valerian are received regularly in London and the lower slopes of the Himalayas offer fertile ground for further crops Karaya gum is proving a satisfactory substitute for the more costly tragacanth and gum arabic, and Indian colchicum is finding its way into medicine Cinchona cultivation is rather disappointing, and for many years Java has produced over 90% of the world's supplies of quinine-containing bark Difficulties of finance and organisation have prevented expansion of cultivation in India, and the bark with the richest alkaloid content, *Cinchona ledgeriana*, has not taken to the Indian climate and soil The bark now harvested there is used for local consumption and about 5000 acres only are under cultivation out of 38,000 acres regarded as suitable for the crop South America is still the chief source of ipecacuanha, and the species required by the Pharmacopœia is grown exclusively in Brazil There are flourishing crops in Bengal and Madras though the total quantity produced is small The area under cultivation is being increased but the crop is difficult to grow and takes three years to reach maturity, so development is necessarily slow The West African climate is unsuitable for drug production but East Africa, with its white planters and wide range of climate, has been the scene of numerous experiments in drug cultivation, with varying results Peppermint has been attacked by a mint rust, which has proved difficult to eradicate, and cascara trees by a fungus The quality of the cascara bark, however, falls little below that of the Canadian material and attempts are being made to improve the resistance of the trees by grafting them with a hardy local species of rhamnus Success has been achieved with ephedra and with the basil previously mentioned , and last year pyrethrum to the value of 2½ million dollars was exported to the United States for use in insecticides

Production of the major portion of our needs within the Empire seems possible but, in the light of what Dr Ashby tells us, is only to be achieved by a long-term policy of production and guaranteed economic security *for the commercial producer*

Dr F A Sharpe in his annual report for the county borough of PRESTON records a slight rise in the birth-rate to 15 77, the highest rate for 11 years , a sharp rise in the death-rate from 12 52 to 14 96 (corrected 16 72) , a heavy increase of infantile mortality from 58 to 91, and a high maternal mortality of 7 03 These two adverse rates are in part attributable to the employment of mothers away from home There was a rise in tuberculosis notifications from 122 to 151, but a fall in deaths from 88 to 71 Cerebrospinal fever caused 13 deaths, but the only information of its incidence given in the report is that 13 cases (1 fatal) were admitted to the isolation hospital

In England Now

A Running Commentary by Peripatetic Correspondents

THE second course of instruction for Home Guard officers ended at Cambridge just before Christmas We all lived in college and took our meals together in hall From 9 A M till late at night the forty of us were forcibly fed with every variety of knowledge likely to be useful to a Home Guard When our official instructors ceased their labours we held meetings of our own to crystallise ideas for presentation to authority Then came the meeting, attended by persons of eminence in the civil and military medical services, at which we were invited to bring out our questions We thought the answers were not very satisfactory The possibility of invasion, we found, was not so stimulating to the civilian authorities as most of us desired, though the Army medical services seemed fully alive to the problems which might arise The high spot was reached when opinions differed over the question of whether the chief medical officer in each zone (known as the zone medical adviser) should be the county medical officer of health or some veteran of the last war with both military knowledge and habitual independence The platform affirmed that the M O H was the right person, but was eventually harassed into asking for a vote on the subject , 37 of the 40 students voted against the M O H The remaining 3, who voted the other way, were medical officers of health themselves

We were told over and over again, in the united voice of many military authorities, that we were front-line troops , we were even told that we were the salt of the earth We were just feeling solemn over our high dignity and purposes, and much encouraged to persevere, when the cold voice of regional authority remarked that we might be sent hither and yon at the dictate of any M O H who esteemed his work more important than our own There was nearly a riot But there is a serious point in all this arrangements have certainly been made for the disposal of the services of general practitioners in emergency, and the profession is supposed to have been consulted , but no effectual contact has really been made with the average general practitioner The Home Guard has not been approached, and the Home Guard directorate contains no medical officer with actual experience of Home Guard service, able to resist the wiles of the Ministry of Health Clearly it may be necessary in emergency to commandeer the services of medical men for duty in areas other than their own, but the existing machinery will almost certainly fail to achieve that end , doctors holding His Majesty's commission in the Home Guard will not take orders from other than military commanders, and it is no use replying that they can be forced to do so General practitioners are unaccustomed to being forced to forsake what they consider to be important duties, and the atmosphere of actual invasion will certainly not be one in which they are likely to begin obliging in this way This feeling was clearly emphasised in hundreds of conversations between the officers attending this course

Our last evening together witnessed a certain freedom of demeanour, but we returned home next day with eyes opened to our duties in conditions which may prevail during invasion, and probably twice as efficient as we had been when the course opened

* * *

" Here is my M I room," I say to Durrant, who takes over tomorrow " I call it *my* M I room because I watched it grow during no less than six painful months , I rescued it from the frightful doom of unimaginative *service brown, insisting* on cream paint and—well, any way, I work in it But the contractor calls it his because he built it, adding a few more feathers to his nest , while every battery commander who comes out here lays claim to it, alleging that the original idea was a child of his brain , and finally, if they were asked, I have no doubt the war-lords would *tell* you it is theirs because they signed for it Take your choice But, of course, henceforth it becomes *your* M I room " Durrant s apparent lack of enthusiasm on first beholding the bright gleaming hall of medicine is to be forgiven , after all he has *only* just come from a hospital where the magnificence of the interior decoration is well able to stand comparison with this pawky room stuck on a rock jutting o [illegible] the sea

"Good morning, corporal, how many sick today?" "Only Benstead, sir, with another boil, and two men for injection." Durrant's face falls. "Is that all you have to deal with?" he asks. "Not quite, but this is the time of year when one expects men to be reasonably fit, hence small sick parades; in another month or two the numbers will bump up a bit. And I guess you will have a good deal more than this in the next few days; they always try to swing it over the new doctor. It rarely pays them in the end, of course, but they persist in their opinion that it's worth a shot. But this sick parade is almost the least important part of the job, provided that one keeps a sharp watch for the gallant fellow who makes out that his illness is of no account; as often as not that is the man who is liable to be very ill. What matters is to keep the men fit, and that nearly always boils down to keeping them happy and their minds occupied.

"Out here they don't see a tree or a blade of grass from dawn to sunset. Before Hitler engulfed France it was comparatively easy; they all had so many days ashore per week, and many of them could sleep ashore one night a week; but until very recently all that was necessarily stopped. It amounted to this: without having committed any sort of crime they were all perpetually confined to barracks. The situation is easier now with the chance of an occasional week's leave, but at one time sick parades increased steadily in size and strangeness, apparently fit men quite genuinely producing the most amazing and sometimes alarming symptoms—exhibiting, in fact, the major signs of that wretched disease '*ennui*.' We conferred at length on the subject and invented a variety of means to stimulate interest, until now it is fair to say that morale is back on the high plane where one tries to keep it. A medical officer must constantly mix with the men, talk to them and, above all, listen to them; keeping a watchful ear for the first signs of unhappiness; more often than not he can put in a word in the right quarter that will nip trouble in the bud, and help in a humble way to keep a unit cheerful in dull days. He has a great opportunity in a small sphere within the Army to look beyond the manifestations of disease. Benstead's boils are an example. It isn't unusual, in a unit of this size, to find one man whose boils are resistant to treatment at the start, but at my first sick parade on this fort there were half a dozen men with boils or other minor but irritating skin conditions. It was the depth of winter, and the supply of fresh vegetables had been eliminated by frost. After a good deal of amused backchat on the part of the 'Q' side, and a heated affray with one commanding officer who mistrusted me as a harbinger of 'sloppy soldiering,' we managed to obtain a regular supply of oranges until the spring, and the plague of minor complaints subsided. In fact one might go so far as to say that the whole object of a doctor's existence in this type of job is to have nobody on sick parade at all." Durrant looks disheartened.

"But it's doubtful," I hasten to add, "whether one could ever achieve such a desirable state on this particular fort, because with infinite trouble I have now induced such a high degree of 'inoculation-mindedness' in the sergeant major that he always contrives to bundle one or two men into M.I. room for injections. However, don't allow yourself, as I once did, to be overwhelmed with enthusiasm and try to get the whole business cleared up in a week. One morning a large supply of calf-lymph arrived and, after a long harangue on the worth of vaccination (which is, of course, voluntary) and after assuring my victims that it would not protect them against the common cold, typhus, plague, influenza, hammer-toes or a hundred other ills (for prophylaxis against which they professed that they would willingly consent to any torture), I eventually persuaded a large horde, including some officers, to try it. A few days later I trembled in front of an explosively indignant and serious-minded commanding officer, who had discovered that if Hitler chose to come that night he would find half the unit nursing arms of raw beef and rising temperatures, almost incapable of fighting the guns; and did I realise that I, a mere non-combatant, had put the entire coast in jeopardy? All I could do about it, of course, was to write a stiff letter to the vaccine merchant. He was particularly interested, as he told me in his reply, because my story tallied with many similar experiences at about the same time, and he hoped that I would let him know when it happened again."

"All the same, the morning's work doesn't seem to take very long," says Durrant, still inclined to decry his new job. I try to fill in the apparent gaps in the day's routine. I point out that, for one thing, this is only the first of the chain of forts for which he is responsible. "When do you visit the others?" he asks doubtfully. "When they send for me and if I can get a boat." Again I sense that he feels he has shattered the illusion of work, but at this moment a squad of men march into the room, seize a stretcher and haversacks of equipment and march out again. I take Durrant outside to watch them demonstrate their prowess at first-aid, and tell him that each morning he must take a squad from the off-duty watch and train them in stretcher-bearing, including the gymnastic feats required to move injured men from some of the most likely but least accessible parts of the fort. I also warn him that the colonel is apt to hurtle out in his speed-boat at any moment, declare war, and expect the M.O. and his myrmidons to treat and remove to safety any casualties that he may care to create. The potential arrival of the colonel is as a sword of Damocles hanging over the heads of the garrison. No matter how rarely the thread may be severed it serves to maintain a high state of vigilance, because to those who are caught unprepared these visits can be even less desirable than a visit from the enemy.

While Durrant is thinking this over I hasten to thrust home one or two more blows. This state of preparation, I point out, has to be induced and maintained on all the other forts too, and though it can be done easily enough on this fort in the morning the M.O. has to get down to it again in the afternoon at one of the other sites, at times when the men are free of other duties. He is also the local public-health department, and at least once a month must inspect and report on the health of the men and the sanitary state of their surroundings—an inquisitive job. The first task is easier here, cut off from land, than ashore, because the men can strip in the open air in good sunlight and the M.O. can swiftly tell if anybody is harbouring any of the more intimate and irritating insects. This monthly inspection is an ideal opportunity for checking up on any man who may indulge a distaste for soap and water; as the man turns away the neck comes prominently into view. If there is any cause for suspicion the man is questioned straightforwardly about his ablutionary habits. If the answer is unsatisfactory, his name is handed to the sergeant major with a definite warning that any recurrence will be dealt with summarily. On a sea-girt fortress it would be simplicity itself to put this warning into practice—the miscreant would be thrown into the sea without further ado and coram populo. There may be two reasons why I never had to put this dire threat into execution. In the first place men hate to have among them any of the great unwashed, and once attention has been drawn to such a man one can depend on his associates to keep him up to scratch for the rest of his Army life.

But this did not altogether explain it, so when after several months no man had been caught twice and when, indeed, there were no more offenders, I asked the sergeant major if he could offer any further explanation. "I don't know exactly, sir, but it may be because of what happens after you give me their names, sir." The twinkle in his eye at this stage compelled me to the silence which would rank as permission to carry on. "What actually happens, sir, is this. I tell them to parade at fourteen hundred hours sharp outside the battery office, and after allowing them time to reflect and cool their heels for five minutes or so, I open the office door and without so much as a by-your-leave as you might say, and without bothering to lower my voice, I simply give them a brief outline of the more elementary principles of hygiene." While he pauses to refill his lungs I imagine with mirth the trumpeting tones of that gargantuan voice, with its ripe southern county intonations, crashing, resounding and echoing up and down and round and round the interior of the fort, informing the world that Gunners Smith and Jones have failed to wash their necks. He continues, "I then summon a couple of likely-looking fellows to conduct the aforesaid gentlemen to the showers, and I have heard that when they arrive there they are stripped and scrubbed ' No, they never tried it a second time

The second monthly inspection is of the men's barrack-rooms, the cookhouse, their ablutions—in fact of their whole domestic scene The battery commander on each fort accompanies the M O followed of course by the sergeant major , and with the cooperation of these two dignitaries there are many small ways in which the M O can improve the comfort and living-conditions of the men The secret of this inspection is to keep a sanitary diary , a correct Army Book exists for the purpose but any fair-sized notebook ruled in three columns will do In one column the M O notes any improvements he thinks necessary the battery commander adds his notes alongside and finally the M O inserts in the third column at a later date when and if anything has been done about it This diary is passed right down the line each month and is the cause of considerable competition between the forts concerned One of the officers complained that I had given his unit the stick for three successive months while appearing to be sublimely indifferent to the disgusting state in which X (his great rival) kept his fort I dared not point out that the facts spoke for themselves

* * *

" Where the Ward Round Rubs " reminds us forcibly of the need for cautious utterance and behaviour at the bedside Too often we forget that the obliging provider of physical signs is a sentient being acutely interested in his illness and in everything which is said about it I remember being taken aside when a very raw dresser and being firmly told by the Chief that " cancer " was always " neoplasm " in the patient's hearing, and I can vividly recall the horror in the faces of a mother and her strapping schoolboy son with a patent interventricular septum when an exhibitionist senior physician described graphically the serious risk of infective endocarditis, of which he knew I was well aware What a lot a word of explanation can do to allay the terror of the unknown What looks of frightened suspicion are cast on a negligently brandished patellar hammer until its innocent purpose is realised, and what dread of imminent electrocution dismays the timid old lady attached to the electrocardiograph when the hurried operator has omitted his stereotyped reassurance The electrocardiograph reminds me of the much-demonstrated patient with coronary thrombosis who cheerfully remarked, " My word, you've got to mind your P's and Q's here ! " and immediately fell back dead

---

MILK AND EGGS FOR INVALIDS

On Dec 11 the Ministry of Food made known by public advertisement the diseases and illnesses for which special supplies of milk are available to invalids on the authorisation of a medical practitioner (see *Lancet*, Dec 27, p 809) Similar publicity was given on Dec 28 to the priority supply of eggs Four eggs instead of the normal allowance of one will be available at each distribution to invalids suffering from

Gastric, duodenal or anastomotic ulcers Post operative conditions after an operation on the stomach or duodenum

Disease or injury to the mouth, throat or gullet

Typhoid or paratyphoid fever, and amœbic or bacillary dysentery under treatment in hospitals, &c

At the same time Lord Woolton made an appeal to the public to respect and support the high standard of professional conduct among the certifying doctors " I have asked people," he said, " to restrict their use of milk for a few weeks in order that those who really need it should get enough It is a small sacrifice compared with the sacrifices men are making every day in the fighting services Therefore I ask those who want more milk, and think they may be able to get it with a medical certificate, not to burden the energy and conscience of a great profession already vastly overworked, by making unjustified claims for priorities I ask them only to apply for these certificates when they can conscientiously say they require them, and not as a means of getting round the restrictions "

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS M P

On Tuesday, Dec 16 Mr H B Lees-Smith was in his place on what is still known as the front opposition bench and asked the Lord Privy Seal to state what was the business to be brought before the House On Friday his death was reported to the House, as all deaths of members are, by Mr Speaker, and Lord Winterton and others paid tribute to the man who will perhaps best be known in the future as one of the founders of Ruskin College at Oxford, but to all M P s as a great authority on procedure and as a pillar of the Labour Party To those who saw Mr Lees-Smith earlier in the week he seemed in his normal health but all in Parliament are under a severe strain

* * *

Mr Lees-Smith's last public appearance brought forward, among other items, the announcement of a debate on the war arising out of the situation in Malaya and the loss of the *Prince of Wales* and the *Repulse* The debate took place on Dec 19 immediately before the adjournment, but as it took place in secret any comment will have to be postponed until it ceases to be a matter of current history But before the debate became secret there was a significant challenge to the Government on their proposal to adjourn the House until Jan — This was resisted by Mr E Shinwell on the ground that when so many urgent questions require discussion and when the war situation is so delicate so long an adjournment was not advisable Mr Shinwell proposed an amendment to adjourn the House until Jan — and he was supported by Sir John Wardlaw-Milne Other Conservatives also supported Mr Shinwell as did Liberals and most of the Labour Party If Mr Attlee would not accept the amendment Mr Shinwell proposed " with the help of my honourable friends " to divide the House The dilemma was clear and a threat of a defeat in the division lobbies clearer Mr. Attlee went into a front bench consultation with the Chancellor of the Exchequer on one side and Mr James Stuart, Conservative chief whip, on the other But the crisis was not solved by these three alone Captain H D R Margesson, now War Secretary, but for many years Conservative chief whip and director of much of Conservative tactics in the House, dived into the huddle Mr Attlee was seen industriously taking notes and in a few moments he rose and said that as the Government always wished to meet the views of the House he would agree to accept the amendment On which the Speaker put the vote formally and Jan — it is The Government has been shaken—the experiences in the Far East too painfully recall earlier experiences in France, Norway, Greece and Crete and the House was in no mood to accept the Government's ipse dixit " Even if," as was said, " we may have to meet on Christmas day "

* * *

The week began by the Chancellor of the Exchequer informing us that we were now spending £83 million a week and that the vote of credit which he presented was the fourth billion-pound demand for the year With regard to savings the Chancellor suggested that about a third of our people are saving on a scale that is fully adequate, another third on a reasonable scale, but the last third is not saving at all But Sir Kingsley Wood refused to specify to what sections of the community his remarks applied The interest of these figures—rough as they are—lies in the fact that it may be necessary to introduce more stringent measures to ensure saving The introduction of a new special security which can be tendered in payment of certain taxes may be not unconnected with this , the necessity of correcting " the excess of purchasing power " and of " an elaborate system of controls and rationing " of commodities were dealt with and attention called to the " steadiness " in the cost of living, the maintenance of peace-time social services and the low interest paid on loans But " the price of our economic security is unrelenting sacrifice "

Mr F W Pethick-Lawrence spoke in the same way, " if once saving were inadequate to fill the gap between

Mr Pethick-Lawrence said that for the poorest people in the community, those at or below the poverty-line, saving was not possible And for manual workers above the poverty-line, "to sacrifice the standard of life which makes for the full health and efficiency of themselves and their families would be a grave blunder" To make saving effective there should be double the amount now put aside But the question is one which is very difficult to solve without some form of compulsion There are for instance the black-market gentry

Mr Graham White drew attention to the German practice of complete rationing, price fixing and wage stoppage "over the whole field from the very outset" The motion passed, of course, and without a division, but the existence of large numbers of people at or below the poverty-line is a grave weakness in a time of national peril

* * *

Not unconnected with these reflections is the introduction of the Education (Scotland) Bill by Mr Tom Johnston by which he said the Government were "exceedingly anxious to make a big new advance in nutrition.' "I believe," he said, "that the science of nutrition will do for public health what sanitation did for it in the last half-century" The bill was necessary because the aim of the Government was "to prevent malnutrition instead of trying to remedy it" It is, however, a late awakening As Mr Kenneth Lindsay, formerly parliamentary secretary to the Board of Education said, "it is rather ironical that it has taken not one war but two wars . . to make the people of Scotland wake up to this public scandal" of underfeeding But the question remains—will the school feeding be properly carried out? For that we must wait and see

* * *

So the House after another day devoted, before the secret session, largely to the Home Guard, has again adjourned But it will soon meet again, and there may be in 1942 plenty of work for the Home Guard

FROM THE PRESS GALLERY

Immunisation against Malnutrition

ON Dec 16 the House of Commons turned "from the sombre and enthralling present to plan for the future of little children," when Mr T Johnston, the Secretary of State for Scotland opened the discussion on the second reading of the Scottish Education Bill He said there were few immediate and practical measures in public health which he could commend to the House with better heart He recalled how the foundations of the milk in schools scheme had been laid on the results of the milk-feeding experiments in Lanarkshire in 1930, which started with 20,000 school-children School-feeding was especially desirable now when many mothers were at work, also its cost was low and it conserved food In Glasgow children get a substantial two-course meal for 4½d, in Edinburgh and Dundee for 4d, and in Aberdeen for 3d The Government did not want to begin a school-feeding system on a high-charge basis They did not want school authorities to make profits They were anxious that it should be a nutrition experiment which would prove to be a definite advance in human well-being He hoped that before long 20% of the children attending schools in Scotland would have a hot midday meal They aimed at reaching the highest possible nutritional standard at the lowest possible price for the maximum number of children He would also like to encourage the teaching of cookery. The Oslo meal system where it had been tried in Scotland had not commended itself entirely to the school-child, who regarded a vegetarian diet of that kind as not very appetising Anyhow the Oslo meal must be abandoned for the moment for lack of the necessary materials To facilitate the rapid expansion of the school-meal service the Government had as from Oct 1 last increased the grant to local authorities by 10%, with the proviso that the grant should not exceed 95% nor fall below 70% of the total expenditure The supply of certain rationed foods for school-children had been authorised in rural areas where it would be difficult to organise a cooked meal service, and an improved scale of allowances for children in those areas had been announced

The aim of the Government was to prevent malnutrition instead of trying to remedy it after unmistakable symptoms had appeared Where school meals were provided they should be available for all school-children, whether the parents could afford to pay or not Under the 1908 Act authorities may only provide meals if it is shown that a child "by reason of lack of food is unable to take full advantage of the education provided" The new bill would give authorities power to feed all children, whether they were necessitous undernourished, or not and payments could be recovered from the parents afterwards where the education authority thought fit The Bill also swept away the present elaborate procedure and made it obligatory on the authority to provide food where a child was found to be undernourished. Meals could be provided both on days when the schools meet and other days The authorities at present may feed necessitous children under five The new bill empowers authorities to continue feeding these children after they reach the age of five until they go to school Deaf blind and defective children who are educated by special provision whether in schools or at home, also came in for the benefit of these arrangements

Lieutenant Commander Clark-Hutchison (Edinburgh West) in his maiden speech congratulated the Government on the clear language in which the bill is written The measure, which was pleasantly free from reservations and restrictions regularised what had long been the irregular practice in the more enlightened parts of Scotland He asked whether children in nursery schools were included in the bill Mr J Maxton pertinently inquired what pressure could be brought to bear on some recalcitrant authorities who were apt to take their responsibilities lightly and count the bother and the cost He hoped the meals would not be so cheap as to be neither agreeable nor nutritional Above all he urged that this should not be looked on as another job for the teachers He realised the educational value of a meal at school but multiplication tables were also necessary and the teachers were primarily there to fill the youngsters' minds and not their stomachs He hoped that special staffs would be engaged to prepare the meals

Major C N Thornton-Kemsley said that though Scotland was rightly proud of the education she offered, her record for health and nutrition was not so good It was a country in which "the piece" was deeply entrenched and communal meals for children would need careful preparation and intelligent cooking Experience in Wales had not been encouraging—only 4% of the elementary school-children had taken advantage of the facilities provided—they must do better in Scotland Mr Kenneth Lindsay emphasised that a bill for social progress depends on its administration Most of the opposition to communal feeding was on the ground that it was breaking up the home But he held the view that until a number of things were taken out of the home—as industry was and put in the factory—no working mother is likely to have a decent life He asked who was to bring to the notice of the education authority the children who need food Mr Johnston interjected the medical officer the teacher, the attendance officer, members of the school board anyone and Mr Lindsay replied that a job that belongs to anyone is very often not done. He suggested that the local authorities should survey the children and that the department should make a covering survey This had been done in twelve counties in England in recent years

Mr J Westwood joint under secretary for Scotland, who replied said that the Secretary of State was going to appoint a nutritional expert to help the local authorities At present only 7% of the school-children were getting a solid meal They aimed at 20% by midsummer, but that would not be the end He gave an assurance that children attending nursery schools were included in the bill He would have liked to see the school medical services more fully developed but that was one of the things that would have to be tackled after the war

QUESTION TIME

Maternal Mortality in Scotland

Mr T E Groves asked the Secretary of State for Scotland in how many areas the Maternity Services (Scotland) Act was now operative, why it was not operative throughout Scotland, and in view of the increase of maternal mortality, what steps were being, and were proposed to be, taken in order to reduce such mortality, what were the causes of such mortality, and what directions had been given to local authorities direct or through medical officers of health to meet the present situation.—Mr. T. JOHNSON replied: The act is in operation in 40 out of 55 local authority areas. In most of the remaining 15 areas the introduction of the scheme has been delayed because agreement with the local medical practitioners has not been obtained. In one of these areas, Glasgow, the corporation have met the position by special arrangements to provide midwife, doctor and specialist services under previously existing powers. The causes of maternal mortality were investigated by an expert committee whose report was published in 1935.[1] The medical officers of the Department of Health for Scotland maintain regular contact with local *maternity services and medical officers of health in an attempt* to ensure that everything possible is done on the lines of the recommendations in that report to safeguard the health and lives of mothers. The arrangements for supplying free and cheap milk to expectant mothers should also make a valuable contribution towards their health and safety. The Scottish committee of the British Medical Association is endeavouring to persuade doctors in several of the remaining dissident areas to accept service.

National Wheatmeal Bread

Sir ERNEST GRAHAM LITTLE asked the Minister of Health whether he would instruct medical officers of health to institute inquiries in their districts as to the quality and composition of bread supplied under the designation of national wheatmeal, and afford such officers facilities for bringing to exposure and prosecution instances of breach of regulations defining the proper constitution of wheatmeal flour, as set out in the Ministry's circular 2407, 1941.—Mr. E. BROWN replied: The composition of national wheatmeal is prescribed by orders made by the Minister of Food, who I understand is inquiring into the question of maintenance of quality.

Sir E. GRAHAM LITTLE: Is the Minister aware that the circular 2407 (1941) issued by his department to medical officers and institutions under its direction conveyed the assurance that national wheatmeal-flour contained the greater part of the germ of the wheat and was consequently of high nutritive value, and, as this assurance was not correct, if he would withdraw the circular and explain the position.—Mr. BROWN: In the circumstances I see no need to withdraw the circular.

Distribution of National Milk

Mr. DAVID ADAMS asked the Parliamentary Secretary to the Ministry of Food whether, as he had decided to distribute the fruit juices and cod liver oil for young children through child welfare centres, he would now make the receipt of national milk for nursing and expectant mothers and children up to five years of age contingent upon the children concerned attending the child welfare centres and thus secure the return to these centres of many thousands of children lost to them due to the general distribution of national milk.—Major G. LLOYD GEORGE replied: I cannot accept a proposal which would inevitably reduce the number of children receiving benefit under the National Milk Scheme.

Plague in Kenya

A single case of plague occurred in Kiambu district in January, 1941. Cases were reported at Nairobi and in South Kavirondo district in February, at Mombasa and in Fort Hall district in June, and in Nyeri in July. No further extension of the infection has been reported. The latest return shows that the total number of cases detected has amounted to 449, of which 114 have been fatal. Most of the cases have been bubonic plague, but cases of pneumonic plague have occurred. A close watch has been kept on the position among rats in Mombasa but no infected rats have been discovered.

(Mr. G. H. HALL replying to Major A. M. LYONS.)

Medical Care

Major G. OWEN asked the Minister of Pensions whether, in view of the fact that a large number of dependants of men serving in H.M. forces were unable to meet the expenses of private medical treatment, he would arrange to provide facilities for them as are provided for panel patients.—Mr. W. PALING replied: I am not aware of any evidence to support the suggestion, having regard to the recent improvement in the scheme of war service grants, which now provides for grants towards the expenses resulting from serious and prolonged illness in the household.

---

[1] Report on Maternal Morbidity and Mortality in Scotland.

Letters to the Editor

POSTURE DURING SLEEP

SIR,—I became interested in the subject which Dr. Schutz raises in his letter of Dec. 20 some 18 years ago when an accident prevented me lying as usual on my right side. I noticed how difficult it was to accommodate myself to lying on my left and wondered why. Observations in general practice are inevitably disconnected, but as the result of those I made I came to the conclusion that a normal healthy person usually lies on the right side, unless circumstances make this uncomfortable. Where there is some subclinical involvement of the heart action he tends to switch over to the left side, and if the heart is involved still further he will come back to the right once again. When the heart improves—for example, after recovery from an infection—he will find himself going back again to the left side and then on to the right once more as recovery becomes complete. I followed this sequence through a number of cases, and though it is impossible to draw definite conclusions I feel sure that a change of habit should make us think of a cardiac cause. Where a person usually lies on his left side I think there is probably some slight cardiac inefficiency, though it may not be clinically detectable and only suggested by, say, a rheumatic family history or an old attack of diphtheria. I believe this sign of posture during sleep may be a valuable index of cardiac efficiency, but I should be glad to hear the experience of those who have studied the matter with such a possibility in view. I know that I persistently sleep on my right side, but occasionally find that before I can settle off I have to lie for an hour or so on my left, and I have always found that this has been after a succession of short nights or some other extra strain. It would be helpful if such a correlation exists, since it would enable a patient to realise when he was doing too much. What the mechanism is I have no idea.

Further down the scale of cardiac decompensation, I might mention a useful sign of heart failure which seems to be ignored in English journals but which impresses itself on the patient and is often misunderstood by the physician—nocturnal polyuria with relative diurnal oliguria. The mechanism in this case is clear. During the day the circulation is taxed to its utmost, but with improved circulation during the night the kidneys begin to secrete more freely and as a result the patient has to get up to pass urine 2 or 3 times. The symptom is thus a very early sign of heart failure. A timely explanation of its meaning to a patient may enable him to regulate his life in such a way as to live within his limits without curtailing his activities too much. It is really a delicate physiological index of cardiovascular overstrain and deserves to be more widely known and utilised.

Winsford, Cheshire. W. N. LEAK.

EMOTION AND DIASTOLIC PRESSURE

SIR,—Is the effect of emotion on the diastolic blood pressure sufficiently recognised? As a member of a medical recruitment board this question has recently been brought to my notice by the dictum of a medical board inspector that emotion influenced the systolic pressure but not the diastolic.

A retired officer, aged 50, was desirous of re-entering the Army, and, knowing that I was a member of a medical board and wishing to save himself a long and possibly fruitless journey, he asked me to give him a preliminary overhaul. This I did in the manner prescribed by the board. He appeared organically sound, and his nervous system and urine were normal. His blood pressure was 100/83 mm. Hg, estimated at the point of sound disappearance as prescribed. To save him a 20 mile cross country journey I took him by car to the next board meeting. He passed grade I in everything except his blood pressure, which according to examiner no. 3 was 180/100. I explained the situation to no. 3 and the chairman. The former gave me the idea he would be no party to manslaughter, and the latter pointed out to the candidate the stresses he would incur and deferred him for a month, provisionally grading him IV. On my return home I asked the candidate to allow me to take his pressure again. The readings were 140/83. It is true I used a mercury sphygmomanometer and the board's instr[illegible] a spring one, but I cannot believe this amount of discrepancy was due to instrumental error.

When I was in private practice patients several times came to me because they had been refused for life assurance and wanted to know why. As I could find nothing wrong, I communicated with the M.O.s concerned and was told in each case that the refusal was due to high blood-pressure. I watched these people for years, during which their pressure remained normal. It seems to me that in all these cases the effect of emotion is very obvious. I wish I knew how (apart from a soothing manner) I could eliminate it. No. 1 examiner's life is full of difficulties. Is every recruit with tachycardia and a slight tremor to be marked "unstable and will require watching"? Even if the board had an expert psychiatrist (which it has not) the expense of referring 50% of candidates would be heavy. The difference between male and female recruits is also interesting—the women, with few exceptions, being very much more at their ease.

Tunbridge Wells H. O. BUTLER

EMERGENCY MEDICAL SERVICE

SIR,—The Chancellor of the Exchequer exhorts us to make an intensive effort to save. May I be permitted to point a way by which large sums can be retrenched without imposing hardship or unfairness?

There are a large number of doctors employed on a part-time basis at a salary of £500 per annum, plus petrol allowance, by the Emergency Medical Service. They have done little or nothing in return for this retaining fee. It is common knowledge that many of these doctors live so far from their hospitals that when a blitz occurs they are unable to reach their units in time to be of any assistance. It is equally well known that the part-time man continues to do his private or specialist work as in times of peace. Finally seeing that many members of this service are young men under the age of 45, surely it is time they were conscripted. All that they are doing at present is to build up a strong hospital and private connexion at the expense of their more patriotic colleagues.

If it be considered at this critical time of acute shortage of medical officers in the Services that these young men are essential to the E.M.S. then surely they should be employed on a whole-time basis and required to live in their respective hospitals; failing this they should be conscripted immediately or as a means of economy they should be deprived of their unearned emolument and/or put upon a rigid sessional basis.

Harley Street, W.1 V. B. GREEN-ARMYTAGE

ANÆSTHETIC FLOWMETERS

SIR,—In disputing the accuracy of your note on Rotameters in the *Lancet* of Dec. 6, 1941 (p. 718) Dr. Magill (Dec. 20, p. 776) claims that he had a flowmeter of the rotameter type made in 1928. In modern usage the word "type" has become suspect (cf., red wine Port type). Did the bobbin of this flowmeter rotate? Because as the name indicates therein lies the very essence of the Rotameter. The tapered tube is, of course, part of innumerable flowmeters, old and new, but it is the free spinning of the bobbin which eliminates errors due to friction against the glass wall which makes the Rotameter so accurate and popular. Rotameters were used in industry before the last war and later were tried out and rejected—possibly because they were then too cumbersome—by the late W. J. McCardie of Birmingham. Early in 1937 Richard Salt, technician of this department, was given a month's leave of absence to investigate the various commercial flowmeters and see whether they could be adapted to anæsthetic practice and his diary records his visits to the various firms. The Rotameter was the most promising device he saw, and at his suggestion it was modified to meet the requirements of practising anæsthetists. Mr. A. Charles King sold the first of these anæsthetic rotameters, and, referring to his catalogue, wrote to me just before the war: "I propose making a foot-note on the rotameter page herewith as follows:

> "The adaptation of the Rotameter to meet modern anæsthetic requirements was suggested by Richard Salt of the Department of Anæsthetics, Oxford."

Nuffield Dept. of Anæsthetics, Oxford R. R. MACINTOSH

JAW CONTROL IN CONVULSION THERAPY

SIR,—The use of a gag to protect the tongue during therapeutic convulsions entails certain risks. If a wooden gag is used the teeth may be broken. Even with a rubber gag the lips may be caught between the gag and the teeth, the jaw may be dislocated, and in spite of the gag the tongue may be injured. It therefore occurred to me to try to control the jaw without using any form of gag. Although during the first part of the tonic stage the depressors of the mandible contract powerfully, at the beginning the contraction is relatively weak, and I found that it was quite easy to prevent it simply by applying firm pressure to the point of the chin with one hand. It is even easier to prevent the jaws from opening during the clonic stage. The object is to keep the teeth of the upper and lower jaw in apposition throughout the fit. The soft parts then have no opportunity to slip between them. The only difficulty arises with very powerful subjects and even these can readily be managed by this technique after a little experience with weaker patients. I have used this method extensively and have found it uniformly satisfactory. Only patients with very defective dentition are unsuitable, especially if one jaw is entirely edentulous. I believe it is superior to the gag method, and I would like to recommend it to others using induced convulsion therapy.

Glasgow Royal Mental Hospital F. P. HALDANE

NOT SO STERILE WATER

SIR,—A family of children evacuated to a farm in Devon during the blitz promptly gave all the local animals appropriate names. A very thin cat became Mrs. Thin. Another not so thin was called Mrs. Notso. Mrs. Notso in due course had seven kittens. You put your finger on the spot in your annotation of Dec. 27 when you remarked "It seems pertinent to ask whether the severe headache which may follow spinal anæsthesia is not sometimes due to meninges infected in this way." Not so sterile water is, like Mrs. Notso, responsible for many catastrophes.

Ciba Laboratories T. F. M. SMART

"A CONTRAST"

SIR,—To question the value of nursing as a career, or of the training given to nurses, on the ground that one institution at which a baby died of suffocation was staffed by an inadequate number of unqualified nurses is scarcely a scientific procedure. From this one instance, Dr. Esther Carling (in your issue of Dec. 13) deduces that it is natural for parents to hold back their daughters from a nursing career, "if they are liable to be confronted with conditions such as the above during their so-called 'training.'"

The institution in question is not a training school for nurses and at the inquest the girl who had been on duty when the baby died said she "had had no training as a nurse." I need not remind Dr. Carling that no girl can qualify as a nurse unless she enters a hospital which is approved as a training school. There are over 700 approved schools to choose from in England alone, not one of which would have gained approval on the conditions to which reference is made. We know that there is still much to be done before all nurses everywhere get a fair deal, but many training schools now offer their nurses excellent conditions, and many of us who have chosen nursing still think it a fine career.

The general public is years behind the times in its ideas of a nurse's life and work, and most aspirants to nursing have to meet the opposition of the older generation. Is it too much to ask that in the interests of justice such an extremely atypical case as the above should not be cited as an argument against taking up nursing as a career?

21, Cavendish Square,
W.1

MURIEL M. EDWARDS,
Secretary, Nursing Recruitment Centre

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export.

what directions had been given to local authorities direct or through medical officers of health to meet the present situation —Mr T **Johnson** replied The act is in operation in 40 out of 55 local authority areas In most of the remaining 15 areas the introduction of the scheme has been delayed because *agreement with the local medical practitioners has not been* obtained In one of these areas, Glasgow, the corporation have met the position by special arrangements to provide midwife, doctor and specialist services under previously existing powers The causes of maternal mortality were investigated by an expert committee whose report was published in 1935 [1] The medical officers of the Department of Health for Scotland maintain regular contact with local maternity services and medical officers of health in an attempt to ensure that everything possible is done on the lines of the recommendations in that report to safeguard the health and lives of mothers The arrangements for supplying free and cheap milk to expectant mothers should also make a valuable contribution towards their health and safety The Scottish committee of the British Medical Association is endeavouring to persuade doctors in several of the remaining dissident areas *to accept service*

National Wheatmeal Bread

Sir **Ernest Graham Little** asked the Minister of Health whether he would instruct medical officers of health to institute inquiries in their districts as to the quality and composition of bread supplied under the designation of national wheatmeal, and afford such officers facilities for bringing to exposure and prosecution instances of breach of regulations defining the proper constitution of wheatmeal flour, as set out in the Ministry's circular 2407, 1941 —Mr E **Brown** replied *The composition of national wheatmeal is* prescribed by orders made by the Minister of Food, who I understand is inquiring into the question of maintenance of quality

Sir E **Graham Little** Is the Minister aware that the circular 2407 (1941) issued by his department to medical officers and institutions under its direction conveyed the assurance that national wheatmeal - flour contained the greater part of the germ of the wheat and was consequently of high nutritive value, and, as this assurance was not correct, if he would withdraw the circular and explain the position —Mr **Brown** *In the circumstances I see no need to* withdraw the circular

Distribution of National Milk

Mr **David Adams** asked the Parliamentary Secretary to the Ministry of Food whether, as he had decided to distribute the fruit juices and cod liver oil for young children through child welfare centres, he would now make the receipt of national milk for nursing and expectant mothers and children up to five years of age contingent upon the children concerned attending the child welfare centres and thus secure the return to these centres of many thousands of children lost to them due to the general distribution of national milk —Major G **Lloyd George** replied I cannot accept a proposal which would inevitably reduce the number of children receiving benefit under the National Milk Scheme

Plague in Kenya

A single case of plague occurred in Kiambu district in January, 1941 Cases were reported at Nairobi and in South Kavirondo district in February, at Mombasa and in Fort Hall district in June, and in Nyeri in July No further extension of the infection has been reported The latest return shows that the total number of cases detected has amounted to 449, of which 114 have been fatal Most of the cases have been bubonic plague, but cases of pneumonic plague have occurred A close watch has been kept on the position among rats in Mombasa but no infected rats have been discovered

(Mr G H **Hall** replying to Major A M **Lyons**)

Medical Care

Major G **Owen** asked the Minister of Pensions whether, in view of the fact that a large number of dependants of men serving in H M forces were unable to meet the expenses of private medical treatment, he would arrange to provide facilities for them as are provided for panel patients —Mr W **Paling** replied I am not aware of any evidence to support the suggestion, having regard to the recent improvement in the scheme of war service grants, which now provides for grants towards the expenses resulting from serious and prolonged illness in the household

Letters to the Editor

POSTURE DURING SLEEP

Sir,—I became interested in the subject which Dr Schutz raises in his letter of Dec 20 some 18 years ago when an accident prevented me lying as usual on my right side I noticed how difficult it was to accommodate myself to lying on my left and wondered why, Observations in general practice are inevitably disconnected, but *as the result of those I made I came to the* conclusion that a normal healthy person usually lies on the right side, unless circumstances make this uncomfortable Where there is some subclinical involvement of the heart action he tends to switch over to the left side, and if the heart is involved still further he will come back to the right once again When the heart improves—for example, after recovery from an infection—he will find himself going back again to the left side and then on to the right once more as recovery becomes complete I followed this sequence through a number of cases, and though it is impossible to draw definite conclusions I feel sure that a change of habit should make us think of a cardiac cause Where a person usually lies on his left side I think there is probably some slight cardiac inefficiency, though it may not be clinically detectable *and only suggested by, say, a rheumatic family* history or an old attack of diphtheria I believe this sign of posture during sleep may be a valuable index of cardiac efficiency, but I should be glad to hear the experience of those who have studied the matter with such a possibility in view I know that I persistently sleep on my right side, but occasionally find that before I can settle off I have to lie for an hour or so on my left, and I have always found that this has been after a succession of short nights or some other extra strain It would be helpful if such a correlation exists, since it would enable a patient to realise when he was doing too much What the mechanism is I have no idea

Further down the scale of cardiac decompensation, I might mention a useful sign of heart failure which seems to be ignored in English journals but which impresses itself on the *patient and is often misunderstood* by the physician—nocturnal polyuria with relative diurnal oliguria The mechanism in this case is clear During the day the circulation is taxed to its utmost, but with improved circulation during the night the kidneys begin to secrete more freely and as a result the patient has to get up to pass urine 2 or 3 times The symptom is thus a very early sign of heart failure A timely explanation of its meaning to a patient may enable him to regulate his life in such a way as to live within his limits without curtailing his activities too much It is really a delicate physiological index *of cardiovascular overstrain* and deserves to be more widely known and utilised

Winsford, Cheshire. W N **Leak**

EMOTION AND DIASTOLIC PRESSURE

Sir,—Is the effect of *emotion on the diastolic* blood pressure sufficiently recognised? As a member of a medical recruitment board this question has recently been brought to my notice by the dictum of a medical board inspector that emotion influenced the systolic pressure but not the diastolic

A retired officer, aged 50, was desirous of re entering the Army, and, knowing that I was a member of a medical board and wishing to save himself a long and possibly fruitless journey, he asked me to give him a preliminary overhaul This I did in the manner prescribed by the board. He appeared organically sound, and his nervous system and urine were normal His blood pressure was 100/83 mm Hg, estimated at the point of sound disappearance as prescribed To save him a 20 mile cross country journey I took him by car to the next board meeting He passed grade I in every thing except his blood pressure, which according to exa*miner no 3* was *180/100* I explained the situation to no 3 and the chairman The former gave me the idea he would be no party to manslaughter, and the latter pointed out to the candidate the stresses he would incur and deferred him for a month, provisionally grading him IV On my return home I asked the candidate to allow me to take his pressure again The readings were 140/83 It is *true I used* a mercury sphygmomanometer and the board's instrument is a spring one, but I cannot believe this amount of discrepancy was due to instrumental error

---

[1] Report on Maternal Morbidity and Mortality in Scotland

When I was in private practice patients several times came to me because they had been refused for life assurance and wanted to know why As I could find nothing wrong, I communicated with the M O s concerned and was told in each case that the refusal was due to high blood-pressure. I watched these people for years, during which their pressure remained normal It seems to me that in all these cases the effect of emotion is very obvious I wish I knew how (apart from a soothing manner) I could eliminate it No 1 examiner's life is full of difficulties Is every recruit with tachycardia and a slight tremor to be marked "unstable and will require watching"? Even if the board had an expert psychiatrist (which it has not) the expense of referring 50% of candidates would be heavy The difference between male and female recruits is also interesting—the women, with few exceptions, being very much more at their ease

Tunbridge Wells H O BUTLER

EMERGENCY MEDICAL SERVICE

SIR,—The Chancellor of the Exchequer exhorts us to make an intensive effort to save May I be permitted to point a way by which large sums can be retrenched without imposing hardship or unfairness?

There are a large number of doctors employed on a part-time basis at a salary of £500 per annum, plus petrol allowance, by the Emergency Medical Service They have done little or nothing in return for this retaining fee. It is common knowledge that many of these doctors live so far from their hospitals that when a blitz occurs they are unable to reach their units in time to be of any assistance It is equally well known that the part-time man continues to do his private or specialist work as in times of peace Finally seeing that many members of this service are young men under the age of 45, surely it is time they were conscripted All that they are doing at present is to build up a strong hospital and private connexion at the expense of their more patriotic colleagues

If it be considered at this critical time of acute shortage of medical officers in the Services that these young men are essential to the E M S then surely they should be employed on a whole-time basis and required to live in their respective hospitals, failing this they should be conscripted immediately or as a means of economy they should be deprived of their unearned emolument and/or put upon a rigid sessional basis

Harley Street, W 1 Y B GREEN-ARMYTAGE

ANÆSTHETIC FLOWMETERS

SIR—In disputing the accuracy of your note on Rotameters in the *Lancet* of Dec 6, 1941 (p 718) Dr. Magill (Dec 20, p 776) claims that he had a flowmeter of the rotameter type made in 1928 In modern usage the word "type" has become suspect (cf, red wine Port type) Did the bobbin of this flowmeter rotate? Because as the name indicates therein lies the very essence of the Rotameter The tapered tube is, of course, part of innumerable flowmeters, old and new, but it is the free spinning of the bobbin which eliminates errors due to friction against the glass wall which makes the Rotameter so accurate and popular Rotameters were used in industry before the last war and later were tried out and rejected—possibly because they were then too cumbersome—by the late W J McCardie of Birmingham Early in 1937 Richard Salt technician of this department, was given a month's leave of absence to investigate the various commercial flowmeters and see whether they could be adapted to anæsthetic practice and his diary records his visits to the various firms The Rotameter was the most promising device he saw, and at his suggestion it was modified to meet the requirements of practising anæsthetists Mr A Charles King sold the first of these anæsthetic rotameters, and referring to his catalogue, wrote to me just before the war "I propose making a foot-note on the rotameter page herewith as follows.

> "The adaptation of the Rotameter to meet modern anæsthetic requirements was suggested by Richard Salt of the Department of Anæsthetics, Oxford"

Nuffield Dept. of Anæsthetics, Oxford R R MACINTOSH

JAW CONTROL IN CONVULSION THERAPY

SIR,—The use of a gag to protect the tongue during therapeutic convulsions entails certain risks. If a wooden gag is used the teeth may be broken Even with a rubber gag the lips may be caught between the gag and the teeth, the jaw may be dislocated, and in spite of the gag the tongue may be injured It therefore occurred to me to try to control the jaw without using any form of gag Although during the first part of the tonic stage the depressors of the mandible contract powerfully, at the beginning the contraction is relatively weak, and I found that it was quite easy to prevent it simply by applying firm pressure to the point of the chin with one hand It is even easier to prevent the jaws from opening during the clonic stage The object is to keep the teeth of the upper and lower jaw in apposition throughout the fit The soft parts then have no opportunity to slip between them The only difficulty arises with very powerful subjects and even these can readily be managed by this technique after a little experience with weaker patients I have used this method extensively and have found it uniformly satisfactory Only patients with very defective dentition are unsuitable, especially if one jaw is entirely edentulous I believe it is superior to the gag method, and I would like to recommend it to others using induced convulsion therapy

Glasgow Royal Mental Hospital F P HALDANE

NOT SO STERILE WATER

SIR,—A family of children evacuated to a farm in Devon during the blitz promptly gave all the local animals appropriate names A very thin cat became Mrs Thin Another not so thin was called Mrs Notso Mrs Notso in due course had seven kittens You put your finger on the spot in your annotation of Dec 27 when you remarked "It seems pertinent to ask whether the severe headache which may follow spinal anæsthesia *is not sometimes due to meninges infected in this way*" Not so sterile water is, like Mrs Notso, responsible for many catastrophes

Ciba Laboratories T F M SMART

"A CONTRAST"

SIR—To question the value of nursing as a career, or of the training given to nurses, on the ground that one institution at which a baby died of suffocation was staffed by an inadequate number of unqualified nurses is scarcely a scientific procedure From this one instance, Dr Esther Carling (in your issue of Dec 13) deduces that it is natural for parents to hold back their daughters from a nursing career, "if they are liable to be confronted with conditions such as the above during their so-called 'training'"

The institution in question is not a training school for nurses and at the inquest the girl who had been on duty when the baby died said she "had had no training as a nurse" I need not remind Dr Carling that no girl can qualify as a nurse unless she enters a hospital which is approved as a training school There are over 700 approved schools to choose from in England alone, not one of which would have gained approval on the conditions to which reference is made. We know that there is still much to be done before all nurses everywhere get a fair deal, but many training schools now offer their nurses excellent conditions, and many of us who have chosen nursing still think it a fine career

The general public is years behind the times in its ideas of a nurse's life and work, and most aspirants to nursing have to meet the opposition of the older generation Is it too much to ask that in the interests of justice such an extremely atypical case as the above should not be cited as an argument against taking up nursing as a career?

21, Cavendish Square, MURIEL M EDWARDS,
W 1 Secretary, Nursing Recruitment Centre

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export

Obituary

PERCY FLEMMING

M D LOND F R C S

Percy Flemming was one of those modest and retiring people whose lifework is done so unostentatiously that its merits are liable to be underestimated or wholly ignored My intimate association with him commenced in 1899 when we were both clinical assistants to Sir John Tweedy at Moorfields Shortly afterwards he was appointed ophthalmic surgeon to University College Hospital and I became his clinical assistant there and at Moorfields Still later I became his colleague at both hospitals, and after our retirement from hospital work we served together on a committee for the prevention of blindness It is not too much to say that I owe more to his help and encouragement in ophthalmology than to anyone else In this respect I am by no means alone, for one of Flemming's joys in life was helping lame dogs over stiles He was a born teacher and his patience and perseverance in imparting his profound knowledge, whether of anatomy, ophthalmology (both medical and surgical), or archæology (especially of London) were illimitable In all these subjects he was a master In ophthalmology he was a first-class clinician and a good operator He was no narrow specialist, for his proficiency in anatomy and medicine stimulated his special interest in the ocular signs of general disease, such as thrombosis of the cavernous sinus with valuable results It is much to be regretted that his contributions to ophthalmic literature were comparatively few, for only his colleagues and students are fully aware of the extent and scientific accuracy of his clinical work He was deeply interested in the social and preventive aspects of ophthalmology, and the admirable report of the Departmental Committee on the Partially Blind was largely due to his untiring energy and level-headed judgment It is not surprising that he was specially devoted to his alma mater, University College, for he was an alumnus of University College School, a fellow of the college, and the last professor of ophthalmology in it before its absorption in the University of London, as well as ophthalmic surgeon to University College Hospital While most ophthalmic surgeons who have had the honour of being members of the staff of Moorfields have become attached to it with love and veneration, there can be no doubt that Flemming, though not wanting in the same sentiments, remained specially devoted to his first love, and no-one was more loyal to the great traditions of University College Hospital than he

J H P.

Flemming was born in London in 1863, the eighth child in a family of nine, there was no medical tradition and circumstances demanded that he should get qualified as soon as possible From University College School he went on to the college at the age of sixteen, taking the M R C S from U C H in 1885 After qualifying he returned to the college as a demonstrator of anatomy in order to earn enough to take up a house-physiciancy for which at that time a charge of one pound a week was made for board Then for some years he demonstrated for Thane, and coached for qualifying examinations It was in this way that he met his wife who was a student at the Royal Free Hospital He even took women students into the anatomy museum at University College and was reprimanded A vacancy occurring at U C H as junior ophthalmic surgeon (to Tweedy) he missed election at first intention but a year later, when the successful candidate resigned, he took his place and laid the foundation of a consulting practice which later became very large His election to Moorfields soon followed Flemming's contributions to medical literature or proceedings were small He found writing difficult and was shy of talking in public, but in talking to small gatherings or to students he found enormous pleasure Retiring from the active staff of U C H at the age of 60, when his private practice was still large, he soon felt he was not performing enough operations to keep his hand in and decided to retire from professional work In 1928 he selected a date and on the appointed day moved from Harley Street to St John's Wood A complete Londoner, he did not consider spending his retirement outside London His hobby was history, architectural and ecclesiastic, and he found enjoyment in identifying and classifying prints in the London Museum He also served on two committees of the Board of Education Only in the spring of 1939 did he begin to feel that his wife and he were getting rather old for London, and they moved to Pangbourne, where Mrs Flemming predeceased him by a year

JAMES HUGO GRAY

M D ADELAIDE

British anatomy has suffered a severe loss in the death, at Epsom, on Dec 20, of Prof J H Gray, of St. Mary's Hospital medical school It was only in April last that he succeeded Prof J E S Frazer in the chair of anatomy at the age of 32 He was born in South Australia, the eldest son of James T Gray, of Orroroo, Dalhousie As an undergraduate in Adelaide he was a pupil of the late Prof H H Woollard, and quite early in his career he determined to follow his chief and become an anatomist He became student tutor in anatomy at St Mark's University residential college, but he was not yet qualified when Woollard left Having finished his medical course in 1932 with a resident post at Adelaide Hospital he was for a short time a demonstrator of anatomy under Prof H J Wilkinson before coming to this country to work with Woollard at St Bartholomew's Hospital, where he held a research fellowship under the auspices of the British Empire Cancer Campaign When his chief went on to University College, London, Gray accompanied him as senior demonstrator, working on the lymphatic system, a field which he was rapidly making his own

Thelma Duryea Adelaide

After Woollard's death in January, 1939, he buried himself in research and teaching with the evacuated medical sciences faculty at Cardiff, and later at Leatherhead, where he succeeded in inspiring students with his own enthusiasm During his undergraduate days he had accompanied four expeditions into Central Australia to study the aborigines both on physical and cultural lines, the anthropological side of anatomy ranking only second to his interest in the lymphatics and their relation to the spread of cancer in the body Altogether h published some twenty considerable papers and reports He leaves a widow and three young children

---

Major **Martin McAuley Morrow**, R A M C, died in Palestine on Sept 8 from the effects of a motor accident He was twenty-nine years of age, and went to school at the Methodist College in Belfast He graduated in medicine from Queen's University, Belfast, in 1936, and after holding resident appointments at the Royal Victoria Hospital, and at Londonderry Mental Hospital, he joined the R A M C in September, 1937, and proceeded to Palestine in 1938 As an undergraduate, Morrow was a sound rugby forward and was cruiser-weight champion of Queen's in 1934, the same sterling qualities were showing in h professional work He married Miss Joan Ashton in 194

Rhymney Cottage Hospital—*This hospital, which* owned and administered by the workmen of Rhymney, w damaged by a cloud burst which occurred in the district Oct 5 The Nuffield Provincial Hospitals Trust have ma a grant of £200 to the hospital which will make good the wh of the damage

Public Health

From the Annual Reports

BRIGHTON

Dr Rutherford Cramb in his report for 1940 says "In spite of war conditions, the general standard of health in the borough was remarkably good" The birth-rate was 12 48 the death-rate 13 9 and infantile mortality 69 In 1915 the birth-rate was 16 87, death-rate 16 2 and infantile mortality 97 In 1938 the infantile mortality was 61, it has never been low in Brighton Of the 134 infant deaths in 1940, 59 occurred in the first month and 75 later, pneumonias and bronchitis accounted for 32 of them and diarrhœa for 18 Among infectious diseases, measles gave 2675 notifications with 3 deaths and whooping-cough 391 notifications with 4 deaths From Dr Cramb's school report we learn that of 2954 children treated for skin conditions, 210 had scabies, 625 impetigo and 1021 septic sores The diagnosis between impetigo and septic sores is to some extent a distinction without a difference, but the greater frequency in children than in adults of local coccal infections of the skin without general reaction calls for inquiry

LEICESTER

Dr E K Macdonald's 1940 report is the 92nd of the series The estimated population of Leicester in the mid-year was 259,400, an increase of 20,231 on the 1931 census figure The birth-rate was 13 89 and the death-rate 14 47 crude and 14 75 corrected Infantile mortality was 51 2, cancer mortality 1 77, and tuberculosis mortality 0 9 The report is of an unfavourable year with a severe winter quarter Measles gave 5878 notifications with 10 deaths, scarlet fever 1315 notifications with no deaths, whooping-cough 306 notifications with 2 deaths, cerebrospinal fever 135 notifications with 10 deaths, and diphtheria 840 notifications with 50 deaths The last is serious In the report of the isolation hospital we are told that more cases of diphtheria were admitted than in any previous year, the disease "remained of the severe malignant type" mostly caused by the gravis strains Three cases of diphtheritic respiratory paralysis were treated in a Both respirator, 2 recovered, 1 died Last year 3355 children were immunised against diphtheria This is satisfactory, for the number is not far short of the 3604 births in the year But Leicester was tardy in adopting inoculation, so that only 13,088 children have been immunised altogether Bronchitis, which had killed 69 persons in 1938 and 91 in 1939, scored 437 deaths in 1940, and pneumonia with 595 notifications and 207 deaths compared unfavourably with 400 notifications and 138 deaths in the previous year

Suicides declined from 61 in 1939 to 45 in 1940 There were 343 new cases of pulmonary tuberculosis and 101 of non-pulmonary, the former was the highest number since 1936, the latter the highest since 1928 when 117 cases were notified With the exception of that year and of 1921, when 105 cases were notified, 1940 had the largest number of new cases of non-pulmonary tuberculosis in any year since notification started in 1918 This rise has been fairly general throughout the country The main increase is in tuberculous meningitis, to which 19 out of the 34 deaths accredited to non-pulmonary tuberculosis were due A satisfactory feature is a drop in new cases of phthisis in persons aged 15–24 years, yet it is curious that of cases detected in the ages 15–19 the males are about half and the females twice as numerous as in 1939 From the report of the city general hospital we learn that in the past nine years admissions have increased 250%, confinements 600%, operations 900%, X-ray work 550%, and pathological work 1000%

Infectious Disease in England and Wales

WEEK ENDED DEC 13

Notifications —The following cases of infectious disease were notified during the week smallpox, 0, scarlet fever, 1392, whooping-cough, 1715, diphtheria, 1203, paratyphoid, 17, typhoid, 16, measles (excluding rubella), 886, pneumonia (primary or influenzal), 966, puerperal pyrexia 168, cerebrospinal fever, 126, poliomyelitis, 18, encephalitis lethargica, 1, dysentery, 105, ophthalmia neonatorum, 76, No case of cholera, plague or typhus fever was notified during the week

The number of civilian and service sick in the Infectious Hospitals of the London County Council on Dec 10 was 1385, including scarlet fever 163, diphtheria, 320, measles, 38, whooping cough, 478 enteritis, 48 chicken pox, 38 erysipelas, 31, mumps, 17 poliomyelitis, 4, dysentery, 8, cerebrospinal fever, 18, puerperal sepsis, 17, enteric fevers 17, malaria, 1, other diseases (non-infectious), 107, not yet diagnosed, 80

Deaths —In 126 great towns there were no deaths from measles, 2 (0) from enteric fevers, 2 (0) from scarlet fever, 11 (1) from whooping-cough, 29 (2) from diphtheria, *37 (2) from diarrhœa and enteritis under 2 years, and* 21 (2) from influenza The figures in parentheses are those for London itself

Leeds and Bristol each reported 1 death from an enteric fever There were 7 fatal cases of diphtheria at Liverpool

The number of stillbirths notified during the week was *205* (corresponding to a rate of 40 per thousand total births), including 23 in London

---

Medical News

University of Oxford

In a congregation on Dec 13 the degree of M D was conferred in absentia on H de B Kempthorne and E C O Jewesbury

University of Cambridge

At recent examinations the following were successful —

FINAL EXAMINATION FOR M B, B CHIR

Part II —Physic, Pathology and Pharmacology J D Atwell A P Bentall H Butler D Caddy, W H Chase, J W A Crabtree R A D Crawford, E D Cullen, A Davies, J P Donnell, H L Ellis, E J S Evans, T N Fison, G C Franklin, D S G Genge, N Gillman E V Hope, A E Howarth, D H King F M Lancaster J J Landon, S E Large, A G Leishman D McAnally C W F McKean, H L McMullen, S L Melville J N Milnes P H Nash, J H C Phillips, R J F H Pinsent, G F Purves, A H Rea, E Rhodes W S Rhodes, R D-Rhys Lewis, P Sainsbury, F E T Scott W H Scott Easton, J A Smith G O Storey, J H Tasker, W H Tattersall, D G Vulliamy, M M Walker and D G Wraith

University of Leeds

At recent examinations the following were successful —

M D —R G Smithson

FINAL EXAMINATION FOR M B, CH B

Part I (Old Regulations) —Dorothy J Armitage, T E Bairstow J W Bishop, E K Blackburn, Mary Braithwaite, J G Brockis, J S Cason, L Crawford, C B Dawson, Joan A Dawson, L S P Divers F F Edmonds, Mary Eglington, H Gray Joan Hall, Elspeth Harrison, E B Harrison Kathleen M Harrison G Hipps, J D M Holt Mary Johnson J A Judson, H M Kershaw, H S Klein, T G Kletz C E Lacey, R E Lawrence, G K Laxton Margaret N Lea, M A Lecutier, H Lee, R Levy, C L Lewis G L Middleton, L L Miller, D T Milnthorpe E K Morris E Neil, J B Raper, H Riley Betty Sanderson, S Smith, P M Smith Moorhouse R M Stamp H Stead W S Suffern J W Taylor, A Wertheimer, G M Williamson, and Pauline Wynne

University of Liverpool

At recent examinations the following were successful —

M D —R R Hughes

FINAL EXAMINATION FOR M B CH B

Part I —J Ainsworth A M Brenner, N Broughton, P S Dearden E G Donovan, P M Edis, K B N Freeman, J Gould, F E D Griffiths Betty Hargreaves B T Harrison, H Holden, C A Hopkins J G P Jones, J D King, J W Langley Constance G Lee, A McPherson, W E S Marshall J W Maybury, J K Meiring, Janet B Mercer, Sheila L Richardson, J J Rivlin, J M G Sarson W Sircus A Stone A H Swithinbank, Nora Taggart C Taylor, D W Townley, Simone J van Son, J G Warbrick, Margaret A Williams, R D B Williams, and F B Wright

Part II —Muriel O Andrews, D Annis, A Ansell, E R Banner Beryl R Bentley Margaret J Blackburn, R A Blyth H O M Bryant E Burman, W G Canning, Eva V Cooper K H Dalrymple A S Davidson H Davidson, G Davies, J N Dearnaley, J F Doherty K E Donnellan Ann Donnelly J F Ferguson, I H Foy H Francis H G Frank, H Friend, S M Green, F D Griffiths Elizabeth M Harper, E N Hugh Jones A Jolleys Eirwen M Jones S E Keidan D A Kininmonth, H Lewis, I P Madhok, Margaret L Magee A W Merrick, Jean C Miller, A F Murphy, R C Nairn, K H Oldfield N E Raybould J S Redfern R L B Roberts M J R Ryan Betty Schofield H R Shepherd, Nora Taggart G H Thomas K B Thomas Doreen M Watt, Hugh O Williams, and Margaret Woolfenden

Scottish Nursing Committee

Mr T M Taylor, LL B, professor of law at Aberdeen University, has been appointed chairman of the committee set up to deal with the salaries of Scottish nurses He succeeds Lord Craigmyle who has resigned on account of ill health

Notes Comments and Abstracts

LIVING BACKWARDS

> "He's in prison now being punished and the trial doesn't even begin till next Wednesday and of course the crime comes last of all"
>
> "Suppose he never commits the crime?" said Alice
>
> "That would be all the better, wouldn't it?" the Queen said

Child guidance workers if they do not endorse the White Queen's views on punishment, share her belief that it would be better if the crime was never committed, they agree in fact that it is better to get the treatment in first Dr Harry Edelston, speaking on child guidance to Leeds magistrates, pointed out that the offence for which a delinquent is brought into court is seldom the first There is generally a history of trifling offences culminating in the one which has led to the charge Thus a child may have begun thieving by sneaking a penny or two from his mother with little attempt at concealment, and have gone on to cover thefts of shillings by denial and deceit, he very likely passed to similar adventures outside the home and finally to gang activities with a group of companions Adolescents can be difficult to help especially when they have been in court, and the aim of the child guidance centre, he said must be to get hold of delinquents before they commit their offences, for then there is a good chance of curing them Children whom nothing seems to touch are rare, and these may become hardened by wrong treatment so that they become the recidivists and tramps of the next generation Even if a child is untreatable his state can be diagnosed more quickly and with less mishandling at the child guidance clinic than by the process of trial and error which existing social machinery imposes

For the most part, however, children respond to simple adjustment of their home and school difficulties Punishment must be reserved for occasions which demand it, and it must be recognised as a temporary failure in the normal affectionate relations between parent and child, for, though sometimes necessary to protect others, it is not conducive to the highest type of moral behaviour In the child guidance clinic it is possible to achieve the sympathetic atmosphere in which the confidence of the child and the parent can be gained This is not always easy for both parties usually arrive in a defensive state It is natural for children to lie when there is a threat of punishment hanging over them and as Dr Edelston pointed out evasion and deceit are not the prerogative of children only Closely interwoven with many of the behaviour problems encountered are the social evils of poverty, overcrowding and lack of outlet for young emotions, lack of recreation When it comes to allocating blame he is cautious often the environment is mostly to blame by making demands on the child with which he cannot cope He instanced the case of a girl of twelve, a petty thief and a truant from school, she had won a scholarship to the high school, but being only moderately intelligent the keen competition overwhelmed her Moreover, her parents were poor and she could not afford a part in the normal social activities of the school, she was conscious of her threadbare clothes Between punishment at home and unhappiness at school she had no heart for work, and it took a long time to help her to adjust herself Closely interwoven with many of the behaviour problems encountered are these social evils of poverty, overcrowding, lack of scope for emotional outlet and for recreation Often the psychiatric social worker at the clinic can do much by introducing the child to a more suitable kind of work, to a club or some other social group

MORE VICTORIAN GIANTS

THE second volume of "British Scientists of the Nineteenth Century" (Pelican Books, 6*d*), by J G Crowther, comprises short biographies of three more of the outstanding scientific figures of that time William Thomson, afterwards Lord Kelvin, who possessed immense intellectual strength but lacked intellectual taste, seeming at times to be impervious to the ideas of others and who (according to the author) allowed himself to be diverted from pure to applied science at the dictate of capitalism James Clerk Maxwell, the greatest theoretical physicist of the nineteenth century who, by his mastery of contemporary modes of thought, did so much to direct the path of future research William Henry Perkin, the father of the aniline dye industry which was afterwards developed on the grand scale and with such portentous consequences in Germany Despite some highly technical discursions, which might have been simplified or omitted in a popular work, the intelligent and uninformed reader will not find himself bored by this book

---

MANCHESTER'S NEW M O H —Dr C M Brown has been appointed medical officer of health for Manchester in succession to Dr R Veitch Clark who retires in July

Dr Brown who is 39 years of age graduated M B from Glasgow University in 1921 He took his D P H two years after and in 1930 he was awarded his M D with commendation for a thesis on artificial pneumothorax in the treatment of pulmonary tuberculosis He was called to the bar at Gray's Inn in 1934 Dr Brown has had wide experience of the public health service, for he acted as deputy M O H for Ely county council, as M O H for Whittlesey urban district council, and as senior assistant M O H and T O for Hull, before taking up his present post as M O H and school M O for Middlesbrough and port M O for the River Tees

ROYAL SOCIETY OF MEDICINE —On Wednesday, Jan. 7, at 2 30 P M, Dr J F Halls Dally will deliver his presidential address to the section of history of medicine of this society He will speak on the evolution of modern medicine

Appointments

AITKEN, ROBERT, M D EDIN, L R C P I medical referee for cases of dermatitis, &c, in Haddington, Linlithgow, Midlothian and Peebles

ARNING, DOROTHY, M A OXFD, M B MANC temp asst M O for Surrey

BLEADEN, F A, M R C S, D P M temp senior asst M O for Erdington House, Birmingham

DANGERFIELD, DAVID, M R C S asst M O at G W R Medical Fund Society's Hospital at Swindon

JEFFRIES, MARY, M B DURH temp asst M O for Surrey

ROULSTON, EMIL, M B BELF resident anæsthetist at the Royal Sussex Hospital, Brighton

SMITH, ROGER, M B LPOOL R S O at the Royal Sussex Hospital Brighton

WALLACE, NORAH, M R C S temp asst M O for Surrey

WRIGHT H J M B DUBL senior asst M O at St Richard's Hospital, Chichester

Victoria Central Hospital, Wallasey —The following appointments have been made —

HAMILTON JOHN, F R C S asst gynæcological surgeon,
PHILLIPS T J, M R C S asst ophthalmic surgeon and
BROWN, HERBERT, L D S dental surgeon

Births, Marriages and Deaths

BIRTHS

CRESSWELL —On Dec 16, the wife of Major Pearson Cresswell, R A M C —a daughter

EVANS —On Dec 21, at Stourbridge, the wife of Mr Philip Jameson Evans, F R C S —a daughter

HOFFMANN —On Dec 25, in Oxford, the wife of Dr Wilfrid Hoffmann—a son

MOYNAGH —On Dec 23, at Exeter, the wife of Captain Kenneth Moynagh, R A M C —a daughter

PREWER —On Dec 23, at Maidstone, the wife of Surgeon Lieutenant R Russell Prewer, R N V R —a daughter

SAVAGE —On Dec 26 at Maidstone the wife of Major Oswald Savage R A M C —a son

TRACEY —On Dec 24, at Exeter, the wife of Dr John Tracey—a daughter

MARRIAGES

BRYAN—SINCLAIR —On Dec 27 in London Charles Walter Gordon Bryan, F R C S lieut colonel R A M C, of Harley Street, to Molly Kestell Sinclair

DEATHS

CLEGG —On Dec 21 John Gray Clegg M D Lond, F R C S, late surgeon to the Manchester Royal Eye Hospital

DAVIS —On Dec 22 1941, at Oxford, Charles Noel Davis, M D Lond, D P H, D T M & H late of Shanghai

DRYLAND —On Dec 28, Leslie Winter Dryland D P H K St J, of Kettering Northamptonshire, aged 73

FULLER —On Dec 24 in Bath Alfred Leonard Fuller F R C S I, M R C S aged 71

JONES —On Dec 26, at Hendon, Isaiah Henry Jones M R C S, aged 81

KINGDON —On Dec 21 at Lock's Heath Southampton James Renorden Kingdon M R C S

LONGLEY —On Dec 28 Joseph Alan Longley, M B Leeds, F R C S E, of Greta Cottage Saltburn

ORIGINAL ARTICLES

NEUROSIS SIMULATING ORGANIC DISORDER

G T COOK
M D CAMB
PHYSICIAN TO AN E M S BASE HOSPITAL

WILLIAM SARGANT,
M B CAMB , M R C P , D P M
DEPUTY CLINICAL DIRECTOR OF AN E M S NEUROLOGICAL UNIT

FOR years the trend of teaching in medicine has been to diagnose neurosis by the exclusion of organic disease rather than by the presence of positive signs of neurotic illness This negative approach to diagnosis may save a few cases from being mislabelled neurotic, with the possible postponement of necessary physical treatment, but the converse is much more often true In very many neurotic patients the real nature of the illness is overlooked , attention is focused on the somatic aspect, to the patient's detriment , and months or even years may be spent in fruitless attempts to secure benefit by a mistaken form of treatment

This paper analyses the findings in fifty Service patients admitted for investigation to an E M S base hospital from neighbouring Army units and found by us to be suffering from neurotic illness All of them had been admitted with organic labels or symptoms, and no mention was made of neurosis by the unit medical officers in their referral notes If neurosis had been suspected originally, the patients could have been sent direct from their units to the command psychiatrist for disposal and much time and expense saved thereby The procedure we adopted was to make specific inquiry for positive evidence of neurosis as soon as preliminary physical examination had revealed nothing sufficient to account for their symptoms but physical investigations were fully carried out where indicated—e g , all cases of abdominal pain received barium meal X ray and many had a test-meal and gastroscopy, all cases of physical injury other than head injury were seen by the orthopædic specialist and so on

Diagnostically doubtful cases have been excluded from this series, as has been any patient in whom the possibility of neurosis was mentioned by the unit medical officer in his referral notes Otherwise it represents a consecutive series of positive cases seen over a period of twelve weeks Of the fifty patients, thirty-four had been admitted to medical wards and comprised 20% of all general medical admissions to the hospital during that period Before this system was instituted, many of these patients would simply have been returned to their units marked " nil organic found," since the initial diagnoses indicated that they were not obviously neurotic , what their subsequent history would have been is suggested by the facts given below The system has been in operation for nearly a year in this hospital, and such a consecutive series was finally collected and analysed because of the interesting facts that were being revealed—facts that have been hard to come by in the past because psychiatrists rarely gain admission to medical and surgical wards in a consulting diagnostic capacity , *their rôle* is usually to dispose of or treat the patient when the diagnosis has already been made, as was previously the practice in this particular hospital

CASES ANALYSED

The fifty cases analysed were all Service patients, ranging in age from 19 to 50 , twenty-nine of them were under 30 years of age Twenty-six of the patients were conscripts and there were twelve volunteers, the rest being made up of territorials and reservists, with only one regular soldier in the group Only nine of them had undergone any severe military stress, such as the retreat from Dunkirk or very heavy bombing The table gives the frequency and type of organic symptoms present on admission, contrasted with the final psychiatric diagnoses As a rule the psychiatric symptoms were mixed and placing them in any group was a matter of picking out the predominant findings—for instance, many of the mental defectives also had anxiety and hypochondriacal features Besides the neurotic signs and symptoms presenting themselves in every patient forty-two out of the fifty patients had a positive family history of neurotic predisposition or severer mental disorder in one or more first-degree relatives, thirty-nine had significant early neurotic traits in childhood, forty had evidence of various degrees of psychological abnormalities in their previous personality, ten had had previous nervous breakdowns in civil life or had been attending at a hospital for nerves over a period of several months A high proportion of the patients had a low intelligence or actual mental defect Twenty-four patients failed to reach Standard 7 on leaving school, of which fifteen finished in Standard 5 or lower In our experience, mental defectives are outstanding for the persistent and confusing organic symptomatology that they produce under stress

Organic symptoms on admission	Cases	Final psychiatric diagnosis	Cases
Muscular pains } Weakness }	12	Obsessional states	1
		Anxiety states	20
Head symptoms	9	Hysteria	5
Chest symptoms	12	Anxiety hysteria	3
Abdominal symptoms	15	Post traumatic states	2
Genito urinary symptoms	2	Mental defectives	9
		Depression	9
		Psychopathic personality	1

One reason for the discrepancy between the patient s organic complaints and the real psychiatric condition behind them is the neurotic's fear of reporting his nervous symptoms, especially when under military discipline This fact emerged in our investigations However, symptoms clearly neurotic in nature were usually easy to obtain if inquired about in a positive way and in most patients enough could be elicited in half an hour to make the diagnosis certain, once an adequate physical examination and essential tests had been completed That these positive neurotic findings had not been previously elicited is probably due solely to the fact that medical students are rarely taught how to inquire for them

PREVIOUS INVESTIGATION AND TREATMENT

We have tried to find out what had happened to this group of patients before they first reached a psychiatrist We have every reason to think that our figures underestimate rather than exaggerate the true state of affairs Sixteen patients had not previously reported sick These were therefore caught early and dealt with promptly Of the remaining thirty-four patients twenty-five had been in hospital for the same symptoms once or several times previously Eight of these patients had between them been in hospital 26 times spending 96 weeks in hospital and 106 weeks on light duty out of 410 total weeks of service—i e , about 50% of their service Eight more patients spent 21 weeks out of 468 weeks of service in hospital and between them reported sick on over 340 occasions during the remaining 447 weeks Nineteen patients had between them been X rayed 30 times, including 12 barium meals two barium enemas and two intravenous pyelographies Seven patients had received physiotherapy, totalling 35 weeks inpatient and 56 weeks outpatient treatment

DISPOSAL

Twenty-three patients were boarded out of the Army immediately, on psychiatric grounds Two patients were returned without regrading to their units, with a letter of advice to the unit medical officer about their treatment and disposal Eight patients were sent to an E M S neurological centre for treatment or special transfer to other branches of the Service where they could be used—*e g* , Pay Corps or units more approximating to their work in civil life Seventeen patients were regraded C before being returned to their units with the suggestion that though they were neurotic they might manage certain types of work in the unit if this could be provided , otherwise they could be referred to the command psychiatrist for disposal Practically all were regraded C before return to their unit, because the cost and trouble involved in letting such patients be sent abroad to break down and then have to be sent back again is obvious For we found that despite the positive neurotic findings given above and the frequent history of illness since entering the Army, no less than thirty patients out of the fifty were still graded A1 on admission to hospital, thirteen patients were in various categories of B, and only four had been graded C

CONCLUSION

We believe that a case has been made out for the more frequent employment of diagnostic neuropsychiatric opinion early in the investigation of medical and surgical conditions of any obscurity Such a procedure widely adopted, would result in a great saving of hospital expenditure, medical man-power, and specialist investigation The cost and time spent on this small group of patients alone both in hospitals and in their units, must have been very large There is reason to think that a similar situation exists in other parts of the country

We wish to thank Dr Louis Minski for stimulating this cooperation between an E M S neurological unit and an E M S base hospital, and Dr E E Anderson, medical superintendent of the base hospital, for allowing this investigation to be undertaken and for providing the necessary facilities

ASSESSMENT OF FOOT FUNCTION

ANATOMICAL AND CLINICAL CONSIDERATIONS

H A HARRIS M A CAMB, M D LOND, D SC WALES
PROFESSOR OF ANATOMY IN THE UNIVERSITY OF CAMBRIDGE

THE number of cases of men boarded out or transferred to a lower medical category calls for a revision of the prevailing methods of assessing a man's footwork This is done too often in terms of four degrees of flat-foot, or of certain anomalies such as hallux valgus, hallux rigidus or hammer toes

A careful history of the foot condition is essential with special reference to pain infection, and previous modifications of footwear The first thing is to examine the gait, then the boot and sock and thirdly the accessory paraphernalia in the way of loose metal supports inside, or fixed patches on the sole or heel outside The next thing is to realise that any previous treatment of boot or foot may have been useless or harmful

The pregnant woman or the waiter carrying a tray leans backward and finds movement downhill difficult The pedlar and the soldier with a pack on his back leans forward and movement uphill is difficult To walk uphill with a pack free dorsiflexion at the ankle is necessary The movement can be assessed by knee-bending with heel and toe on the ground The kneecap should be well in advance of the great toe and the angle between the tibia and the horizontal foot about 60°–65° If the range of this movement is limited the soldier with a pack cannot walk uphill erect, but has to bend forward (fig 1) Limitation of this movement of dorsiflexion at the ankle may be acquired as a result of injury to the anterior margin of the tibia where it comes in proximity to the neck of the talus A row of small osteophytes may be seen at this site in the ankle as a result of vigorous knee-bending exercises, vigorous pushing in the scrum, or fencing The limitation of movement may be due also to the presence of a well-marked transverse ridge on the neck of the talus which prevents the tibia moving forwards on the talus to the usual extent (fig 2) This anterior talo-tibial region on the lateral radiogram, and the limitation of dorsiflexion at the ankle-joint must be examined in detail before the condition is attributed to shortening of the tendo Achillis and an operation for lengthening the tendon is suggested The limitation of movement was mechanical in the case illustrated and therefore all forcible manipulation would have been not only useless but also harmful

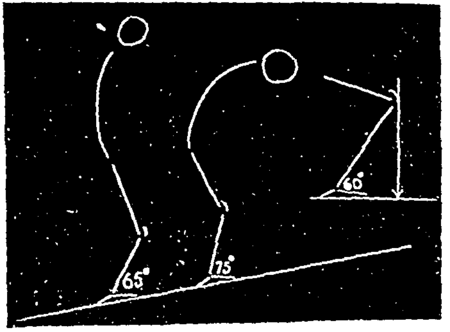


FIG 1—Result on posture of limitation of dorsiflexion at the ankle joint especially when walking uphill Inset shows how this movement may be assessed with a plumb line or vertical rod

FLAT-FOOT

The foot may be divided in two ways The first is to divide it transversely at the midtarsal joint—between the talus and scaphoid medially and the os calcis and cuboid laterally—into posterior and anterior pillars These two transverse joints are essentially the site of most of the movement of inversion and eversion, and of Chopart's amputation The posterior pillar is short, strong, simple and designed for the attachment of the powerful tendo Achillis The anterior pillar is twice as long, delicate, complex, consisting of many bones, many joints, and permitting those gliding movements between the bones which give spring to the forepart of the foot The other way is to divide the foot into the medial longitudinal arch and the lateral longitudinal arch The lateral arch consists of the os calcis, cuboid and metatarsals 4 and 5 , the medial arch of the os calcis, talus, scaphoid, cuneiforms 1, 2 and 3, with the corresponding metatarsals The lateral arch is strong, simple and is designed for the main support of the weight of the body in standing The medial arch is delicate, complex consists of many bones, joints and critical ligaments, designed for elasticity rather than supporting the weight of the body, and giving the tendons, muscles, nerves and vessels entry into the sole

The transverse arch is best marked in the line of the tarsometatarsus, and is strengthened by strong interosseous and plantar ligaments to prevent undue splaying or spreading of the metatarsal bones when the weight is thrown forward on to the toes The critical point in the medial longitudinal arch is the spring ligament running from the sustentaculum tali to the scaphoid The critical point in the transverse arch is the 3rd cuneiform (and its attached metatarsal) which articulates with six neighbouring bones whereas the other bones of the tarsus articulate with four, except the os calcis which articulates with only two Both critical points are associated with elasticity and movement rather than with weight-supporting only The three enemies of elasticity in the tissues and movements of the body are age, infection and malnutrition As older men are called to the forces so these factors assume greater significance Notwithstanding the numerous articular surfaces of the 3rd cuneiform, it and its associated metatarsal are the least movable bones in the foot It is interesting to compare the degree of mobility of the long bones of the hand and foot, for in the hand the mobility is in the decreasing order 1 (thumb), 5, 4, 3, 2 , in the foot, 5, 4, 1, 2, 3

Apart from æsthetics flat-foot, involving either longitudinal or transverse arches need not be painful and need involve no disability The pain and disability are often severe during the period of establishment of the condition, but may disappear after it is established, especially if infection is not one of the factors involved The outstanding exception is the flat-foot associated with gonorrhœa, leucorrhœa or pyorrhœa I do not intend to discuss flat-foot per se, but rather to dissociate it as far as possible from the first disability of limited dorsiflexion at the ankle, and the other disabilities to be considered

EVERSION AND INVERSION

The foot of the baby is normally inverted and gradually moves in the first two years of life from the inverted ape-like position to the more everted position Eversion of the foot, with the sole turned outwards, is one of the late movements to be acquired in the child—much later than the specialised movements of the upper limb, such as supination of the hand and opposition of the thumb Eversion is necessary to allow walking along the breast of a hill or on the camber of a road Tall men in particular are easily fatigued if made to march for miles on the edge of the road with one foot everted and the other inverted The movement takes place mainly at the mid-tarsal (Chopart's) joint The muscles producing inversion are essentially the tibialis anticus, tibialis posticus, the long flexors of the toes, and the large muscles of the calf attached to the tendo Achillis.

Eversion is produced essentially by the peronæal muscles, a specialised offset of the extensor group,

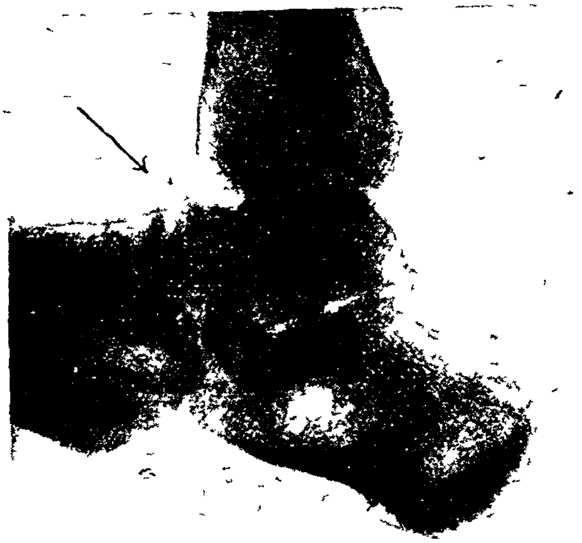


FIG 2—Radiogram of the dorsiflexed foot in a man of 29, treated for flat foot The essential disability is limitation of dorsiflexion at the ankle joint by a bony ridge on the neck of the talus with tenosynovitis of the tibialis anterior and pain over the lower part of the shin

peronæus longus brevis, and to a lesser degree peronæus tertius and the long extensor of the toes The peronæal muscles are among the last muscles to function in the baby, their nerve-supply, the superficial peronæal or musculocutaneous branch of the lateral popliteal nerve, is one of those nerves which, like the ulnar, lives dangerously It runs far from its neuronal centre of control in the anterior horn cells of the lumbosacral spinal cord its course around the neck of the fibula exposes it to repeated injuries, its nutritional arteriæ comitantes are picked up rather haphazardly,* and it ends in a peculiarly exposed cutaneous nerve stretching from the mid-point of the lateral aspect of the leg to the dorsum of the foot and toes When the foot is inverted this nerve stands out like a tendon and is visible through the skin in all subjects except the obese It is the exposed position of this nerve, easily bruised by an ill-fitting shoe, easily stretched by forcible inversion of the foot, peculiarly susceptible to damp and cold by reason of its lengthy subcutaneous course, which is responsible for the numerous cases of spasm of the peronæal muscles such as Robert Jones often described In men of 35 and over it is very unlikely that the range of movements of inversion and eversion can be improved by forcible wrenching with such instruments as the Thomas wrench Moreover, since with advancing age the cross-section of the metatarsals becomes definitely narrower from side to side in proportion to depth, the danger of fracture increases

In standing it is an advantage to have the feet widely separated at the heel and the two feet directed at an angle of 60° away from each other In walking it is a disadvantage to maintain the feet at this angulation, for an unnecessary strain is thereby put on the peronæal muscles, when these contract a large hollow depression extends along the lateral aspect of the leg In marching with the toes turned outwards this hollow is visible, in marching with the toes forward the hollow is barely seen

TENDON SHEATHS

The development of the tendon sheaths in the hand is determined by the mobility of the metacarpals, so that the mobile thumb and little finger have sheaths continued to the wrist whereas the other fingers have sheaths ending near the metacarpophalangeal joints For some reason but scanty attention is paid to the tendon sheaths in the foot and ankle, with the result that the significance of localisation of pain in the foot is missed The tendons in the long flexor sheaths of the fingers are nourished by very small vessels in the mesenteries of the tendons, the vincula longa and brevia In the foot the long tendons have similar synovial sheaths and similar mesotendons or vincula, but in the case of the tibialis posticus and peronæus brevis there are no mesotendons to guarantee nutrition of a high standard Thus in any excessive and unaccustomed strain a tenosynovitis of the tibialis posticus and peronæus brevis easily arises The former throws a load on the spring ligament and the other invertors, the latter on the peronæus longus and other evertors of the foot Both these give areas of well-circumscribed pain Similarly after forcible and unaccustomed dorsiflexion of the ankle-joint there is often a tenosynovitis of the sheath of the tibialis anticus with pain radiating up the front of the tibia (painful lower shin) This pain was well-marked in the case described (fig 2)

Yet another site of deep-seated pain is the tendon sheath of the flexor longus hallucis which is crossed beneath by the tendon sheath of the flexor longus digitorum at a point virtually below and between the 2nd and 3rd cuneiform bones This pain is also localised in the length of the two tendons deeply in the sole The tensile strength of the long tendons of the foot, if regarded as proportional to the cross-section of the tendons or the work done by the muscles concerned, yields an interesting result The load on the flexor longus hallucis is greater than that on all the other toes together, so that the great toe in man is in a sense overworked

INFECTION AND USAGE

Examination of the patient and his radiogram is particularly needed when there is a history of pain and infection, especially gonorrhœal The rôle of infection is often missed, but in such cases a good radiogram will frequently show calcification in the plantar ligaments, deposits in the synovial sheaths and calcification in supernumerary sesamoids Like the fibrocartilages of the vertebræ, knee, wrist and temporomandibular joint, many structures in the foot are apt to be involved in an infective process the plantar fascia and the long plantar ligament, often in conjunction with a bony spur of the tuberosity of the os calcis, the thick spring ligament from the sustentaculum tali to the tuberosity of the scaphoid, the groove for the tibialis posticus tendon immediately behind the medial malleolus, lined by glistening fibrocartilage almost hyaline in character, and the similar articular groove on the posterior tubercle of the talus for the tendon of the long flexor of the great toe Their rate of change of tissue fluid is slow They are slow in becoming involved in any systemic infection, but once involved they rarely clear up The foot remains painful Manipulation and exercise are ineffective

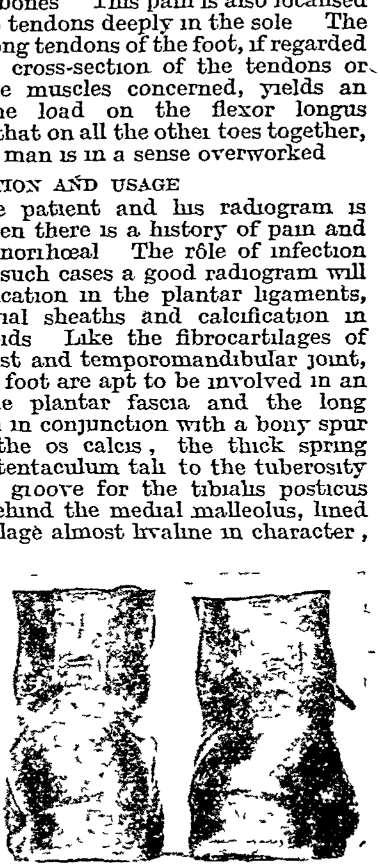


FIG 3—Posterior view of the boots of the same patient to show that the routine treatment of raising the inner side of the heel and sole has displaced the weight of the body away from the mid line Pain and disability unrelieved and even intensified

Alterations to boots should be carefully examined They are often faulty and the routine use of the lengthened heel, crooked heel and metatarsal bar is responsible for much increased disability (fig 3) Certain peculiar operations, such as working the kick starter on a motor cycle and a stiff clutch on a heavy lorry, produce the characteristic injuries at the ankle-joint already described, for which rest is unfortunately the best available treatment Small subcutaneous bursæ at pressure points are worth investigating in terms of the boot

CONCLUSIONS

More care should be taken over footwear, and boots should be made to fit the feet, the feet should not be made to fit the regulation pattern boots—cobbling on live tissues is rarely successful

Dorsiflexion at the ankle is important in maintaining the upright posture when walking uphill, it becomes more critical as the gradient and the load increase

Eversion of the one foot, with inversion of the other, is essential for walking along the camber of the road or the breast of a hill and is fatiguing The foot in walking should be directed forwards rather than outwards The typical Army stance throws an unnecessary load on the peronæal muscles

Tendon sheaths are as important functionally in the foot as in the hand, their extent and bony relationships should be known

Infection—particularly gonorrhœa leucorrhœa and pyorrhœa—often involves the plantar fascia spring ligament and tendon sheaths especially where the sheaths are in relation to fibrocartilaginous areas on the bones

Past history and previous special usage of the foot should be carefully analysed The appearance of the foot is not a reliable guide, function alone counts In the older recruits manipulation of the foot and violent exercises may be harmful

NATURAL HISTORY OF BRIGHT'S DISEASE *

CLINICAL HISTOLOGICAL AND EXPERIMENTAL OBSERVATIONS

ARTHUR ELLIS, O B E M D TORONTO F R C P
DIRECTOR OF THE MEDICAL UNIT AT THE LONDON HOSPITAL,
PROFESSOR OF MEDICINE IN THE UNIVERSITY OF LONDON

II —ESSENTIAL HYPERTENSION

THE problem of hypertension and its relation to disorders of the kidney has interested physicians since the time of Bright Recently new light has been thrown on this age-long problem first by the recognition of the condition now commonly called malignant hypertension, and secondly by the production of experimental renal hypertension in animals The knowledge derived from these sources has clarified our conception of the whole group of diseases coming under the general heading of Bright's disease and I propose now to set out the evidence of the relationship of high blood-pressure to disease of the kidney and to outline the conception of Bright's disease which this new knowledge suggests

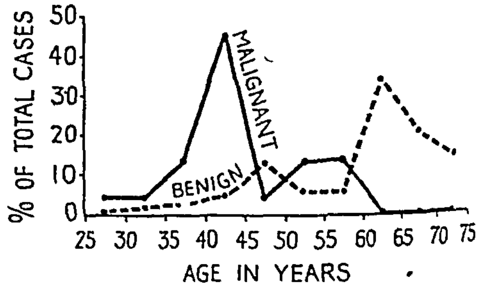
When the occurrence of arterial hypertension was first appreciated its dependence on pre-existing renal disease was assumed The remarkable observations of Mahomed (1874) † cast the first doubt on the correctness of this view They were followed by the clinical recognition by Allbutt (1895) in this country and Huchard (1899) in France of hypertension without obvious renal disease There thus arose the conception of a primary arterial hypertension independent of renal disease, to be distinguished from the secondary hypertension seen in patients with chronic nephritis To this primary arterial hypertension Allbutt gave the name hyperpiesia, a term which became firmly established in English terminology In most other countries the condition was known as essential hypertension

The separation of essential hypertension from chronic nephritis with hypertension marked a great advance in our knowledge of high blood-pressure and its relation to kidney disease As time went on, however, a difficulty arose One group of patients with hypertension failed to fit satisfactorily into the new classification—those in whom the clinical course of the disorder suggests a primary hypertension, but in whom signs of renal impairment develop and death in renal failure often occurs Janeway was perhaps the first clinician to recognise this group of severe cases of primary hypertension terminating in renal failure, but it is to Volhard and Fahr in Germany and to Keith, Wagener and Kernohan, and to Fishberg in America that we owe the general recognition of the condition now generally termed malignant hypertension In a lecture based on 40 fatal cases of malignant hypertension with necropsy (Ellis 1938) I pointed out that in those patients dying early in the disease both the natural history of the disorder and the histological findings indicate that in the early stages the renal lesions are minimal, and that the earliest histological changes are necrosis and endarteritis of the arterioles not only in the kidneys but in other organs Fahr (1919) had already recognised these arterial lesions and considered them the cause of the glomerular changes He attributed them to the action of various toxins—syphilis, lead, rheumatism and other unknown agents Volhard considered that both the arteriolar and glomerular lesions were due to vascular spasm Our observations at the London Hospital led us to believe that the glomerular lesions were the result of the arteriolar degenerations and that the latter were a direct result of the hypertension For this view we have subsequently obtained convincing support from the production by Wilson and Byrom (1939) of exactly similar renal lesions in animals in which hypertension had been experimentally induced

The recognition of malignant hypertension with its axiomatic acceptance of the view that hypertension can produce lesions in the kidney similar to those seen in chronic nephritis is revolutionary, it is crucial to an understanding of the true nature of chronic Bright's disease Its significance will be apparent when we come to discuss the effects of hypertension on the kidney in experimental animals Thus essential hypertension is now considered to occur in two forms malignant hypertension with a relatively rapid course to death in renal failure and benign hypertension without obvious renal involvement—the hyperpiesia of Allbutt

MALIGNANT HYPERTENSION

Our series contains 103 cases 76 of which are known to have died autopsy was performed on 50 of these 7 cases are still under observation and 20 no longer attend the clinic The age when first seen, in cases where the diagnosis was verified histologically ranged from 17 to 72 The great majority of the cases (67%) fall between 35 and 55 years of age—that is, they are considerably younger than the age when hypertensive symptoms usually become manifest This is the common experience Fahr (1925) noted that while 76% of his cases of benign hypertension were over 60 only 7 5% of those with malignant hypertension were above this age This difference in the age-incidence of benign and malignant hypertension is well shown in the figure, modified from Kimmelstiel and Wilson (1936) Occasional cases in children have been reported and I have seen the kidneys from a child of 10 in which the appearance was characteristic In our series there were 69 males and 34 females



Age incidence in benign and malignant hypertension Modified from Kimmelstiel and Wilson (1936)

The *clinical picture* in malignant hypertension is one of rapidly progressing cardiac and renal failure in a previously healthy adult The common age of onset is between 40 and 50 years The patient gives no history of preceding renal disease The usual methods of onset are attacks of headache and vomiting on waking in the morning, or attacks of præcordial pain and breathlessness, or paroxysmal nocturnal dyspnœa, or suddenly failing vision On examination, the heart and peripheral arteries will be found to be enlarged, often to a considerable degree, the blood-pressure will be high, especially the diastolic pressure which is usually 130 mm Hg or more, the fundus oculi will show hypertensive retinitis with papillœdema and often hæmorrhages and exudate In early cases these may be the only abnormal findings, but usually by the time the condition is recognised other signs have developed Some degree of heart-failure is nearly always present, it occurs in the form of left ventricular failure, giving rise to breathlessness on exertion and paroxysmal nocturnal dyspnœa there may be moist sounds in the lungs, but peripheral venous congestion and œdema are only rarely seen in the early stages, so that unless heart-failure is suspected the significance of these findings may be overlooked The urine will probably contain a considerable amount of albumin, and blood may be present. In contrast to cases of nephritis the urinary deposit usually contains only a few red cells, excess of leucocytes and granular casts being a rare finding. The urinary specific gravity tends to be fixed and renal-function tests will show some nitrogen retention with moderate or severe impairment of concentrating power. In advanced cases there may be great wasting and anæmia, but often these signs are absent. Death with combined renal and cardiac failure will occur six months to two years from the date of the first symptoms.

---

* The second Croonian lecture for 1941, not delivered owing to the war

† References will be found at the end of lecture 3

At autopsy the kidneys will show slight or only moderate contraction. On histological examination, in addition to the lesions of ischæmic atrophy usually present in those who have had high blood-pressure, focal glomerular lesions are found in the form of acute focal necroses often leading to adhesions between capsule and tuft, fibrinoid necrosis of individual capillary loops increased cellularity, often focal, affecting a single lobule of a glomerular tuft and varying degrees of capsular proliferation with occasional true crescent formation. The tubules show a severe albuminous degeneration and hyaline droplet degeneration is almost always present in occasional tubules. The interstitial tissue shows varying degrees of fibrosis and cellular infiltration. The vascular lesions are important and are constantly present. There is necrosis of the walls of many arterioles, particularly the afferent arterioles to glomeruli. These are enormously swollen owing to the deposition or imbibition of material which is dark purple in sections stained with hæmatoxylin and eosin—the so-called fibrinoid necrosis. This swelling of the wall may lead to apparently complete obliteration of the lumen. There are in addition loss and fragmentation of nuclei, and frequently red cells in the vessel walls. Proliferative changes in and about the vessels also occur. The smaller arteries, particularly the interlobulars, show an almost constant lesion in the form of so-called endarteritis fibrosa; this is a relatively richly cellular thickening of the intima often leading to gross narrowing of the lumen and easily distinguished from the intimal thickening with increase of elastic tissue found in all cases of hypertension. These vascular lesions are not confined to the kidney. They occur in other organs, particularly the adrenals pancreas and intestine more occasionally in liver stomach, prostate testicle (Ellis 1938).

NATURAL HISTORY

It is apparent, then, that the end stage of this condition and of chronic type 1 nephritis are very similar. Indeed, if the patient is not seen till late in the disease it may be difficult to settle the diagnosis between these conditions. The histological changes described above were formerly considered characteristic of nephritis and these patients were then regarded as typical examples of chronic interstitial nephritis. If we turn to the early stages of the condition the situation is different; for though hypertension is severe and papillœdema present, clinical and histological evidence of renal involvement may then be slight or almost absent. For example, the concentrating power of the kidney may be well preserved, the blood-urea within normal limits, and other tests of renal function satisfactory. Albumin may even be absent from the urine, and in cases dying early from non-renal causes histological lesions in the kidney scanty. If special attention is paid to examination of the fundus oculi in all patients with hypertension many more cases of malignant hypertension are seen in the early stages. Several such cases were reported in my previous paper and since then our experience has been extended. Out of the present series of 103 cases of malignant hypertension albumin was absent from the urine in 10 when first seen. In 26 cases there was only slight albuminuria and the renal-function tests were normal. We have examined the kidneys in 12 cases which died in this early stage from a non-renal cause such as cerebral or subarachnoid hæmorrhage cardiac infarction or failure. None of these kidneys showed extensive damage the renal parenchyma was well preserved and in some the lesions were so scanty that only careful search revealed them. The earliest lesions appeared to be arteriolar necroses. Even when lesions were minimal in the kidneys, acute arteriolar lesions were found in other organs.

In spite of this scanty renal damage in the early stage the course is rapidly progressive the patient usually dying from a combination of renal and cardiac failure. Heart-failure plays a prominent part in this rapidly progressive course, and even though death occurs in uræmia nitrogen retention is usually less well marked and of shorter duration than in other forms of renal disease. This is in accord with the absence of severe renal contraction in malignant hypertension and the histological finding of many well-preserved and apparently healthy glomeruli.

Malignant hypertension, therefore, may be viewed as a primary essential hypertension associated with widespread acute vascular lesions leading to rapidly developing renal and cardiac failure.

Complications.—Hypertensive encephalopathy with convulsions and often with severe mental disturbance, severe bouts of headache and vomiting due to increased intracranial pressure, cerebral or subarachnoid hæmorrhage, and cardiac infarction and failure may arise at any stage of the disease.

PROGNOSIS, DIAGNOSIS AND ÆTIOLOGY

The prognosis is extremely grave. Death usually occurs within a year of the appearance of papillœdema; often it is even more rapid and we have seen only one patient who has survived for more than two years after the diagnosis was established. Recovery in our experience does not occur, but we have several patients under observation in whom the papillœdema has disappeared after long rest in bed with accompanying symptomatic improvement. In one of these the papillœdema disappeared after lumbar sympathectomy.

The diagnosis of malignant hypertension should in my opinion, never be made in the absence of papillœdema; this sign distinguishes malignant hypertension from benign hypertension. The cause of the papillœdema is increased intracranial pressure but the mechanism by which the increase is produced is far from clear. Fishberg (1939) believes it to be due to cerebral œdema caused by failure of the cerebral arterioles to contract adequately this producing an increased pressure in the brain capillaries with resulting increased transudation. It must be emphasised that papillœdema and the other signs of hypertensive retinitis are also seen in other types of chronic Bright's disease with hypertension—for example type 1 and type 2 nephritis and chronic pyelonephritis—but in these conditions renal failure is always far advanced before the papillœdema appears. If a patient with malignant hypertension is not seen until late in the disease, when renal failure has developed, differential diagnosis from chronic type 1 nephritis may be difficult or impossible and occasionally this differentiation cannot even be made histologically. In some cases of malignant hypertension with severe cerebral symptoms and little or no evidence of renal involvement the differential diagnosis from brain tumour may be very difficult. We have occasionally seen cases where painless hæmaturia has been the only symptom and such patients have been thought to be suffering from surgical disease of the kidney. Examination of the optic fundus is sufficient to establish the diagnosis.

Fahr suggested that the vascular lesions in malignant hypertension are the result of a toxin, while Volhard holds that they are due to vascular spasm caused by a circulating pressor substance. Fishberg, on the other hand, considers malignant hypertension merely a severe essential hypertension occurring in a young person—a giving way of the arterioles under a high diastolic pressure. Our experimental results show that there is support for Fishberg's views in the fact that in the rat a well-marked and rapidly developing hypertension gives rise to lesions similar to those seen in malignant hypertension in man.

I have already pointed out that malignant hypertension develops before the age at which essential hypertension usually appears; and in our experience it is unusual to get a long history of preceding hypertension or of hypertensive symptoms in patients with malignant hypertension. This suggests that we are not dealing with an end-result in a long-standing preceding hypertension. Such cases do however occur; occasionally a patient is seen who is known to have had hypertension for many years, and who then develops papillœdema and signs of renal involvement with a rapidly downhill course to death in cardiac and renal failure These patients tend to be older than the ordinary case of malignant hypertension, and the condition appears to be the imposition of a " malignant termination " on a previously benign hypertension They seem to be quite different from most patients with malignant hypertension in whom the disease runs a more rapid course

Malignant hypertension may also be associated in some patients with Cushing's syndrome (pituitary basophilism), in which the presence of other symptoms makes it possible to follow the development of the hypertension from its early stages—an opportunity otherwise rare It is in these cases therefore, that we can best follow the rapid course of the disease I shall deal later with the effects of renal ischæmia and the theory of a vicious circle in Bright's disease which has resulted from the animal experiments of Wilson and Byrom It would seem that such mechanisms are intimately concerned in the ætiology of malignant hypertension I must therefore postpone further discussion of this question until I come to these experimental observations

BENIGN HYPERTENSION

The clinical features of benign hypertension—the hyperpiesia of Allbutt—are familiar, and I therefore propose to confine my further remarks on essential hypertension to three aspects the prognosis in benign hypertension, the question whether malignant hypertension is the only form of severe renal lesion occurring in essential hypertension, and the pathogenesis of essential hypertension

Prognosis —One important result of the recognition of malignant hypertension is its effect on our attitude to prognosis in benign hypertension I am firmly of the opinion that the usual outlook on this disorder is much too gloomy, largely because our outlook is dominated by the dramatic downward course in malignant hypertension When the cases are considered separately we appreciate that benign hypertension runs a comparatively favourable course While it is true that many of these patients develop cardiac failure or suffer a cerebral catastrophe it is also true that many live for years with well-marked arterial hypertension without complaining of symptoms, they may even live to old age and die of unrelated afflictions without ever being seriously affected by the arterial hypertension The importance of these considerations is obvious when it is realised that nearly all patients with hypertension belong in the benign group—more than 90% according to Fishberg I should place the figure even higher, for though we have been particularly interested in malignant hypertension we have seen, during the past five years, only 56 examples Far too severe restrictions are imposed on patients with benign hypertension There is little evidence that such restrictions have any permanent effect on the course of the disease, but they severely limit the happiness and usefulness of the patient and at times give rise to an anxiety state more disabling than the disease itself The regimen prescribed for the patient with benign hypertension should depend not on the degree of hypertension but on the presence or absence of evidence of cardiac enfeeblement Two further precepts concerning prognosis in benign hypertension are generally recognised, first, that women will withstand prolonged high blood-pressure for much longer periods than men, secondly, that the older the patient is at the time when hypertension becomes manifest the more favourable is the prognosis

OTHER FORMS OF RENAL LESIONS IN ESSENTIAL HYPERTENSION

Fishberg (1939) considers that in older subjects there are occasional cases in which renal arteriosclerosis resulting from prolonged high blood-pressure leads to such extensive renal atrophy that renal failure results These kidneys show purely atrophic lesions, and no " reactive changes in the glomeruli " We have seen kidneys which appeared to belong to this group, but in our experience they were very rare—perhaps because the number of old people in our material was small We have, however, seen a few patients, mostly women, who had what appeared to be essential hypertension but in whom renal failure developed; and histologically the kidneys showed a " chronic interstitial nephritis " These cases differed from malignant hypertension in that they ran a chronic course and papillœdema was never seen Histologically the acute lesions of malignant hypertension were lacking, the renal changes corresponding with those described by Wilson and Byrom (1941) in rats with chronic hypertension We therefore suspect that, in addition to the relatively acute course of malignant hypertension, a chronic form of renal disease can arise as a result of essential hypertension It does not, however, seem to be very common

PATHOGENESIS OF ESSENTIAL HYPERTENSION

The experiments of Goldblatt and his colleagues (1934), who constricted the renal arteries of dogs, have shown that diminished blood-flow through the kidneys gives rise to sustained hypertension These important observations have provided a likely explanation for the occurrence of hypertension in kidney disease There is a tendency at present to infer from this that all hypertension—including essential hypertension—is due to primary renal ischæmia The cause of renal ischæmia in essential hypertension is claimed by those who hold this view to be renal arteriosclerosis This argument has one obvious weakness, if we accept it we must suppose, as Fishberg has pointed out, that the renal arteriosclerosis is both the cause and the result of the hypertension There is the following convincing evidence that renal arteriosclerosis is produced by hypertension (1) that, broadly speaking, the longer standing the hypertension the greater the degree of renal arteriosclerosis (Turnbull 1915), (2) that in malignant hypertension the arteriolar lesions in the kidney are minimal in the early stages and severe in the later stages, (3) that if hypertension is produced in a rat by clamping one renal artery, arteriolar lesions will appear in the unclamped kidney owing to the hypertension, but will be absent in the clamped kidney which is protected from the hypertension by the clamp on its renal artery If the presence of arteriosclerosis in the kidneys of patients with essential hypertension is to be expected as the result of the hypertension it cannot be convincingly advanced as the cause The problem still remains open and the evidence that essential hypertension is due to primary renal vascular lesions is at present insufficient It is quite possible of course that the mechanism of production of essential hypertension is renal ischæmia, but if this is so it seems more probable that the renal ischæmia is at first functional, being due to some extra renal factor, and is only later aggravated by renal arteriosclerosis

MODE OF ACTION OF SULPHONAMIDES IN VITRO

Sydney D Rubbo
PH D, DIP BACT LOND, B SC SYDNEY
SENIOR LECTURER, BACTERIOLOGY DEPARTMENT, UNIVERSITY OF MELBOURNE

J M Gillespie
M SC MELB
ASSISTANT IN THE DEPARTMENT

It is now generally accepted that the inhibitory effect of sulphanilamide on bacterial growth is due to " interference " with the function of the *p*-aminobenzoic acid and structurally similar groupings of the bacterial cell (Woods 1940) Hence, Fildes (1940) in enunciating his hypothesis on " a rational approach to chemotherapy," suggested that *p*-aminobenzoic acid behaved as an essential metabolite for bacterial growth—that is, a substance or chemical group which plays an essential part in a chain of synthesis necessary to convert non living nutrients into living bacterial protoplasm Thus, *p*-aminobenzoic acid is now regarded as an essential metabolite—but only on the indirect evidence of its capacity to counteract the bacteriostatic action of sulphanilamide * Before the conception of bacterial inhibition by " interference " can be widely accepted it still remains to be proved that the metabolite (*p*-aminobenzoic acid in the present discussion) is essential for the growth of an organism susceptible to sulphanilamide The main difficulty in demonstrating the essential rôle of *p*-aminobenzoic acid is that the organism which requires the acid as an essential metabolite is capable of synthesising it from the nutrients supplied in the medium However, this difficulty has been entirely removed by the observation of Rubbo and Gillespie (1940) that *p*-aminobenzoic acid is something more than an essential metabolite—namely a bacterial growth factor which must be present in the medium before growth of certain organisms can take place

---

* The authors have not seen a proof of this article Since it was written other evidence has become available (see Blanchard K C *J biol Chem* 1941, 140, 919)

In a study of the bacteriology of the organism responsible for the industrial production of butyl alcohol and acetone by fermentation it was found that the organism, *Clostridium acetobutylicum* (W) required traces of *p*-aminobenzoic acid in a medium of known chemical constitution for growth to occur (Rubbo and Gillespie 1940, Rubbo et al 1941) This was the first recorded observation of *p*-aminobenzoic acid acting as a bacterial growth factor Since then it has been claimed (Ansbacher 1941) that the acid is probably one of the factors of the vitamin-B complex acting as a chromotrichia factor for the rat and a growth-promoting factor for the chick

The present report deals with the inhibitory effect of four well-known sulphonamide drugs—sulphanilamide, sulphapyridine, 'Soluseptasine' and 'Proseptasine' (M&B) on the growth of *Cl acetobutylicum* (W) and the reversal of this inhibition by increasing amounts of growth factor, *p*-aminobenzoic acid The results fully confirm Woods's findings with hæmolytic streptococci and extend his observations to a wider range of sulphonamides In view of this it would be more correct to speak of the anti-sulphonamide, rather than the anti-sulphanilamide action of *p*-aminobenzoic acid

Experimental

Two strains of *Cl acetobutylicum* (W) were used, one (No 862) being obtained from the American Type Cultures Collection while the other was isolated in this department As both behaved similarly in all experiments they will not be distinguished further The preparation of the basal synthetic medium containing *p*-aminobenzoic acid has already been described (Rubbo et al 1941), and also the technique of inoculation anaerobic incubation and so on The sulphonamides were dissolved in water to give a concentration of 3×10^{-2} molar and were sterilised by filtration through a Seitz asbestos E K filter, 1 ml of this solution was added to 10 ml of synthetic medium thus giving a final sulphonamide concentration of 3.3×10^{-3} M Each experiment was performed in duplicate with both strains of the organism and the type of growth noted after 48 hours' incubation at 37° C The results are shown in table I

TABLE I

Experiment	Concentration of sulphonamide $\frac{M}{3300}$	Amount of *p* aminobenzoic acid per ml of basal medium (µg)						
		0.00001	0.0001	0.001	0.01	0.1	1	10
1	Control without drug	−	+	+	+	+	+	−
2 A	Sulphanilamide	−	−	−	+	+	+	−
B	Sulphanilamide	−	−	−	+	+	+	−
3	Sulphapyridine	−	−	−	+	+	+	−
4	Soluseptasine	−	−	+	+	+	+	−
5	'Proseptasine	−	−	+	+	+	+	−

Growth + no growth −
Expt 2 A, inoculum of vegetative cells, B inoculum of sporing forms

Experiment 1 table I illustrates the growth-factor capacity of *p*-aminobenzoic acid which, in a concentration of 0.0001 µg per ml was sufficient to permit growth of the bacterium On the other hand, higher concentration of the growth factor for instance 10 µg per ml, inhibited rather than stimulated growth This is considered consistent with the common biological phenomenon that a substance may stimulate growth of cells in high dilution but may be toxic in stronger concentrations Such a finding suggested the possibility that sulphanilamide might stimulate growth on extreme dilution but experiment showed that it was inactive from this point of view (Rubbo and Gillespie 1940) In experiments 2, 3 4 and 5 it will be seen that while the sulphonamide drugs used were bacteriostatic in the presence of minimal concentrations of growth factor, this bacteriostasis was removed on increasing the concentration of the factor ten- to a hundred-fold Sulphanilamide and sulphapyridine appeared to be more toxic towards the bacterium since quantitatively more *p*-aminobenzoic acid was required to reverse their inhibitory effect than was required for soluseptasine or proseptasine Spores of this bacterium were found to be just as susceptible to sulphanilamide as were the vegetative cells (experiments 2A and 2B)

The results recorded in table II describe a "titration" experiment in which varying amounts of *p*-aminobenzoic acid were added to tubes of basal medium containing different concentrations of sulphanilamide The object of this experiment was to determine quantitatively the amount of growth factor necessary to remove the inhibitory action of the drug

TABLE II

Concentration of sulphanilamide		Amount of *p* aminobenzoic acid per ml of basal medium (µg)					Ratio of sulphanilamide *p*-aminobenzoic acid by weight
Molar	µg per ml	0.0005	0.001	0.002	0.003	0.004	
$\frac{M}{6600}$	26	−	+	+	+	+	26 000
$\frac{M}{3300}$	52	−	−	+	+	+	26 000
$\frac{M}{1650}$	104	−	−	−	−	+	26,000

Growth +, no growth −

The findings reveal a remarkable disproportion weight for weight between the amount of *p*-aminobenzoic acid and that of sulphanilamide inactivated As will be seen 0.001 µg of *p*-aminobenzoic acid antagonises 26 µg of sulphanilamide—i e, 1 part by weight antagonises 26,000 parts of drug Similarly if the concentration of inhibitor is increased twofold or fourfold a proportionate increase of growth factor is necessary to permit growth of the organism The importance of this quantitative relationship will be discussed later[†]

DISCUSSION

The following facts have been established —

1 *p* aminobenzoic acid is a bacterial growth factor for an anaerobic bacillus, *Cl acetobutylicum* (W)

2 The growth of this organism in vitro is inhibited in the presence of sulphonamide drugs

3 The bacteriostatic action of the sulphonamides is removed by increasing the concentration of growth factor ten- to a hundred-fold above the amount necessary to promote growth

4 One part by weight of *p*-aminobenzoic acid reverses the bacteriostasis caused by 26,000 parts by weight of sulphanilamide

The broad aspects of these findings are mainly concerned with providing experimental evidence for Fildes's hypothesis of a rational approach to chemotherapy. Of the three classes of bacterial inhibition postulated by Fildes (1940) that which involves a competition by the inhibitor for an enzyme associated with the essential metabolite is well illustrated here

Cl acetobutylicum (W) is an organism rather more peculiar in its nutritional demands than most bacteria, in that it is unable to grow in laboratory media unless supplied with *p*-aminobenzoic acid and a fermentable sugar Therefore, *p*-aminobenzoic acid must be regarded as a growth factor for the bacterium rather than an essential metabolite The cultivation of the organism in a medium of known chemical constitution made it possible to study the mode of action of sulphanilamide under conditions uncomplicated by unknown factors, such as constitution of the medium and nutritional requirements of the organism

In regard to the relation of chemical structure to the "rational approach" hypothesis it is noteworthy that the chemotherapeutic agent and the growth factor are structurally related compounds being 1 4 derivatives of benzene This relationship suggests a mechanism of bacteriostasis largely determined by chemical structure In support of this conception we might compare the findings of Woods (1940) with those of Rubbo and others (1940, 1941) Although these two groups of workers were primarily concerned with widely separated problems the results have certain features in common In the first place, they were dealing with organisms whose growth was inhibited by sulphanilamide, and secondly, this inhibition was reversed in the presence of *p*-aminobenzoic acid

---

[†] A similar table has been published in *Nature* (Rubbo and Gillespie 1940) with some *errata* owing to a lack of proof reading the present table II is the correct record of the results

The findings illustrated in fig 1 reveal a striking correlation between anti-sulphanilamide ratio on the one hand and growth-factor activity on the other It will be seen that *p*-aminobenzoic acid (2), *p*-nitrobenzoic acid (4), procaine (6) and *p*-aminobenzamide (7) are equally active as growth factors and as anti-sulphanilamide agents Furthermore all these substances conform to the 1 4 di-substituted benzene ring structure As it has been shown by Rubbo and others (1941) that *p*-aminobenzoic acid is formed from *p*-aminobenzaldehyde by oxidation, from *p*-nitrobenzoic acid by reduction and from procaine by hydrolysis, there is no essential difference in function between these compounds and *p*-aminobenzoic acid Again, the inactivity of the substances 10 to 15 in fig 1 is consonant with the supposition of specific interference It is interesting to note that when compared with the *para* acid, the *ortho* and *meta* aminobenzoic acids (8 and 9) are practically devoid of growth-stimulating properties (Rubbo et al 1941) and equally of anti-sulphanilamide action (Woods 1940) It is also well known that the *ortho* and *meta* isomers of sulphanilamide are devoid of chemotherapeutic activity Thus it appears that, in the present discussion, the structural configuration of a chemotherapeutic agent must conform to the structural pattern of an essential growth factor or metabolite for the organism Such an idea of specific inhibition determined by chemical configuration is illustrated in fig 2

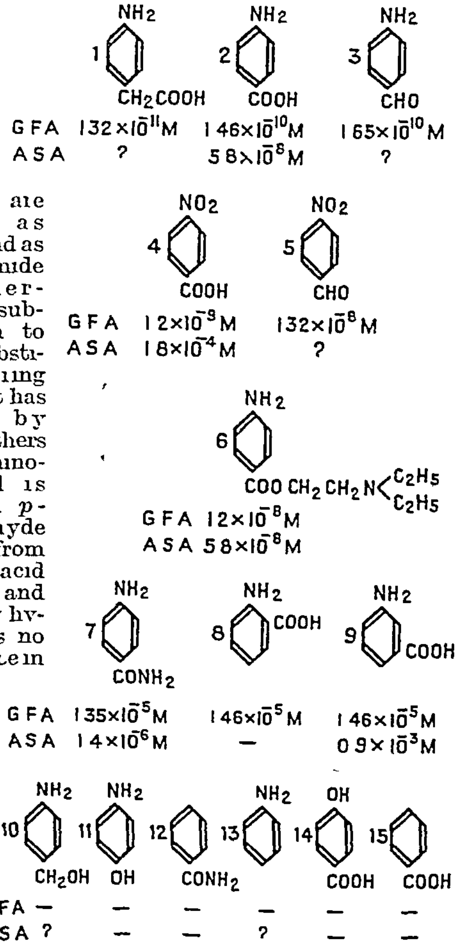

GFA 1 32×10⁻¹¹M ASA ?
GFA 1 46×10⁻¹⁰M ASA 5 8×10⁻⁸M
GFA 1 65×10⁻¹⁰M ASA ?
GFA 1 2×10⁻⁹M ASA 1 8×10⁻⁴M
GFA 1 32×10⁻⁸M ASA ?
GFA 1 2×10⁻⁸M ASA 5 8×10⁻⁸M
GFA 1 35×10⁻⁵M ASA 1 4×10⁻⁶M
GFA 1 46×10⁻⁵M ASA —
GFA 1 46×10⁻⁵M ASA 0 9×10⁻³M
GFA — — — — — —
ASA ? — — ? — —

FIG 1—Findings of Rubbo and others (1940, 1941) and of Woods (1940), showing correlation between growth factor activity (G F A) and anti sulphanilamide activity (A S A)

— indicates substance inactive at 10^{-3} M
? „ „ not tested

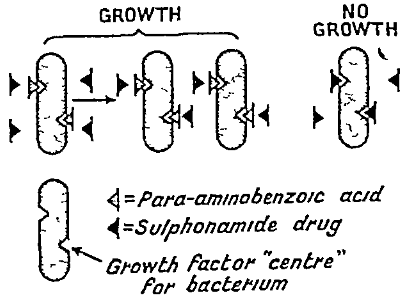


FIG 2

One outstanding exception to this remarkable correlation is worthy of mention Although *p*-aminophenylacetic acid (1 in fig 1) was the most active growth factor of the series tested it was found (by experiments which have not been described) to be devoid of any anti-sulphanilamide action This finding has also been confirmed by Landy and Wyeno (1941) who reported that the acid was not an anti-sulphanilamide agent As a corollary to what has already been said it is anticipated that *p*-aminophenylmethanesulphonamide which bears the same relationship to *p*-aminophenylacetic acid as sulphanilamide to *p*-aminobenzoic acid, will function as a bacteriostatic agent towards *Cl acetobutylicum* (W), and possibly towards other organisms insensitive to sulphanilamide—*Streptococcus fæcalis* and *Cl œdematiens* It has been reported (Miller et al 1940) that this substance did not exhibit any significant protective action against experimental streptococcal infections in mice on the administration of a single dose of the compound An approach similar to that described above was adopted by McIlwain (1940), who demonstrated that the growth of proteus and staphylococcus is inhibited by pyridine-3-sulphonic acid when the organisms were cultivated in a medium containing nicotinic acid (pyridine-3-carboxylic acid) as the growth factor

The quantitative ratio of the amount of sulphanilamide inactivated by *p*-aminobenzoic acid is important It has been shown that the ratio is approximately 26,000 1—that is, 26 g of sulphanilamide is inactivated by 1 mg of *p*-aminobenzoic acid Two interpretations of this tremendous disproportion seem to be open to us First, it might be assumed that *p*-aminobenzoic acid has a greater affinity for the organism than sulphanilamide, and thus can displace the latter even after contact has been made with the specific enzymic " centre " Secondly, it is possible that some organisms receive chance protection by *p*-aminobenzoic acid (roughly 1 in every 26,000), and that these few survivors account for the growth recorded after 48 hours' incubation

MacLeod (1940) has demonstrated that extracts of normal and autolysed tissues, pus, and certain sterile serous effusions (secondary to acute rheumatic fever) possess anti-sulphanilamide properties, while blood serum, fresh kidney and liver are inactive These findings, taken in conjunction with our own, seem to indicate that local application of sulphanilamide (or sulphonamides generally) to infected wounds is a wasteful procedure in which the effectiveness of the drug is tremendously reduced by traces of active inhibitors present in the damaged tissue and pus Accordingly, the surgical rationale of packing wounds with at least 10 g of the drug when only traces are required in the serum to treat septicæmic infections might be explained on this basis The results of local sulphonamide therapy do not appear so remarkable when it is considered that in experimental wound infections with gas-gangrene organisms Hawking (1941) stated that 0 1% solution of proflavine achieved a similar result to that obtained with solid sulphathiazole While we do not wish to cast suspicion on the efficacy of local sulphonamide prophylaxis, the fact that only traces of *p*-aminobenzoic acid and related compounds, which are probably present in damaged tissue, are capable of destroying its action is worthy of serious consideration

The results of this investigation have direct bearing on the conclusions of Fildes, in that the antibacterial substance, sulphanilamide, specifically interferes with the normal function of the growth factor of the cell, *p*-aminobenzoic acid His remark that " chemotherapeutic research might reasonably be directed to modification of the structure of known essential metabolites to form products which can block the enzyme without exhibiting the specific action of the metabolite " seems to be justified by these experiments

REFERENCES

Ansbacher, S (1941) *Science*, 93, 164
Fildes P (1940) *Lancet* i 955
Hawking, F (1941) *Brit med J* ii, 263
Landy, M and Wyeno, J (1941) *Proc Soc exp Biol* N Y 46, 59
McIlwain, H (1940) *Brit J exp Path* 21 136
MacLeod C M (1940) *J exp Med* 72, 217
Miller E Sprague, J M Kissenger L W and McBurney, L F (1940) *J Amer chem Soc* 62 2099
Rubbo S D and Gillespie J M (1940) *Nature Lond* 146 838
— Maxwell M Fairbridge R A and Gillespie (1941) *Aust J exp Biol* In the press
Woods, D D (1940) *Brit J exp Path* 21, 74

THE DYSPEPTIC SOLDIER

A RECORD OF 931 CONSECUTIVE CASES

WILLIAM BROCKBANK, M.D CAMB . F R C P.
LIEUT -COLONEL, R A M C
(From a military hospital in England)

WAR had not been long declared before it was realised that the medical services of the Army were facing a problem which had caused no particular anxiety during the war of 1914–18 In that war the headings ' indigestion,' 'inflammation and ulceration of the stomach" and "other diseases of the stomach" occupied the eleventh, twelfth and ninth places in the order of incidence of diseases, being preceded by rheumatic fever, disorders of locomotion. diseases of the respiratory system, of the intestines, of the nervous system and of the skin: venereal disease; and influenza (Willcox 1940) The intervening years had brought to this country a vast increase in incidence of dyspepsia and in particular of gastric and duodenal ulceration. and it was this increase that was responsible for the trouble It has been recorded that a firm of retail chemists who own about a dozen shops in an industrial area sell half a ton of alkaline powder to their customers in a month (Turner 1941)

Various figures have been given of the present incidence of dyspepsia in the Army During the period between the dispatch of the B E F. to France and April 29 1940 12 5% of all cases sent home to the United Kingdom had a primary diagnosis of gastric or duodenal disease (Payne and Newman 1940) If the emergency evacuation of the base hospitals (when even minor illnesses were sent home) is excluded the figure is 14 4% This represents only a portion of the total dyspeptic cases in the base hospitals in France but even so the figure is much higher than that for cardiac cases, for example Payne and Newman investigated 287 of these evacuated cases in which a primary diagnosis suggested a gastric or duodenal lesion and their figures of positive findings are necessarily high, they found that 89% had gross organic disease

TABLE I—ADMISSIONS IN EIGHTEEN MONTHS

Month	Patients admitted	Number dyspeptics	% of total admitted	% of dyspeptics returned to duty without X-ray exam	% dyspeptics proved organic	Number ulcer cases †	% of ulcer cases		
							Gastric	Duodenal	Pyloric
1939									
Sept.	475	46	10	32 5	37	17	35 3	47	17 6
Oct	776	51	6 6	18	55	26	12	73	15
Nov	737	59	8	10	44	25	20	68	12
Dec	702	50	7	22	52	25	28	64	8
1940									
Jan	705	55	7 8	11	40	20	0	75	25
Feb	523	53	10	5 5	47	25	12	72	16
March	640	52	8	5 8	44	23	17	61	22
April	682	73	10 7	2 8	48	34	15	79	6
May	570	63	11	4 9	60	38	5	79	16
June	478	45	9 4	3 3	38	17	11	71	18
July	508	57	11	5 2	40	22	13 5	63 5	23
Aug	546	48	9	8 3	37	18	11	67	22
Sept	526	37	7	8	35	12	0	92	8
Oct.	618	49	8	4	40	19	16	68	16
Nov	638	46	7 2	4	33	15	13	87	0
Dec.	600	54	9	7 5	33	24	12 5	75	12 5
1941									
Jan.	649	49	7 5	10	28	14	14	57	29
Feb	550	44	8	7	29	13	0	77	23
Total	10,923	931	8 5	9 2*	42 5	387	13 3	71 4	15 3

* Excluding first five months 5 8%
† The organic group also contained 1 case of carcinoma and 9 of gastro-enterostomy in which there was no precise evidence of the site of the ulcer

This paper is chiefly concerned with a statistical survey of the problem as it presented itself at one of the largest military hospitals in the country. The fifteenth patient admitted to the hospital was the first of a long series of dyspeptics, of the first 150 patients 21 complained of dyspepsia (14%) By the end of February 1941—eighteen months after war started—a grand total of 10 923 other ranks had been admitted, of these 931 (8 5%) were dyspeptics (table I)

Most of these cases were put through the same routine All were examined carefully after a detailed history had been taken. Most of them had a bismuth meal and a fractional gastric analysis In the early days it was the practice to order these examinations only if it was considered they were likely to reveal any abnormality This meant that a considerable proportion (32 5%) were sent back to their units in September 1939 without either of these examinations (table I) Routine bismuth meals and fractional gastric analyses were soon instituted for all dyspepsias except those of very recent origin (for example cases with only two or three weeks' vague history, or those whose symptoms seemed to be due to constipation only), thus during the whole of the last thirteen of the eighteen months under review only 5 8% of all dyspeptics were returned to their units after a purely clinical examination and treatment This meant that the R M O could be presented and the patient confronted with negative X-ray and pathological findings and these seemed to mean much more to them than our carefully considered opinion based on purely clinical grounds

TABLE II—PUBLISHED FINDINGS IN PATIENTS ADMITTED TO SERVICE HOSPITALS IN THE PRESENT WAR

Authors	Type of hospital	Total cases	Ulcers %	Number gastric	Number duodenal	% of ulcers duodenal
Allison and Thomas	Naval	100	45	6	34	85
Brockbank*	Military	931	42 5	52	275	84
Graham and Kerr	,	246	64	23	135	85
Maingot	General	256	56	15	128	89
Morris	Military	500	50			
Payne and Newman	E M S	287	89	42	164	80
Spillane	Military	over 200	32	10	54	84
Willcox	E.M.S	41	69	7	19	73

* Includes 1 case of carcinoma and 9 of gastro-enterostomy in which there was no precise evidence of the site of the ulcer

For the purpose of this series of cases I am defining as proved cases of ulcer those who had positive X-ray findings fitting in with the clinical picture those who had had a gastric operation with recurrence of symptoms and those who had had hæmatemesis or had passed definite black tarry stools The only case of carcinoma of the stomach that we saw is included in the general figures The vast majority of these dyspepsias originated in civilian life I have no figures with which to prove this but we always took great interest in cases of proved ulcer that seemed to have originated during Army life. I doubt whether in the whole series there were more than a dozen—about 1% of all dyspeptics and 2% of all cases of proved ulcer

It was thought at the beginning that all the dyspeptics would soon be weeded out of the Army and that therefore the numbers admitted would fall off considerably but that did not prove to be so The eighteen individual monthly figures show that the largest number of dyspeptics admitted was 73 in April 1940 and the smallest 37 in September 1940 (table I) the monthly average was 52 The average admissions for the first six months was 52 for the second six months 56 and for the last six months 47, the problem is in fact, still present almost as badly as it ever was Of these 931 cases of dyspepsia 397 (42 5%) were considered to be cases of peptic ulcer This percentage fell off in the last four months In the first six-month period it was 46% in the second 44% while in the third it had dropped to 33% The number of cases of proved ulcer thus showed a definite decline My average figure agrees well with that of Allison and Thomas (1941) who reviewed 100 cases of sailors and marines with dyspepsia and demonstrated a gastric or duodenal ulcer radiologically in 45% Several other series of figures have been published (table II)

Spillane's (1941) figures covered twelve months and are described as cases of chronic dyspepsia Morris's (1940) figures are based on 500 cases sent for X-ray examination and cover many of the cases in the present series His percentage figure is bound to be higher than mine because his series does not cover those cases with mild symptoms not considered worthy of X-ray examination. Maingot's (1941) series deals with 256 soldiers referred to a general hospital on account of dyspeptic symptoms. Those of Graham and Kerr (1941) were drawn from all branches, Navy, Army, Air Force and Women's Auxiliary Services, those from the Army preponderating. They cover a period of fourteen months in a military hospital. Willcox's (1940) material was 260 medical cases sent from France to sector hospitals in this country, and must be presumed to consist only of the more severe grades of dyspepsia, severe enough to merit being sent back from France. The same applies even more to the figures of Payne and Newman (1940), for their 287 patients already suggested a gastric or duodenal lesion before they were asked to see them, small wonder that their percentage of ulcers is so high.

DISPOSAL

In the early days of the war it was our habit to return to duty cases of proved ulcer in which the lesion did not appear to be particularly active. In September, 1939, 50% of the cases were returned to their units (table III). This proved to be a mistake, for the men became a nuisance. In October, 1939, only 29% were sent back to duty. Thereafter it was decided to board out of the Army all cases of proved ulcer with symptoms. For the remainder of the eighteen months only 7% of these cases were sent back to duty. These in the main consisted of men whose symptoms seemed to be trivial despite the X-ray diagnosis and of senior N.C.O.s who were anxious to remain in the Army and who were thought to be in a position to modify the Army food to their own particular needs. This was not in accordance with Army regulations, for even in peace-time it was held that peptic ulceration was incompatible with Army routine even when the man was billeting himself at home. But the problem of disposal was causing so much trouble that the Army authorities issued, in March, 1940, the following instruction to presidents of medical boards for their guidance in dealing with gastroduodenal cases:

a Chronic cases with long standing history consistent with gastroduodenal lesion together with evidence of physical manifestation (e.g., deficient nutrition, anæmia, abdominal tenderness) should be recommended to be transferred to a lower class than that in which they are at present serving.

b (1) Cases exhibiting active gastroduodenal symptoms with proved organic lesions, and (2) cases with history of past operation for perforation or gastrectomy or a short circuit operation, and with recurrent symptoms of active ulceration or recent hæmorrhage with radiological evidence of active ulcer, should be recommended to be discharged as permanently unfit for military service.

These instructions rather suggested that a radiological lesion must be detected before a man could be discharged from the Army. Seven months later this impression was corrected by the circulation of an epitome of a report by the consulting physician to the Army ("Conferences with Medical Officers and Tours"):

Peptic ulcer.—The War Office letter [quoted above] relates to certain recommendations for the guidance of presidents of medical boards in dealing with gastroduodenal cases. It may be argued that these recommendations preclude the invaliding of cases not proved radiologically to exhibit an active ulcer. Lowering of category in such cases is, however, useless as they will relapse in any category. Where a case is clinically one of peptic ulcer and the radiologist's report gives a diagnosis such as duodenitis and duodenal irritation, &c., in which the radiologist finds certain abnormalities in the duodenum, the case for the purpose of boarding should be regarded as one of duodenal ulcer.

Where cases are diagnosed on clinical grounds and the X-ray findings are negative presidents of medical boards are not excluded from accepting such cases as peptic ulcer. Each case should, however, be judged on its merits. Such cases must be given careful consideration and it would be unwise for him to be invalided out of the Service unless the board is reasonably satisfied with the evidence.

Dyspepsia and gastritis.—Cases of dyspepsia and gastritis which occur frequently in an intake shortly after joining should be retained with the unit, during their earlier period of training, in spite of repeatedly reporting sick. Simple remedies from the unit medical officer relieve the condition. Hospital treatment does not assist in inducting the required adaptation to the new environment in the Service and relapses consequently take place.

Finally in February, 1941, another War Office letter was issued in which the situation was clearly explained:

Disposal of gastroduodenal cases.—A soldier whose case falls into any one of the groups mentioned below should be recommended for discharge from the Army as permanently unfit for military service:

1. Chronic cases with a well authenticated long standing history consistent with the presence of gastroduodenal lesion in which there is evidence of physical manifestation such as for example, deficient nutrition, anæmia or abdominal tenderness.
2. Cases exhibiting active gastroduodenal symptoms with a proved organic lesion, or
3. Cases with a history of past operation for perforation.

During the whole period of 18 months, therefore, 90% of cases of proved ulcer were discharged from the Army, a total of 351 cases. The percentage is higher if the first two months are discounted, in which case 93% of proved ulcers were discharged (table III). Of the 397 cases of proved ulcer 13.3% had gastric ulcers, 15.3% pyloric ulcers and 71.4% duodenal ulcers (table I). These figures agree remarkably with figures published elsewhere if the indeterminate pyloric ulcers are excluded (table II).

TABLE III—DISPOSAL OF DYSPEPTICS

Month	WITHOUT PROVED ORGANIC LESIONS Cases*	Returned to duty		Category E		WITH PROVED ORGANIC LESIONS Cases‡	Returned to duty		Category L	
		No	%	No	%		No	%	No	%
1939										
Sept	22	20	90	2	10	14	7	50	7	50
Oct	23	21	91	2	9	28	8	29	20	71
Nov	33	30	90	3	10	26	2	8	24	92
Dec	24	23	96	1	4	26	1	4	25	96
1940										
Jan	33	32	97	1	3	21	4	19	17	81
Feb	28	23	82	5	18	25	3	12	22	88
March	29	27	93	2	7	23	1	4	22	96
April	38	35	90	3	10	35	3	9	32	91
May	25	24	96	1	4	38	2	5	36	95
June	28	25	89	3	11	17	1	6	16	94
July	34	30	88	4	12	23	2	9	21	91
Aug	30	28	93	2	7	17	2	12	15	88
Sept	24	22	92	2	8	13	0	0	13	100
Oct	28	25	89	3	11	20	2	10	18	90
Nov	31	30	97	1	3	15	1	7	14	93
Dec	30	30	100	0	0	24	0	0	24	100
1941										
Jan	35	32	91	3	9	13	0	0	13	100
Feb	31	28	90	3	10	13	1	8	12	92
Total	526	485	*90*	41	*10*	391	40	*10*	351	*90*
Ex 2 m†	481	444	*92*	37	*8*	349	25	*7*	324	*93*

* Eight cases transferred to other hospitals are excluded.
† Excluding first two months.
‡ Six cases are excluded. Five of these were transferred to other hospitals, and one patient with carcinoma of the stomach died.

There remain to be considered the 534 cases in which no ulcer could be found. These comprise cases of clinical ulceration not confirmed radiologically but usually confirmed by fractional gastric analysis, cases in which no ulcer appeared to exist (i.e., cases of hyperacidity, hypoacidity and nervous dyspepsia), and a few in which there did not appear to be anything wrong at all. Of this group of cases, throughout the full eighteen months, 90% were returned to duty, mostly without any lowering of category, and the remaining 10% were dicharged from the Army on purely clinical grounds (table III). It is to be regretted that a sudden transfer prevented the working out of statistics based on fractional gastric analyses. The men who were sent back to duty went with a somewhat disgruntled air but they very rarely returned to us, they seemed to realise that they had had a fair examination and were unlucky; there was nothing else to do, therefore, but get on with the war. Some of them had an increased acidity, if this was well-marked, the R.M.O. was advised to prescribe alkalis. If it was very high the man was put in category C. A considerable number had lowered or absent acidity, in most of these it was not considered that this was the cause of the symptoms. If, on the other hand, it ld appear to be the cause then the R M O was advised f possible to give the man min 20 of dilute hydrochloric acid well diluted in water before the principal meals of the day

All this has meant that a large amount of hospital accommodation has been taken up The cases sent back to duty remained in hospital on an average thirteen days (table IV) Those boarded out were in hospital a variable period depending on the Army's current method of procedure for these cases as well as on our own slickness In September 1939, each category E patient was in thirty days on an average In successive months, however, this figure fell until in April, 1940, they were actually discharged from hospital ten days after admission The authorities then tightened up the procedure and the figure at once rose into the twenties, where it remained for nine months with one exception

TABLE IV—NUMBER OF DAYS IN HOSPITAL

Month	Cases returned to duty			Category E		
	Av	Max.	Min	Av	Max	Min
	(days)			(days)		
1939 Sept	13	41	4	30	35	18
Oct	16	42	5	19	29	11
Nov	16	41	8	15	23	9
Dec	13	31	5	12	30	3
1940 Jan	13	46	6	12	29	4
Feb	16	38	4	14	46	4
March	14	36	5	13	42	3
April	12	25	7	10	19	3
May	10	18	6	12	33	6
June	9	17	4	19	29	10
July	12	28	3	24	37	12
Aug	11	40	5	21	31	15
Sept	12	33	4	23	44	12
Oct	13	28	8	21	62	11
Nov	15	32	8	22	37	12
Dec	16	39	7	26	50	7
1941 Jan	15	39	6	22	30	9
Feb	13	27	8	18	27	7

MALINGERING

True malingering was rare But there was a type of case that complained of vomiting after every meal and yet contrived to look uncommonly fit on it This vomiting was done without eye-witnesses and appeared to cease directly the man was forced to vomit in public These patients probably exaggerated their symptoms Most of them had been to hospital once or twice, their story being more spectacular on each occasion

It is to be regretted that some M O s fail to check up on a patient's symptoms before sending him to hospital I once admitted a case labelled threadworms We failed to find any clinical or microscopic evidence of these, but careful questioning elicited the information that the man knew he had worms because he could feel them biting his seat He was sent back to his unit and returned to us two days later with the diagnosis "Threadworms still present" To my great joy he told me he hadn't had his bowels opened since he had left us and that the M.O hadn't examined him at all So I rang up the M O and found, as I thought, that he had never seen any threadworms himself, and hadn't even looked for any, he had accepted the man's story without question He admitted that if he had known the man felt them biting him he wouldn't have sent him to me, though he might have troubled the psychiatrist I sent the man back with the promise that if any ocular evidence of worms could be produced I would readmit him with pleasure, but he never came back

DURATION OF SERVICE AND ITS EFFECT

I have unfortunately no accurate figures of my own to show how long the men with peptic ulcers had been on Army service I am, however, indebted to Colonel W W Browne president of the Western Command standing medical board, for the following figures, based on his own records

Of all the men discharged from the Army through his board during a certain period 14 2% were suffering from gastric or duodenal ulcer, in addition 3% were discharged for chronic gastritis

All the cases were radiologically positive except for a small proportion discharged on account of either recurrence of symptoms after operation or an enlarged duodenal cap with the addition of the typical duodenal type of hyperacidity Periods served were as follows

	%
Less than 1 month	1 6
1–3 months	14
4–6 months	12 4
7–12 months	26
More than 12 months	46

Most of these cases gave a history of many years' standing Many of them were actually on a strict diet (milk, eggs and fish) up to the time they were called up They found that they were unable to digest the meat and in particular the stews They also complained of the excess of greasy foods, though this complaint is heard much less now than it was in the early months of the war In a large proportion it was possible to obtain a history that during the early months of the war the man had managed to buy enough food outside to keep going without eating the army meat Sometimes a man was lucky enough to be in good lodgings where he was able to diet and sometimes he was even luckier in that he was able to live at home Then suddenly he was moved and since the same facilities were no longer available the symptoms returned and he had to report sick

DISCUSSION

It is not unnatural that the civilian medical boards have come in for some degree of criticism for passing so many dyspeptics into the Army Their instructions for the guidance of medical boards under the Military Training Act, 1939, are clear.

> Gastric and duodenal ulcer If a man gives a history or brings a certificate suggesting the existence of an ulcer of the stomach or duodenum and has undoubtedly had hæmatemesis or melæna within a recent period of time, the presence of an ulcer may be assumed and he should be placed in grade IV, or deferred for 6 months Cases of recent operation such as gastro-enterostomy should be deferred for 6 months and then reconsidered On the other hand the mere complaint of indigestion with abdominal pain, even if extending over some years, is not a bar to placing the man in the grade for which he is otherwise suitable, and many men with these symptoms may be placed in grade I or II

In fairness to these civilian medical boards there is another side to the matter Critics have thought that they should be more strict about passing gastro-intestinal cases into the Army, the psychiatrists say the same about psychiatric cases, the ophthalmologists say the same about eyes, the cardiologists and neurologists and orthopædic surgeons all say the same about their bit of the human body. In fact if the members of these boards listened to all the specialists both civilian and military, our Army would not have enough men to fight on as many fronts as we are doing Let it be freely admitted that these boards have done their job very well indeed and that it is wrong to criticise them in the way they are apt to be criticised Where there is a doubt about a man's fitness for service the R A M C provides the best means of making an accurate decision and that means that the civilian boards must pass the man through in the first instance so that the Army can make the decision

There seem *to be two morals in all this* First, it is vitally necessary to find out the cause of the great increase in ulceration of the stomach and duodenum, but that hardly comes within the province of the Army physician Secondly, all cases of possible peptic ulceration need to be carefully examined and classified clinically, radiologically and often pathologically by skilled medical men, and in cases of doubt the Army authorities are the best for the job Fractional gastric analysis is particularly useful examination for occult blood is not so useful

There is no increase in the incidence of peptic ulceration as a result of the war What the present war has revealed is that peptic ulcer and gastritis were unexpectedly common in the civilian population before the war began and the fact, not altogether surprising, that organic dyspepsia is incompatible with Army life

SUMMARY

A series of 931 consecutive cases of dyspepsia admitted to a military hospital during the first eighteen months of

the war are analysed They represented 8 5% of all admissions The monthly average throughout the period was 52 and was more or less constant

Of these 397 (42 5%) were considered to be cases of peptic ulcer This percentage fell in the successive six-monthly periods, being 46%, 44% and 33% After the first two months of the war only 7% of these cases were sent back to duty the rest were discharged from the Army

Of the total ulcer cases 13 3% had gastric, 15 3% pyloric and 71 4% duodenal ulcers, most of these gave a history of many years duration

A group of 534 (57 5% of the total dyspeptics) were considered to have no peptic ulceration, 90% of these were returned to duty, mostly without any lowering of category, the rest being discharged from the Army

Every case of dyspepsia of more than a month's standing should be examined clinically and radiologically If possible a fractional gastric analysis should be carried out

Of all men discharged from the Army through a particular command medical board during a particular period, 14 2% were suffering from peptic ulcer, 54% of these were discharged after less than 12 months' service

There is no evidence of an increase in peptic ulceration as a result of the war, but the war has revealed the unsuspected commonness of peptic ulcer and gastritis in the civilian population before the war began It is vitally necessary that the cause of the great increase in peptic ulceration since the last war should be determined

I wish to thank Major Hugh Morris, Major W F Mair, and Major R W Fairbrother for their help

REFERENCES

Allison, R S and Thomas A R (1941) *Lancet*, i, 565
Graham, J G and Kerr J D O (1941) *Brit med J* i 473
Maingot R (1941) *Ibid* i, 533
Morris, H (1940) *Ibid*, ii 235
Payne, R T and Newman, C (1940) *Ibid*, ii, 819
Spillane, J D (1941) *Ibid*, i 333
Turner, H M S (1941) *Ibid* i, 605
Willcox P H (1940) *Ibid*, i, 1008

DISTURBANCES OF THE BODY SCHEME

ANOSOGNOSIA AND FINGER AGNOSIA

JOHN D SPILLANE M D WALES, M R C P
MAJOR R A M C

THE term "body scheme" was introduced by Head and Holmes (1911) to signify the concept which a person develops of his own body The body "scheme," "image" or "pattern" means the picture of the body which is formed in the mind It became evident to these observers while studying the sensory activity of the human cortex that "one of the faculties which we owe to cortical activity is the power of relating one sensation to another, whether they arise simultaneously or consecutively" The sensory cortex becomes a storehouse of sensory experience, it receives impressions, stores them and judges new ones in the light of its experience A standard is formed against which incoming impressions are modified and subsequent conduct determined In the formation and maintenance of this plastic body image the importance of optical and postural impressions is therefore to be expected An obvious corollary is that distortion of our own postural model may be associated with loss of orientation in regard to the bodies of other people Finally, lesions of the sensory cortex may be expected to result occasionally in disorders of the body scheme

ANOSOGNOSIA

The term "anosognosia" was first used by Babinski (1914) and means unawareness of disease He reported the cases of 2 hemiplegics who were unaware of their paralyses Unawareness of blindness had been described by C von Monakow (1885) in a patient with bilateral disease of the occipital lobes, and unawareness of deafness by Anton (1899), the latter also described lack of recognition of hemiplegia following Pick's original observation in 1898 It has been pointed out (Nielson 1938) that anosognosia is a general term, applied to disease as a whole, but that Babinski used it in a specific sense By anosognosia Babinski meant unawareness of hemiplegia and as such the term has remained Cases have since been reported, however, in which, as Meige suggested in the discussion following Babinski's paper the limbs and not the paralyses have passed out of consciousness In its mildest form the disorder may merely be a periodic "forgetting" of a limb (Alajouanine et al 1934, von Stockert 1934, Ives and Nielsen 1936), a delusion that can be corrected by persuasion and argument In such cases the limb disappears from the attention rather than from consciousness In other cases one whole side of the body may disappear from consciousness (Barkman 1925)—a *negative* condition (Koch and von Stockert 1935) to be distinguished from a *positive* feeling or delusion of absence of the side, such as was observed in 2 cases by Ives and Nielsen (1937) In most reported cases a period of disturbance of consciousness preceded the development of the anosognosia, but there are exceptions (Babinski 1918, and von Hagen and Ives 1937)

Where there existed true imperception of hemiplegia the paralysis was always on the left side, together with homonymous hemianopia In the only 4 cases in which autopsy reports are available a lesion of the right optic thalamus was observed Pick's case had chronic diffuse meningitis with softening in the right thalamus and first and second right temporal convolutions Potzl's (1924) second case revealed superficial softenings in the right parietal and occipital lobes with a large area of vascular necrosis in the right thalamus. In his first case there were left hemianæsthesia and in the second homonymous hemianopia The case described by von Hagen and Ives showed left homonymous hemianopia, left hemiplegia and hemianæsthesia, unawareness of hemiplegia At autopsy there were several metastatic cerebral abscesses, one involving the right thalamus, caudate nucleus, globus pallidus, internal capsule and adjacent structures Thus, in genuine anosognosia (imperception of hemiplegia) the constant finding of a lesion in the right optic thalamus suggests that the trouble lies in the failure of sensory impulses from the paralysed side to reach consciousness

In the second type of case—that in which there need be no hemiplegia and no unawareness of disease but in which there is periodic "forgetting" or absence from consciousness of a limb or of one side of the body—the lesion does not so constantly affect the thalamus It is usually more superficially situated in the parietal cortex so that the disturbance is not merely one of non-perception of impulses There is then a true distortion of the body scheme resulting from a lesion at a higher level In the first of the 2 cases reported by Ives and Nielsen (1937) the causative lesion was an area of vascular softening in the *right* retrolenticular portion of the internal capsule partly involving the thalamus The patient was aware of his paralysis (left hemiplegia) but denied that the paralysed limbs belonged to him, he thought they belonged to the doctor In their second case the patient similarly refused to acknowledge that his paretic left arm was really his own "Someone is substituting this arm for my left arm," he repeatedly stated At autopsy there was diffuse vascular softening of the right cerebral hemisphere It involved the lenticular nucleus but not the thalamus

CASE 1

An officer cadet was admitted to a military hospital in May, 1940, complaining of severe occipital headache of sudden onset a few hours previously Temperature 99° F, pulse-rate 90 per min He showed neck rigidity, spinal tenderness, brisk knee and ankle jerks and a positive Kernig sign, plantar responses were normal Lumbar puncture produced a sterile blood stained fluid He remained fairly well for a week and further puncture indicated that there had been no fresh bleeding Then signs of severe meningeal irritation developed, with bilateral extensor responses, extreme spinal rigidity and much headache It was found necessary to tap him daily, for papillœdema rapidly developed with retinal hæmorrhages, recurrent coma and general deterioration He lost flesh alarmingly and was gravely ill for several months Unconscious periods occurred frequently and on a few occasions he ceased breathing Artificial respiration was repeatedly employed and frequent lumbar puncture released deeply stained fluid under high pressure (360 mm) of water There was every indication of a constant seeping of blood from an intracranial aneurysm over a period of two months Root pains were excruciating at times and large doses of morphia became necessary. After three months the cerebrospinal fluid began slowly to clear. He was then poorly orientated except for short lucid intervals and both optic discs were choked and his legs spastic.

Then, one morning, he told me that there was no room for "him"—some other person—between his own body and the wall. It soon became evident that he thought this other person was "somebody in bed—over here" (pointing to his left side). Asked how long this 'he' had been there he replied "all the time—he moves about." This delusion persisted all day, but that evening he became violent and tried to get out of bed. He slumped to the floor unconscious. The following morning it was noticed that he had a left sided hemiplegia and there was a recurrence of subarachnoid bleeding. There was only slight left facial weakness, but little movement was possible in his left arm or left leg. Biceps, triceps and supinator jerks were present but very sluggish; there was no grasp reflex; abdominal reflexes were absent on both sides; knee- and ankle jerks on the left side were feebly present; tendon jerks on the right side were hyperactive; there was a positive extensor response on the left side and a doubtful positive response on the right. His head and eyes were turned to the right and he talked volubly. He had now little pain and was euphoric. There was general diminution of response to touch and pin prick over the left side of the body, more definite in the left arm. Responses were variable and often incorrectly interpreted. Pin-prick was more affected than touch. Position sense was much reduced in the left arm, while in the leg it was poor. He did not realise that he could not move his left arm and leg. He frequently indicated with his right arm that he thought he had been touched on the right thigh whereas he had been touched on the left thigh. When asked to move his right arm and leg he did so correctly, but when asked to move his left limbs he moved his right. Asked how his left arm and leg felt he replied, "Fine." When I told him that he could not move his left arm and leg he smiled and said, "That arm is all right." When his left arm was held up in front of him he said, "That was the one—he presses on me—these beds are small."

During the next few days his general condition remained unchanged but his memory deteriorated, especially for very recent events, and he chatted continuously. He persisted in asserting that his arms and legs were not weakened and on several occasions he was forcibly restrained from getting out of bed. As far as one could judge there was no hemianopia. Five days after the onset of the hemiplegia, when there was slight return of power, he was persuaded after much argument that the paretic limbs held up for him to see were actually his own. But when they were covered up again, and he was requested to move them, he merely moved his right limbs.

In the next five months no further bleeding occurred and power was eventually much restored in his limbs. Postural sense was the first to be restored and the alloæsthesia and polyæsthesia disappeared completely. With return of muscular power came a return of normal orientation about the left limbs. About six weeks after the onset of the hemiplegia he was able to raise his left arm and leg on request. Eight months after the onset of his illness he walked out of the hospital unaided. When last heard of, two months later, he had continued to improve.

It was conjectured that the bleeding had come from a congenital intracranial aneurysm, possibly placed on the right middle cerebral artery, which had ruptured into the subarachnoid space and later into the substance of the right parietal lobe.

FINGER AGNOSIA AND CONFUSION OF RIGHT AND LEFT

In 1924 Gerstmann described a condition of finger agnosia, confusion of right and left, acalculia and agraphia, due to a lesion in the left parieto-occipital area of the brain. There was difficulty in recognising, naming, selecting, differentiating and indicating the fingers of either hand, the patient's own as well as those of others. To this condition he gave the name "finger agnosia." The disorientation for right and left applied to the patient's own body and to that of others. Acalculia (difficulty in calculating) and agraphia (difficulty in writing) were less constant. General confirmation has since been obtained (Herrmann and Potzl 1926, Lange 1930, Marburg 1931, von Stockert 1931, Muncie 1935, Mayer-Gross 1935 and Nielsen 1938). The finger agnosia is usually more noticeable in relation to the three middle fingers; the thumb and index fingers are less often and less severely affected. The toes are not implicated. In contrast to the person with anosognosia this type of patient is mentally cooperative, alert and has no motor or sensory paralysis. Visual tactile and postural comprehension are unaffected, but the patient may be poorly orientated for time. Unconsciousness does not occur during the period of observation of the symptoms. Although the finger agnosia may exist by itself it is usually accompanied by difficulty in right and left orientation. Actions dependent on correct self-lateralisation are thus performed with difficulty. The agraphia is more apparent in attempts at spontaneous writing than in copying and is not a constant feature. The acalculia is demonstrated by frequent errors in simple arithmetical calculations. The position and sequence of the digits within a figure are not appreciated.

In Gerstmann's (1924) first case no autopsy was available but he postulated a vascular lesion in the region of the left angular gyrus. This was substantiated by the finding by Herrmann and Potzl (1926), in a similar case, of a neoplasm in that area. There have since been similar autopsy confirmations and it has been shown that the syndrome may appear at any time during the course of an illness produced by a lesion, vascular or neoplastic, in the parieto-occipital region. Perhaps the most striking feature of the syndrome is that, with one exception, the lesion has always been situated in the left cerebral hemisphere. In one of Herrmann and Potzl's cases the lesion was found to be in the corresponding area of the right hemisphere. This patient, however, was ambidextrous.

CASE 2

A recruit, aged 25, was admitted to a military hospital for observation, at the request of his unit medical officer. His drill instructor had observed that he could not differentiate between right and left. He was a tall, heavily built youth with a pituitary type of obesity, weighing 15 st. He was the only child of his father's first marriage. His maternal grandfather had some sort of speech difficulty and could not write. His mother and three of her sisters had suffered from Graves's disease. He developed slowly and did not begin to walk until his third year. At the age of 5 years he was still unable to talk properly and he did not begin school till he was 8. It was soon realised that he found reading difficult and that his sense of left and right was poorly developed, so he was sent to a special school and received private tuition until he was nearly 20. At the age of 12 he was examined by Sir James Purves-Stewart and a line of treatment and education arranged. He improved sufficiently to be employed by his father in a small factory as a sort of general overseer. He remained at this work until he was called up in 1940.

Confusion of right and left.—The most striking defect was his failure to orientate himself for right and left. When asked to show his right or left hand, he did so hesitatingly, and after much thought. But if requested to take two steps to the left and to turn right he was at a complete loss and would execute clumsy and confused movements. A request to touch his right ear or eye with his left hand led to further difficulty, but in most instances he was able eventually to carry it out. Mistakes were frequent when similar tests were applied to his heels and knees. Not only was he slow to execute commands involving correct lateralisation about his own body but also about that of others. Mirror tests showed similar difficulties.

Finger agnosia.—He could not identify all his fingers. Mistakes were made not only in laterality; he could not distinguish his ring from his middle finger and often failed to distinguish his index from either. The defect involved recognition and selection as well as naming. Asked to show his "right fifth," "left fifth," "left first" fingers he responded correctly. But asked to hold up his "left second," "right third," "right third," "left fourth" and "left first" fingers, he selected his left fourth, right second, left third, right third and right fifth fingers. When asked to name the fingers I touched he gave only 4 correct answers out of fifteen tests. The same tests repeated before a mirror, or with his hands crossed, gave even poorer results. When the tests were applied to my own fingers he was wrong 12 times out of 20. All tests were carried out with the aid of vision and there was no apraxia or astereognosis. Identification of the toes was normal, except for occasional mistakes in laterality.

Alexia and agraphia.—He understood what was said to him and carried out oral and—after much effort—written commands. Speech was normal, although rather slow and monotonous. He could not readily recall certain words. There was no difficulty in recognising or naming objects He could write from copy but only very slowly to dictation and with many spelling mistakes Words were often spelled phonetically and mistakes were not recognised He could tell the time, set the hands of a clock correctly and match and identify colours When asked to read he spelled out each word slowly, tried to pronounce it, and then, if it sounded familiar to him, would proceed to the next word It was apparent that he had difficulty in identifying letters and that only by appealing to his auditory memory could he read Letters such as b, p, q, r, d, g, h, m, n, v and w were repeatedly confused

Acalculia was to be expected in view of his lack of training and of his difficulty in identifying letters and numbers He could not distinguish the multiplication sign from the sign of addition, and division sign was meaningless The subtraction sign was recognised and understood, but nevertheless he could not subtract correctly in many instances Apart from the difficulty in deciphering symbols he made many mistakes in simple arithmetic

DISCUSSION

In the two disorders of the body scheme described the symptoms and signs seem to depend not only on the location of the lesion within the brain but also on the side of the brain affected In the case of a lesion in the right *thalamoparietal region, there may be unawareness of left* hemiplegia, periodic forgetting of the left arm or leg, or a disappearance of the left side of the body from consciousness The patient may deny that his left arm or leg belongs to him Disturbances of sensibility of a cortical type are usually present in the affected limbs and hallucinations of sensation, with transference (alloæsthesia) to the normal side, may appear In the second type of case a lesion in the left parieto-occipital area leads to disturbance on both sides of the body Confusion between right and left and finger agnosia appear, while there may sometimes be agraphia and acalculia Hughlings Jackson (1889), writing on the nature of the duality of the brain thought that there were greater mental defects, of a sensory kind, in left hemiplegia and that the lesion responsible was in the thalamus Head (1920, 1926) found that, in all forms of aphasia and amnesia, tests involving the appreciation of right and left were always poorly performed Tests for right and left in the mirror, however, were usually well done, except in those groups he described as having a semantic defect The lesion in such cases lay in the neighbourhood of the left supramarginal gyrus (parieto-occipital area) Schilder (1935) suggested that imperception on the left side of the body occurs more frequently than on the right because it is really an exaggeration of a normal tendency "A focal lesion added to this tendency will provoke the picture of imperception of the left side "

Why the fingers should be more susceptible to disorder in the body scheme is not understood The coincidence of finger agnosia acalculia and agraphia may result from proximity of cerebral localisation or because there is some deep similarity between them, but both factors may be involved In the mind of the child, figures and fingers are closely associated and knowledge of the fingers develops rather slowly Orton's (1934) studies on congenital word-blindness and strephosymbolia have shown that the question of right and left is involved Such patients are unable to distinguish between reading from left to right and from right to left They confuse p and q, *b and d, and so on and cannot separate "dog" from* "god" Orton referred to "hemispheric rivalry" as the major factor

The phenomenon of the phantom limb is a well-known *example of disorder of the body scheme* The phantom is often painful and on this ground alone thalamic activity may be suspected The phenomenon may arise as a result not only of amputation but also of interference with its nerve-supply either peripherally or within the spinal cord (Mayer-Gross 1929) Schilder has recorded a case in which, after amputation of the two distal phalanges of the 3rd and 4th fingers of the left hand there were two distinct phenomena first the presence of the phantom phalanges, and secondly the forgetting of the defect Head (1920) described how a phantom limb disappeared from consciousness following a stroke The lesion which reduced postural impressions also destroyed the phantom One of Betlheim's (1926) patients thought that his phantom limb was being preserved somewhere for him and would be restored to him eventually Such observations bring the phenomenon of the phantom limb closer to that of imperception of hemiplegia and of the left limbs

SUMMARY AND CONCLUSIONS

Two cases are described which illustrate disturbances of the body scheme In the first, there was unawareness of left hemiplegia with alloæsthesia, hypoæsthesia delusions about the left side of the body and Korsakow's psychosis These symptoms arose in a patient with chronic bleeding from a congenital intracranial aneurysm It was surmised that the aneurysm, which may have been situated on the right middle cerebral artery, had ruptured into the right parieto-thalamic region In the second case there was a congenital defect consisting of confusion between right and left, alexia, finger agnosia, agraphia and possibly acalculia The defects probably arose as a result of agenesis in the left parieto-occipital region

It is apparent that the human mind is accustomed to function in a complete body As a result of lesions at different levels of the nervous system the image of the body as it appears to the mind may be distorted or partially destroyed The right cerebral hemisphere is "inferior" to the left in that when diseased it does not lead to disorientation for right and left, and affects only the opposite side in the body scheme

The fact that a localised lesion of the brain can alter the mind's image of the human body presents us with an unusual opportunity for observations on the relationship between mind and body War-time injuries of the brain should provide suitable material for such a study

I wish to thank the Director General of the Army Medical Services for permission to publish this paper

REFERENCES

Alajouanine, T, Thurel, R, Ombredane, A (1934) *Rev neurol* 1, 695
Anton, G (1899) *Wien klin Wschr* 12, 1193
— (1900) *Arch Psychiat* 32, 86
Babinski, J (1914) *Rev neurol Nervenkr* 22, 845
— (1918) *Ibid*, 25, 365
Barkman A (1925) *Acta med scand* 52 213
Betlheim, S (1926) *Dtsch Z Nervenheill* 90, 271
Gerstmann, J (1924) *Wien klin Wschr* 37 1010
von Hagen K and Ives, E (1937) *Bull Los Angeles neurol Soc* 2, 95
Head, H (1926) Aphasia and Kindred Disorders of Speech, London vol i pp 77 and 257
— (1920) Studies in Neurology, London, vol ii, p 604
— and Holmes, G (1911) *Brain* 34 102
Herrmann, G and Potzl, O (1926) Ueber die Agraphie und ihre lokaldiagnostischen Beziehungen, Berlin
Ives and Nielsen J M (1937) *Bull Los Angeles neurol Soc* 2, 120
Jackson, J H (1889) Selected Writings of John Hughlings Jackson, London vol ii, pp 129, 143, 145 and 148
Koch, J and von Stockert, F G (1935) *Klin Wschr* 14, 746
Lange, J (1930) *Mschr Psychiat* 76, 129
Marburg, O (1931) *Arb neurol Inst Univ Wien* 33, 1
von Monakow, C (1885) *Arch Psychiat Nervenkr* 16, 151 and 317
Mayer Gross, W (1929) *Nervenarzt* 2, 65
— (1935) *Proc R Soc Med* 28 66
Muncie, W (1935) *Bull Johns Hopk Hosp*, 57, 330
Nielsen, (1938) *Arch Neurol Psychiat Chicago*, 39, 536
Orton, S T (1934) Some Studies in the Language Function—Localisation of Function in the Cerebral Cortex, Baltimore
Pick, A (1898) Pathologische Anatomie des Central nervensystems mit Bemerkungen zur normalen Anatomie desselben, Berlin p 169
Potzl, O (1924) *Z ges Neurol Psychiat* 93 117
Schilder, P (1935) The Image and Appearance of the Human Body London
von Stockert, F G (1934) *Mschr Psychiat Neurol* 88, 121

AGNOSIA OF HEMIPLEGIA AND OF BLINDNESS
AFTER CEREBRAL EMBOLISM

F PARKES WEBER, M D CAMB, F R C P
PHYSICIAN TO THE GERMAN HOSPITAL, LONDON

A WELL-BUILT man, aged 52, came under my observation in November, 1939, with signs of subacute or chronic bacterial endocarditis (endocarditis lenta), which was probably already of about a year's duration On March 16, 1939, he had had a severe cerebral stroke with coma and right hemiplegia lasting a few days, but with aphasia, alexia and agraphia of much longer duration In fact in November, though the hemiplegia had cleared up, he still had a trace of aphasia and was diligently learning to read and write again On Aug 1, 1940, he had another and severer attack of coma, this time with left, hemiplegia—evidently due to right-sided cerebral embolism, just as the previous attack had been due to left-sided cerebral embolism. In the course of many days he slowly recovered from the coma, but the paralysis of the left limbs persisted, together with the complete blindness, of cortical type, which accompanied it. He could not get about and lay in bed with his eyes and head directed to the right and was unaware of his blindness and of his hemiplegia, both of which he denied. However, after this last terrible stroke there was no sign of active bacterial endocarditis, though of course the loud mitral systolic murmur persisted. The last positive blood-culture for a *Streptococcus viridans* was on April 12, 1940. I have already described the case, as far as the bacterial endocarditis was concerned (Weber 1941). I shall deal here only with the neurological aspect of the case.

From February to April, 1941, he remained helpless, lying in bed with conjugate deviation of the eyes and head to the right—that is, towards the side of the more recent and more extensive cerebral damage. Complete spastic paralysis of the left upper and lower extremities. Very slight left facial paresis of cerebral type. Pupils large and equal, reacting slightly to light. He was completely blind in both eyes, though repeated ophthalmoscopic examinations (Dr Charles Markus) showed no changes in the fundi. Patellar and achilles reflexes active, more so on the left. Plantar reflex of normal flexor type on the right; doubtful on the left. Superficial abdominal reflexes not obtained.

Sensation, perception and intelligence.—He had complete anæsthesia of his left (paralysed) limbs, excepting that a tactile or painful stimulus to these limbs appeared sometimes to be referred to the trunk or to the right limbs (allæsthesia). On other parts of his body he could not always distinguish the position of a tactile stimulus (allachæsthesia); for instance, he confused stimuli on his ear, nose and hairy scalp. With his right hand (the left one was, as stated, quite anæsthetic) he could not in the least distinguish one object from another when holding and feeling it (bunch of keys; watch, coin, book, bottle), but he could detect a gross difference in weight. The astereognosia of objects held in his hand made one think of the want of recognition in cases of mind blindness and mind deafness. On one occasion he said that the sound of a watch was "like the sound of running water," but on another occasion he recognised the ticking of a watch when held to either ear. He could recognise the sound of metal being struck close to him. He could not always distinguish between the voices of those he knew. Nor could he always recognise the direction from which sounds came—there was often confusion of laterality. In regard to taste and smell he could distinguish eau de-Cologne when it was held to his nose, and a drop of cognac when placed on his tongue. Apparently he could distinguish fairly well the taste of ordinary foods and sweets, especially of chocolate, of which he was fond.

He was unaware of (did not perceive) his blindness and his hemiplegia, and denied them both (anosognosia, Anton-Redlich-Bonvicini syndrome). When asked to give his left hand he invariably gave his right hand. When I placed his right hand against his left (paralysed and anæsthetic) hand he did not recognise that it was his left hand till he was told; the left hand felt to him like any object which, owing to his astereognosia, he was unable to distinguish. Moreover, he often made mistakes between right and left, both in speech, when saying from which direction he thought a sound is coming, and in pointing with his right (unparalysed) hand. When asked how many fingers and toes he had he seemed to be calculating mentally and answered that he had 10 toes, but stopped at 9 fingers. Yet in regard to simple small arithmetical calculations there was no acalculia—he answered quickly that multiplying 8 by 3 makes 24, and similar reckonings were easy to him. In his business he had been good at figures and also at distinguishing colour shades; but an eye specialist, consulted after the first attack of cerebral embolism, said that perception of colour had been lost. As to his remembrance of colour he could not revisualise correctly; he told me that his hair was light and that he had blue eyes, whereas in reality his hair was dark and he had brown eyes. On the other hand, he said he preferred blue clothes which, according to his wife, he actually used to like. In regard to his memory generally, he was right (according to his wife) when he told me there were 5 rooms in his last home before coming to England. Apparently he could not always find the word he wanted but in conversation he could answer questions more readily than ask them, excepting, of course, when he asked for food or other necessaries. He talked preferably in German, his native language, but probably understood as much English as he had ever known. On one occasion he dictated sensible letters to his two children in America, but his condition varied. Sometimes there was disorientation in time and place. He had periods of restlessness and bodily pains, when he made a good deal of noise and sedatives were necessary; at such times especially there was sometimes incontinence. His appetite was as a rule remarkably good, almost a bulimia, as if his sense of satiety had been lost. The recurrent periods of pain—especially in the lower trunk and thighs, more on the left (hemiplegic) side—were I suspect connected with his cerebral damage, and so, probably were the periods of great restlessness. He died on April 28 during one of his periods of restlessness, at a home to which he had been removed on Feb 28. Towards the end he lost much weight in spite of continued good appetite.

There was no autopsy, but his cerebral symptoms must have been due to large destructive lesions on both sides of the brain caused by embolisms from his endocarditis lenta. That in the left (dominant) hemisphere probably included part of the optic thalamus and the radiating connexion with the occipital cortex; that in the right (minor) hemisphere probably involved the optic thalamus and included the radiations to the occipital and part of the parietal lobe cortex. The lesion in the minor hemisphere doubtless gave rise to the remarkable Anton-Redlich-Bonvicini syndrome—the imperception or agnosia of his blindness and left hemiplegia. The cerebral stroke of March, 1939, was probably due to embolism of the posterior cerebral artery of the left (dominant) hemisphere, while in the attack of August, 1940, there was doubtless embolic obstruction in the right posterior cerebral artery, but the resulting cerebral necrosis seems to have been more extensive.

DISCUSSION

Imperception or agnosia of the signs of grave organic cerebral disease—hemiplegia or cerebral cortical blindness or deafness—has not often been described in England. Anton (1889) was the pioneer observer of this class of case. He reported 3 cases of imperception of blindness or deafness of cerebral cortical type. His views were criticised by Redlich and Bonvicini (1908 and 1911), who described cases of their own. Babinski (1923) introduced the term "anosognosia." Barkman (1925) summed up the literature and noted that up to 1925 in every case of agnosia of hemiplegia the hemiplegia had been on the left side—that is to say, it was produced by a lesion of the right (presumably minor) cerebral hemisphere—but Schilder (1935) narrated the case of a woman, aged 48, with severe right hemiplegia and imperception of it. In that patient the dominant hemisphere was presumably the right one and the left was the minor one.

Among striking cases in which the neurological symptoms more or less resembled those in my present case are some recorded by Kramer (1915), Pötzl (1924), Von Hagen and Ives (1939), and Nielsen and Sult (1939), in whose fifth case the neurological picture was in many respects identical with that of my present case.

Their patient, a man aged 52, had developed left hemiplegia suddenly 5 years previously, and complete blindness had followed a cerebral stroke on the day before admission. On feeling his left hand with his right he had the illusion that the left belonged to someone else. He had agnosia of his left side unless his attention was specially called to it. Asked to place his right hand on his left ear he placed it on the right one. Asked to place his left hand anywhere he used his right one. Asked how many ears, eyes feet or hands he had, he always said "one." Asked how many fingers or toes he had he counted to ten and then answered "twelve." He consistently denied his blindness and claimed that he could see everything. In broad daylight he thought it was night. He could not revisualise correctly. He could not recognise objects when placed in his hands. He was always hungry (like my patient). Touch or pin prick was more often referred to the other side than to the correct one. He was a Mexican and could converse intelligently in Spanish; what he had known of English was still familiar to him. There was no autopsy, but a diagnosis of thrombosis of both posterior cerebral arteries was made.

Von Hagen and Ives (1937 and 1939), who have obtained autopsies in some cases of agnosia of left hemiplegia, say that Barkman (1925) thought that involvement of the right optic thalamus was necessary for the production of the anosognosia, but from their own observations they conclude that anosognosia is was no difficulty in recognising or naming objects He could write from copy but only very slowly to dictation and with many spelling mistakes Words were often spelled phonetically and mistakes were not recognised He could tell the time, set the hands of a clock correctly and match and identify colours When asked to read he spelled out each word slowly, tried to pronounce it, and then, if it sounded familiar to him, would proceed to the next word It was apparent that he had difficulty in identifying letters and that only by appealing to his auditory memory could he read Letters such as b, p, q i, d, g, h, m, n, v and w were repeatedly confused

Acalculia was to be expected in view of his lack of training and of his difficulty in identifying letters and numbers He could not distinguish the multiplication sign from the sign of addition, and division sign was meaningless The subtraction sign was recognised and understood, but nevertheless he could not subtract correctly in many instances Apart from the difficulty in deciphering symbols he made many mistakes in simple arithmetic

DISCUSSION

In the two disorders of the body scheme described the symptoms and signs seem to depend not only on the location of the lesion within the brain but also on the side of the brain affected In the case of a lesion in the right thalamoparietal region, there may be unawareness of left hemiplegia, periodic forgetting of the left arm or leg, or a disappearance of the left side of the body from consciousness The patient may deny that his left arm or leg belongs to him Disturbances of sensibility of a cortical type are usually present in the affected limbs and hallucinations of sensation, with transference (alloæsthesia) to the normal side, may appear In the second type of case a lesion in the left parieto-occipital area leads to disturbance on both sides of the body Confusion between right and left and finger agnosia appear, while there may sometimes be agraphia and acalculia Hughlings Jackson (1889), writing on the nature of the duality of the brain thought that there were greater mental defects, of a sensory kind, in left hemiplegia and that the lesion responsible was in the thalamus Head (1920, 1926) found that, in all forms of aphasia and amnesia, tests involving the appreciation of right and left were always poorly performed Tests for right and left in the mirror, however, were usually well done, except in those groups he described as having a semantic defect The lesion in such cases lay in the neighbourhood of the left supramarginal gyrus (parieto-occipital area) Schilder (1935) suggested that imperception on the left side of the body occurs more frequently than on the right because it is really an exaggeration of a normal tendency "A focal lesion added to this tendency will provoke the picture of imperception of the left side"

Why the fingers should be more susceptible to disorder in the body scheme is not understood The coincidence of finger agnosia acalculia and agraphia may result from proximity of cerebral localisation or because there is some deep similarity between them, but both factors may be involved In the mind of the child, figures and fingers are closely associated and knowledge of the fingers develops rather slowly Orton's (1934) studies on congenital word-blindness and strephosymbolia have shown that the question of right and left is involved Such patients are unable to distinguish between reading from left to right and from right to left They confuse p and q, b and d, and so on and cannot separate "dog" from "god" Orton referred to "hemispheric rivalry" as the major factor

The phenomenon of the phantom limb is a well-known example of disorder of the body scheme The phantom is often painful and on this ground alone thalamic activity may be suspected The phenomenon may arise as a result not only of amputation but also of interference with its nerve-supply either peripherally or within the spinal cord (Mayer-Gross 1929) Schilder has recorded a case in which, after amputation of the two distal phalanges of the 3rd and 4th fingers of the left hand there were two distinct phenomena first the presence of the phantom phalanges, and secondly the forgetting of the defect Head (1920) described how a phantom limb disappeared from consciousness following a stroke The lesion which reduced postural impressions also destroyed the phantom One of Betlheim's (1926) patients thought that his phantom limb was being preserved somewhere for him and would be restored to him eventually Such observations bring the phenomenon of the phantom limb closer to that of imperception of hemiplegia and of the left limbs

SUMMARY AND CONCLUSIONS

Two cases are described which illustrate disturbances of the body scheme In the first, there was unawareness of left hemiplegia with alloæsthesia, hypoæsthesia delusions about the left side of the body and Korsakow's psychosis These symptoms arose in a patient with chronic bleeding from a congenital intracranial aneurysm It was surmised that the aneurysm, which may have been situated on the right middle cerebral artery, had ruptured into the right parieto-thalamic region In the second case there was a congenital defect consisting of confusion between right and left, alexia, finger agnosia, agraphia and possibly acalculia The defects probably arose as a result of agenesis in the left parieto-occipital region

It is apparent that the human mind is accustomed to function in a complete body As a result of lesions at different levels of the nervous system the image of the body as it appears to the mind may be distorted or partially destroyed The right cerebral hemisphere is "inferior" to the left in that when diseased it does not lead to disorientation for right and left, and affects only the opposite side in the body scheme

The fact that a localised lesion of the brain can alter the mind's image of the human body presents us with an unusual opportunity for observations on the relationship between mind and body War-time injuries of the brain should provide suitable material for such a study

I wish to thank the Director General of the Army Medical Services for permission to publish this paper

REFERENCES

Alajouanine, T Thurel, R , Ombredane, A (1934) *Rev neurol* 1, 69
Anton, G (1899) *Wien klin Wschr* 12, 1193
— (1900) *Arch Psychiat* 32, 86
Babinski, J (1914) *Rev neurol Nervenkr* 22, 845
— (1918) *Ibid*, 25 365
Barkman A (1925) *Acta med scand* 52 213
Betlheim, S (1926) *Dtsch Z Nervenheill* 90, 271
Gerstmann, J (1924) *Wien klin Wschr* 37, 1010
von Hagen K and Ives, E (1937) *Bull Los Angeles neurol Soc* 2 9
Head, H (1926) Aphasia and Kindred Disorders of Speech, London, vol i pp 77 and 257
— (1920) Studies in Neurology, London, vol ii, p 604
— and Holmes, G (1911) *Brain*, 34, 102
Herrmann, G and Potzl O (1926) Ueber die Agraphie und ihre lokaldiagnostischen Beziehungen, Berlin
Ives and Nielsen J M (1937) *Bull Los Angeles neurol Soc* 2 1
Jackson, J H (1889) Selected Writings of John Hughlings Jackson, London vol ii, pp 129, 143, 145 and 148
Koch, J and von Stockert, F G (1935) *Klin Wschr* 14, 746
Lange, J (1930) *Mschr Psychiat* 76, 129
Marburg, O (1931) *Arb neurol Inst Univ Wien* 33 1
von Monakow C (1885) *Arch Psychiat Nervenkr* 16, 151 and 317
Mayer Gross, W (1929) *Nervenarzt* 2, 65
— (1935) *Proc R Soc Med* 28 66
Muncie, W. (1935) *Bull Johns Hopk Hosp* , 57, 330
Nielsen, (1938) *Arch Neurol Psychiat Chicago*, 39, 536
Orton, S T (1934) Some Studies in the Language Function—Localisation of Function in the Cerebral Cortex, Baltimore
Pick, A (1898) Pathologische Anatomie des Centralnervensystems mit Bemerkungen zur normalen Anatomie desselben, Berlin p 169
Potzl O (1924) *Z ges Neurol Psychiat* 93, 117
Schilder, P (1935) The Image and Appearance of the Human Body, London
von Stockert, F G (1934) *Mschr Psychiat Neurol* 88, 121

AGNOSIA OF HEMIPLEGIA AND OF BLINDNESS

AFTER CEREBRAL EMBOLISM

F Parkes Weber M D CAMB , F R C P
PHYSICIAN TO THE GERMAN HOSPITAL, LONDON

A WELL-BUILT man, aged 52, came under my observation in November, 1939, with signs of subacute or chronic bacterial endocarditis (endocarditis lenta), which was probably already of about a year's duration On March 16, 1939, he had had a severe cerebral stroke with coma and right hemiplegia lasting a few days, but with aphasia, alexia and agraphia of much longer duration In fact in November, though the hemiplegia had cleared up, he still had a trace of aphasia and was diligently learning to read and write again On Aug 1 1940, he had another and severer attack of coma, this time with left hemiplegia—evidently due to right-sided cerebral

THE LANCET

LONDON SATURDAY JANUARY 10 1942

STARVING-OUT BACTERIA

To cure disease by starving the pathogen is an attractive suggestion which was expressed shortly after the microbial nature of many ailments became known A banting regimen was proposed for the invading organism, but who would have pictured it in the situation in which a sulphanilamide-treated streptococcus is now conceived : surrounded by substances essential for its growth, but of which it cannot make use ? Suggestions that therapeutic agents affect processes of nutrition in the organisms which they inhibit date at least from the time of **EHRLICH**, but their exact demonstration is recent Several workers showed that media suitable for growth of streptococci were rendered unsuitable by sulphanilamide but that the organism could again grow on further addition of natural extracts to the sulphanilamide-containing media Good presumptive evidence was given by **WOODS**[1] that the active material in these extracts was *p*-aminobenzoic acid and this has been confirmed by **RUBBO** and **GILLESPIE**[2] whose paper appears on another page The only action of sulphanilamide under these conditions is to make the organism nutritionally more exacting for *p*-aminobenzoic acid is demonstrably not needed for the normal growth of streptococci. **FILDES**[3] was however able to suggest · analogy with work on other bacterial nutrients at *p*-aminobenzoic acid was probably an essential bstance for at least all organisms susceptible to lphanilamide inhibition, but that it need not be pplied preformed because most organisms themlves synthesised it **RUBBO** and **GILLESPIE** support iese conceptions by their demonstration that ·aminobenzoic acid is necessary for growth of *lostridium acetobutylicum* (W) which in its normal :owth thus suffers from a disability induced in other ganisms by sulphanilamide

A point stressed by these workers is the quantitative iscrepancy between the interacting quantities of -aminobenzoic acid and sulphanilamide which are onsistently in the ratio of about 1 : 25 000 Immediate hemical reaction is thus unlikely, and **WOODS** iterprets his results in terms of an enzyme which ses *p*-aminobenzoic acid Sulphanilamide inhibits he enzyme because it is similar enough in structure o attach itself to the points at which *p*-aminobenzoic cid must be linked for normal activity and rowth But the enzyme has much greater affinity or its normal substrate, *p*-aminobenzoic acid and a ery large excess of sulphanilamide is necessary to isplace this from the enzyme Since most tissues nd effusions contain *p*-aminobenzoic acid the large mounts of sulphanilamide therapeutically necessary an be understood Deleterious effects of sulphanilamide on the patient are explained by the tissues not nly containing but needing *p*-aminobenzoic acid

Discovery of new chemotherapeutic agents is still largely made by empirical methods Practised chemotherapists will shrug when asked why they made particular compounds It is usually by flexible analogies with previously successful agents or other natural compounds or simply by the preparation of all available substances of a given type As was indicated by **FILDES**, and has now been brought out by **RUBBO** and **GILLESPIE**, the structural similarity between the essential substance *p*-aminobenzoic acid and the inhibiting agent sulphanilamide presents a new type of guide to the synthesis of chemotherapeuticals The suggestion that compounds similarly related to known essential substances should be prepared has yielded several new inhibitory compounds For its further development this suggestion requires that other known inhibitory substances be investigated nutritionally in order to provide further models of this type No chemotherapeutic millennium is at hand—not all inhibitory compounds act as does sulphanilamide nor are all inhibitory compounds therapeutic agents—but one new and more rational method has been added to those already available in chemotherapeutic research

COLD FEET

COLD is now playing a more decisive part in warfare than at any time since 1812 and the treatment of its effects is agitating the minds of medical men on both sides The German armies in Russia poorly equipped for an intensive winter campaign and with their medical services disorganised are gaining all the experience of frost-bite which we could wish and the amount of disability which will ultimately result from this experience must be enormous Our own forces on land are not yet being exposed to the effects of extreme cold on the same scale but smaller numbers of the Royal Air Force have already been subjected to analogous conditions throughout two winters while engaged in long flights high up over sea or continent. But the surface of the body is by nature highly immune to dry cold and live skin in what is called super-cooling can be brought to a temperature 5, 10 or even 15 degrees below the freezing-point of water without actually congealing Like a supersaturated solution it requires a crystal to initiate the change from fluid to solid. In this war we have not seen much of the effects of prolonged exposure to lesser cold such as produced 3000 cases of trench foot’ in our First Army between December 1914, and February 1915 This condition as was recognised in the Crimean War, can arise even when the temperature is above freezing point—alternating frost thaw and rain is the ideal weather for its production It is seen when men have to spend long periods standing or crouching in waterlogged trenches with no facilities for lying down when off duty. Additional factors are long rapid marches preceding these periods ill-fitting boots and lack of provision for frequent changes of socks and footgear We have however seen something of two closely allied conditions— immersion foot and shelter foot’ Immersion foot is seen for example in those bomber crews who are forced down on the sea and spend hours or days sitting in a rubber dinghy with their feet awash. Shelter foot was one of the trials of those modern troglodytes more particularly

---

1 Woods D D *Brit J exp Path.* 1940 21 74
2 See also *Nature Lond.* 1940 146 838
3 Fildes P *Lancet* 1940 i 955

evidence of a lesion involving the thalamus in the minor hemisphere or situated in the immediate vicinity so as to separate the thalamus from the cortex of the frontal, parietal and temporal lobes

In most typical cases there is also left homonymous hemianopia and tendency to conjugate deviation of the eyes and head to the right, there is also more or less sensory impairment on the left (paralysed) side Schilder (1935), Nielsen and Sult (1939) and others discuss the occasional association of allochiria (allæsthesia) and allachæsthesia in such cases Schilder in discussing a case recorded by Kramer remarks that it is at least probable that the same mechanism which prevents the patient from appreciating his hemiplegia and the left side of his body is also responsible for the transfer of the sensation from one side of the body to the other

It is noteworthy that a cerebral agnosia-lesion may cause not only some kind of imperception in an actual limb but also in a phantom limb Thus, Schilder quotes from Head

> "One of our patients had lost his left leg some time before the appearance of the cerebral lesion which destroyed the power of recognising posture After the amputation, as in so many similar cases, he experienced movements in a phantom foot and leg But these ceased immediately on the occurrence of the cerebral lesion, the stroke which abolished all recognition of posture destroyed at the same time the phantom limb"

It seems probable that my patient's complete blindness of cerebral cortical type was due to double homonymous hemianopia, as suggested to me by Dr Russell Brain The attack of left cerebral embolism in March, 1939, probably caused right homonymous hemianopia which was not detected till the right cerebral embolism of August, 1940, produced left homonymous hemianopia and thus complete blindness I think that in the fifth case of Nielsen and Sult (1939), to which I have already referred, a similar explanation must hold good for the complete blindness which followed the second cerebral stroke but in their case the left hemiplegia accompanied the first stroke (not the second as it did in my case)

Absolute imperception of visual stimuli (complete cortical blindness) as a result of bilateral damage to the occipital lobes is rare In the remarkable case described by Byrom Bramwell and his colleagues (1915) there was retention of macular as distinct from panoramic vision

> A man died of pneumonia at the age of 71 years, 26½ years after an attack diagnosed as acute nephritis, during which he suddenly lost his eyesight and had a series of epileptiform fits He was unconscious for 14 days, and it was 3 weeks before he could recognise voices When he regained consciousness he was quite blind, but afterwards his central vision was gradually in some degree restored The fundi of the eyes appeared normal, there was neither mind blindness nor word-blindness During the remaining 26½ years of his life there were no fresh head symptoms and practically no change in vision, no motor paralysis, no loss of sensation, no sensory or motor aphasia A large lesion was found in each occipital lobe at the autopsy

In regard to the retention of macular vision Carmichael's case (1930) may also be noted

> This was a boy aged 14, in whom Geoffrey Jefferson had performed a right occipital lobectomy After recovery from the operation the patient had left homonymous hemianopia with sparing of the macular region Four months later there was an attack of meningitis and the macular region was found also involved, the hemianopic boundary line "splitting the macula" (passing through the centre of the macular region)

Some of the pains often complained of by my patient were doubtless connected with his cerebral damage and so probably were his periods of restlessness Discussions on the thalamic syndrome have thrown much light on this subject

SUMMARY

In a man of 52 bilateral cerebral embolisms occurred as a result of endocarditis lenta and gave rise to permanent left hemiplegia and complete blindness of cerebral cortical type The patient was unaware and refused to admit the existence of his blindness as well as of his left hemiplegia—the Anton-Redlich-Bonvicini syndrome

I wish to thank Dr W Russell Brain, Dr Charles Markus, Dr H K Lauber, Dr K Blum, and Dr Harry Shaw

Continued at foot of next column

Reviews of Books

Cancer of the Face and Mouth

Diagnosis, Treatment, Surgical Repair VILRAY P BLAIR MD, SHERWOOD MOORE, MD LOUIS T BYARS, MD London Henry Kimpton Pp 599 50*s*

IT is artificial, but clinically convenient, to group together in a book those forms of squamous celled carcinoma occurring above the clavicle, with the exception of carcinoma of the larynx This volume written by three distinguished American authors, gives details of the treatment and results in a great variety of malignant conditions—including carcinoma of the face, ear nose, orbit lip tongue salivary glands, floor of the mouth pharynx, cheek, alveolar process, palate and velum, nasopharynx and antrum—and in moles, nævi melanomas, dentigerous cysts and adamantinomas, as well as secondary disease in the lymphatic glands of the neck The book is not overloaded with figures, but there is a statistical chapter at the end of the text written by Dr E L Keyes and based on 780 private cases treated by the late Ellis Fischel, it includes only five year follow-up figures for microscopically proved disease, so that the material is of high quality In the rest of the text the authors illustrate their general remarks by numerous photographs and with details of individual patients This method demands close attention from the reader, but is more valuable than any attempt to derive rules of thumb from massed statistics where circumstances are so various The authors insist that technique must be elastic They use surgery perhaps more freely than workers in this country, where radiology has to a large extent superseded it, but their records include many advanced cases, which could only be treated by extensive surgery, supplemented by radiology, diathermy, the soldering-iron cautery, and even occasionally a "cancer paste" These big operations were followed by plastic repair of the face (illustrated in 64 plates), which was also regarded as part of the work of a team treating cancer The work of Butlin on the tongue is repeatedly and appreciatively mentioned The authors do not believe that radiology can deal effectively with secondary disease in lymph glands, either prophylactically or when the disease has declared itself, they prefer to perform block dissections of the neck and have not experienced an unduly high post-operative mortality, even in elderly patients

Handbook of Medical Jurisprudence and Toxicology

(8th ed) WILLIAM A BREND, MD Camb London Charles Griffin and Co Pp 329 10*s* 6*d*

THIS edition differs from its predecessors only in the introduction of new chapters on mental disorders and on the giving of medical evidence Dr Brend is chiefly concerned with civil proceedings and the assessment of medical evidence of the kind given in the special courts in which such hearings take place. He tells us less of the experiences of the pathologist, the police surgeon and the general practitioner, though he deals carefully with them A chapter on pregnancy and legitimacy—which also covers paternity and forensic blood-grouping—is followed by sections of about half as long on criminal abortion and infanticide, whereas these are of more everyday occurrence One reason why this book has become so justly popular is its success in presenting briefly and accurately all the broad facts and smaller details of toxicology

---

DR PARKES WEBER REFERENCES

Anton G (1899) *Arch Psychiat Nervenkr* 32 86
Babinski J (1923) *Rev Neurol* 30 731
Barkman A (1925) *Acta med scand* 62 235
Bramwell, B Bolton J S and Robinson W (1915) *Brain*, 38, 44
Carmichael E A (1930) *Proc R Soc Med* 30 853
Kramer, F (1915) *Z ges Neurol Psychiat (Referate)* 11 377
Nielsen J M and Sult C W (1939) *Bull Los Angeles Neurol Soc* 4, 69
Potzl O (1924) *Z ges Neurol Psychiat (Originalien)* 93 117
— and Redlich, E (1911) *Wien klin Wschr* 24 517
Redlich and Bonvicini G (1908) Ueber das Fehlen der Wahrnehmung der eigenen Blindheit bei Hirnkrankheiten Leipzig
Schilder P (1935) The Image and Appearance of the Human Body London pp 12 and 309
Von Hagen, K O and Ives E R (1937) *Bull Los Angeles Neurol Soc* 2 95, (1939) *Ibid* 4, 41
Weber F Parkes (1931) *Brit J Child Dis* 28 14 (1941) *Lancet* i 630 and 707

teers have given amounts of blood varying between 700 and 1200 c cm This first caused some quickening of the pulse which later slowed with the onset of symptoms of shock and actual fainting A psychic factor could not be excluded and was probably important Yet the collapse at the close of or shortly after the bleeding suggests that emotional reactions were secondary, and that the chief factor was circulatory disturbance Typical signs of shock were recorded, including profuse sweating which tended further to decrease blood-volume and to augment the symptoms If donors were reclining faintness usually disappeared in a couple of hours but was very liable to reappear if they got up Blood-pressure recovered more slowly, the fall sometimes enduring for many hours The restoration of blood-volume was slow, usually taking about three days to be complete It was accomplished by the appearance of new plasma in the circulation equal in volume to the sum of plasma plus red cells removed by bleeding, the replacement of red cells occurring at an even later date and presumably being accompanied by an equivalent fall in the volume of total plasma During the first hour or so after the bleeding there is comparatively little replacement of fluid, thus if about 1000 c cm blood is removed compensatory replacement of plasma amounts to only 200 c cm Hæmoglobin and plasma protein fall, showing that dilution by a protein-poor fluid has occurred Plasma volume subsequently increases pari passu with a rise in the concentration of plasma protein to normal during two or three days The inference is that fluid can only be retained if protein is produced to hold it in the circulation uch compensatory plasma protein is not held in nmediate reserve but its appearance follows he physiological stimulus of decreased plasma volume In support of this view it is observed hat the administration of saline usually results in a very transient increase in blood-volume, and the fluid is soon excreted and largely disappears rom the circulation According to WALLACE and SHARPEY-SCHAFER[5] initial dilution of blood shortly after hæmorrhage is slight, and they agree with EBERT, STEAD and GIBSON[6] in finding that the maximum fall of hæmoglobin due to dilution may take from one to three days Both papers record cases of over-compensation where dilution was apparently in excess of the blood removed EBERT and his co-workers remark, however, that all methods of estimating blood-volume are subject to limitations, they depend on the ratio of plasma to cells, which differs in large and small vessels

Compensation after severe hæmorrhage is considered to take place as follows Contraction of peripheral vessels in less important organs restricts the circulatory blood to vital centres Reduction of oxyhæmoglobin by the tissues is much more complete than normal and the exchange of oxygen and especially carbon dioxide in the lungs is enhanced by hyperpœna Dilution of the blood with protein-poor fluid, followed by the formation and passage of new-formed plasma into the blood-stream; restores the head of pressure in the vessels Finally, erythrocytes are regenerated and the oxygen carriage is restored to normal EBERT and his co-workers report that, in contrast with the findings in dogs, severe hæmorrhage in man calls forth neither contraction of the spleen nor the passage of large amounts of reservoir blood into the active circulation These various investigations all reaffirm the necessity for early and thorough treatment of shock When hæmorrhage is the chief factor blood-transfusion is the first choice, with the administration of plasma or serum a good second In severe cases the administration of oxygen through some efficient apparatus may help

MIDWIVES AND THEIR COLLEGE

A WOMAN who assists others in childbirth (OED definition) has this advantage over her *fellow* assistants that she works in a protected area and is herself protected from unqualified competition Anyone can call herself a nurse and attend on sick folk whether she has qualified or not for the Nurses Register, the midwife, unless her name appears on the Roll of Midwives, is not a midwife at all, but a miscreant The roll was established in 1903 being a list of women certified by a central board (C M B) under the Midwives Act 1902, but uncertified women were not prohibited from practice until nearly 7 years later It was during this period that it was *useful to* distinguish between a midwife and a certified midwife Now there is no need "Sudden or urgent necessity" is the reasonable and only legal excuse for amateur midwifery[1] The designation 'State Certified Midwife' dates only from 1934, and was introduced to improve the title and assist the status of midwives Then for the first time, at the instance of the Midwives Institute, an abbreviation was officially allowed and the honourable letters 'S C M" along with the honourable badge replaced the curious habit which had grown up of saying 'I have taken the C M B This coincided with another symbolic event when the Midwives Institute, founded in 1881 and incorporated in 1889, came into possession of a house at 57, Belgrave Street, worthy of its status and activities, justifying the change of name to "College of Midwives" announced at a luncheon on Dec 11 1941 Had PETER CHAMBERLEN (of forceps fame) had his way this college would have come into being 225 years earlier, but, as Prof MUNRO KERR has reminded us CHAMBERLEN was prosecuted for unqualified practice —he was son of a Paris surgeon and a Protestant refugee—and our midwifery practice took the wrong *turning* *At this same festive occasion* the Minister of Health told of the steps he had taken to ensure the right of midwives to have a voice in determining a scale of salaries For in the workaday world vocation status and salary are a triplet with a common placenta Midwives, it is clear, do not want to be regarded as a part of nursing, but as an independent branch of the profession The Midwives Institute have put it this way 'A midwife possesses certain rights, privileges and obligations which are conferred upon her by law Her title *and sphere of* work are protected and if she elects to practise she is an independent practitioner Her status is on a different plane from that of a nurse" The corollary is that they must provide a training at least as good as that of nurses in this country and of midwives in other countries

---

Data for the official Medical History of the War should be sent to the editor-in chief, Sir Arthur MacNalty Room 208, Caxton House West, Tothill Street London S W 1 the elderly and obese, who spent their nights sitting with legs unsupported, often with the pressure of a deck-chair's cross-bar further impeding the circulation, with the coming of bunks it disappeared

---

[1] *See* L Farrer Brown. Habitually and for Gain *Lancet* 1941 ii, 548

Raymond Greene,[1] who had experience of the effects of cold on the extremities as medical officer to the Himalaya expeditions of 1931 and 1933, has lately discussed their prevention and treatment Prevention, he points out, involves not only preventing chilling but also guarding against damp, circulatory stagnation from mechanical causes, anoxia, trauma and nutritional deficiency The incidence of trench foot fell rapidly in the last war with the institution of foot-drill, with careful attention to drying of socks, boots and gum-boots, and draining of trenches Systematic inunction of whale-oil was also found of great service, and the provision of whale-oil in rubber dinghies might help to prevent immersion foot In our aircraft preventive measures—attention to details of clothing, and in the larger machines warming the interior by using the exhaust gases—have proved highly effective The layman s traditional treatment for frost-bitten extremities has been cold friction rather than warmth " Rub the part with snow " is an arresting paradox which sticks in the memory, and until lately this would have been the advice of most medical men whose experience of clinical frost-bite is usually nil **Greene** labels this practice extremely dangerous When foot or hand goes numb he would at once apply warmth, but never greater than body heat, and would never apply friction If the circulation still does not return he would dry and wrap up the affected limb and give it absolute rest, warming the patient himself with hot drinks and adequate clothing, but forbidding the excessive warmth of a hot cradle Heat, he maintains, will increase the metabolism of a part already endangered from anoxia, so that the frostbitten part should be kept neither hot nor cold but cool During trench warfare tetanus sometimes originated from infection of an insignificant blister associated with trench foot, so that antitetanic serum should be given In the last war many men had their frostbitten limbs amputated as an emergency measure—some even in hospital train or hospital ship on the way home—but it came to be realised, as **Grattan** brings out in his chapter in the official history,[2] that however alarming the limb may look it is never right to amputate at once Spreading sepsis may require early amputation, but where the gangrene is dry, as it usually is, a line of demarcation should be awaited This need for conservatism is the main lesson that emerges from **Greene**'s paper, and he gives an example to show that even when the feet are black and hard to above the ankle the patient may escape with the loss of no more than a few phalanges At the conclusion of three Holme lectures[3] on the effects of cold upon skin **Sir Thomas Lewis** remarks that the reactions of the skin to heat and to frost are fundamentally similar The rational treatments of the lesions of frost-bite and scald therefore have much in common While fortunately we have little practical acquaintance with frost-bite, we should make full use of recent experience in treating similar lesions resulting from heat

---

[1] *Lancet* 1941, ii, 689

[2] Grattan H W History of the Great War Medical Services, Surgery, vol ii, p 176

[3] *Brit med J* 1941, ii, 795, 837, 869

SHOCK AND HÆMORRHAGE

According to **Harkins**,[1] the essential features of shock are the same whether it is due to hæmorrhage or to trauma He quotes **Blalock**, who alternately bled and transfused dogs in such a way that although more blood was ultimately reintroduced than had been removed their blood-pressure was kept low for several hours This consistently low blood-pressure was thought to be the cause of the state of shock which finally developed **Harkins** maintains that the primary factor in shock is oligæmia, whether arising from loss of blood in hæmorrhage or loss of plasma by exudation in a traumatised area In spite of constriction of the larger vessels the blood-pressure falls, tissue anoxæmia results and general loss of capillary tone with increased permeability may follow It is true that in all forms of shock the skin is pale and cold, while sweating, nausea and vomiting are present and the pulse is slow, but in shock due to hæmorrhage in dogs who had lost 25% of their blood capillary tone was maintained and permeability to water, salts, proteins and certain dyestuffs was preserved **Harkins** would explain this contrast with traumatic shock on the grounds that in simple hæmorrhage the sequence of events is so dramatic that the subject is either rapidly killed or else has his blood-pressure restored by energetic treatment He says too that hæmorrhage and trauma usually occur together and it is undesirable to distinguish between shock due to either cause But while severe trauma is usually accompanied by hæmorrhage the reverse is not true—minor war injuries may result in copious bleeding—and a clinical distinction is desirable Further, the evidence against a toxic factor in shock is far from complete In trauma there is often definite evidence of moderate or severe renal damage, in hæmorrhage deficient renal circulation causes a fall in the output of urine and a slight rise in the non-protein nitrogen of the blood, but death if it occurs results from general tissue anoxia at a time when damage to the kidney by local anoxia is still slight If at a late stage remedial measures are successful, recovery of renal function is rapid and complete[3] It is this greater tendency to recover with adequate treatment which distinguishes shock due to hæmorrhage and which makes recent studies on the subject of special interest **Schnedorf** and **Orr**[4] found that when dogs are bled their condition remains almost unaltered for a time, but later collapse occurs and its onset is sudden, rapid and severe, the arterial oxygen tension only falls slightly but the amount of oxygen in the venous blood is greatly decreased, and muscular movement associated with the hyperpnœa increases the oxygen want Although the decrease in arterial oxygen is small, **Schnedorf** and **Orr** found the administration of oxygen of value Most of their dogs died if more than 30% of the blood was removed rapidly, but those receiving oxygen tolerated a 15% greater loss before death, which took place in 3 6 hours as compared with 3 08 hours in untreated dogs

In man the findings are similar[5,6] Human volun not the first report of such cases Howard[6] described 5 similar ones, Edeiken and Wolferth[7] reported 14 patients with persistent shoulder pain following myocardial infarction, and Boas and Levy[8] 21 cases Spillane and White[9] in discussing atypical cardiac pain referred to both types of case—those with paroxysmal pain and those with chronic pain They considered the possibility of the chronic pain being a true referred pain, as it undoubtedly is in the paroxysmal type They recorded the development of herpes zoster[10] in anginal subjects and noted its relationship to the distribution of the referred pains The occurrence of herpes zoster over other painful viscera was recalled—in biliary and renal colic, in pleurisy, pericarditis, appendicitis and arthritis—and also the occurrence of other skin lesions along the tract of anginal pain Mackenzie observed a case in which the lesion took the form of a band of ecchymoses, six inches in length, along the arm Finally, Spillane and White quoted the 3 reported cases in which the pain of anginal attacks was replaced by paroxysms of homolateral sympathetic stimulation[11] In Gibson's case there was dilatation of the left pupil and in all 3 unilateral hyperidrosis of the face, neck, upper chest and arm Such reports seem to suggest that not only may referred cardiac pain be sometimes chronic and not paroxysmal but also that other, non-painful, phenomena may be of referred cardiac origin

---

[1] Harkins H N *Surgery* 1941, 9, 231

[2] Price P B Hanlon C R Longmire W P and Metcalf, W *Bull Johns Hopk Hosp* 1941 69 327

[3] Black, D A K *Lancet*, 1940, ii 618

[4] Schnedorf J G and Orr, T G *Surg Gynec Obstet* 1941, 73, 495

[5] Wallace, J and Sharpey Schafer, E P *Lancet* 1941, ii 393

[6] Ebert, R V Stead, E A and Gibson J G *Arch intern Med* 1941, 68, 578

VARICOSE ULCERATION OF THE LEG

Ratschow of Wittenberg[12] describes the local circulatory failure associated with varicose ulceration as taking place in three stages The first he terms "phlebektasia," a state in which the veins are lengthened and prominent but the muscular coat is hypertrophied and the valves show no histological change This condition is seen, for example, in the legs during pregnancy, and Ratschow believes it to be reversible To lead to ulceration the eins have to go through the two further stages of com- ensated and uncompensated varicosity In true aricosity there is atrophy of the muscle coat with econdary hyperplasia of the connective tissue, while he intima is thickened either diffusely or in patches he tendency is for the circulation at the periphery to be eversed, but in the less severe cases the embarrassment f the circulation is compensated When it is not, the ollateral veins become engorged, and backflow occurs nto the neighbouring capillaries and may even invade he capillaries on the arterial side The chemical change nduced by stagnation in the tissues produces spasm of he walls of the arterioles Local necrosis leading to lceration is said by Ratschow to be a direct effect of ascular failure due to this spasm His treatment of aricose ulcer is to put the patient to bed with the foot aised above the level of the knee, in order to arrest the welling as rapidly as possible He then gives doses of rtificial sunlight locally over 48–72 hours, and follows his by the local application of sex-hormones in the form of ointment (Progynon-B oleum and Cyren-A Salbe) The rationale of this treatment is not very clear, but seems to have some connexion with the local production of acetylcholine and its vasodilator effect, and Ratschow, at least, is fully convinced of its efficacy Obliteration of the veins and pressure bandaging are used in combination with these local measures, and the patients are also given injections of œstrin and testicular extracts The connexion between this hormone therapy and the healing of the ulcer is even more difficult to follow than the local effect Haase,[13] discussing the surgical aspects, reminds us that emboli are rather commoner after resection of veins than after injection treatment, and that this fact should be taken into consideration when deciding which to do In the presence of a positive Trendelenburg test he does not inject but uses ligature with partial resection, where there are numerous veins not obviously leading to one single trunk, he does multiple resections In some of the worst cases he adopts Nussbaum's plan of making a circular incision The incision is made through the thickened skin all round the ulcer and carried down as far as the fascia The wound gapes fairly widely, showing how tense the scar tissue round the ulcer has become The knife also divides many of the capillaries which have been engorged by the backflow from the varicose veins, and these are driven to finding a new outlet by way of the deep veins They usually succeed, with the result that the granulations within the circular incision soon become red and healthy, in contrast to the tissues outside, which retain the bluish colour typical of stagnation Once the ulcer is covered with healthy granulations it can be skin grafted Haase says that the immediate results are almost always good as long as the patient remains in bed, but relapse is common when he gets up

SALVAGE OF PAPER

"What I tell you three times is true"—*Lewis Carroll*

WE appeal for the third time to the 66,356 doctors whose names appear in the current Medical Directory to make a clean sweep of any idle paper in their possession At a modest estimate of 1 cwt a head this would contribute 3500 tons of paper towards all those munitions of war mentioned in last Sunday's broadcast In medicine, more than in any other profession, the dead wood of the past can safely be cut out and the future be left to the propagation of contemporary shoots For the most part our shelves carry the record of forgotten things which will have no meaning for our heirs and be only a burden to our executors Let all this paper be put into circulation again now It will at least help to ensure the freedom of thought without which the printed word has no value to such as us

ST LOUIS ENCEPHALITIS AND EQUINE ENCEPHALOMYELITIS

IF parasitic infections are classified according to what may be called their œcology (or shall we say the home life of the parasites?) it is seen that they are all variations, if not on a single, at least on but a few themes This is particularly true of virus diseases, many of which have as their leitmotiv the decrease or more commonly the increase in pathogenicity of the virus as a result of its transference from one species of animal to another Two interesting examples of this variation in pathogenicity with transference have come to light in connexion with St Louis encephalitis and equine encephalomyelitis, two diseases which though quite distinct immunologically are now seen to be closely related œcologically St Louis encephalitis was, as the name implies, first encountered in the neighbourhood of St Louis as well as in Kansas City and Paris (Illinois) in 1933 Equine encephalomyelitis was at first thought to be a disease of horses in North America till in 1937 both the eastern and the western forms of the disease were found to be causing a highly fatal encephalitis in human beings, especially children For the past few years in the states of Washington and Colorado encephalitis has occasionally been noted among human beings, but it was not till 1939 that in the Yakima Valley in Washington the cases were sufficiently numerous to constitute an epidemic While encephalitis was seen in men a few instances of encephalomyelitis also occurred among horses In 1940 encephalitis was again prevalent among men and horses both in Washington and in Colorado A study of these two outbreaks has shown that they were caused by two

---

[6] Howard T *Med J Rec* 1930, 131 364
[7] Edeiken, J and Wolferth, C C *Amer J med Sci* 1936 191, 201
[8] Boas E P and Levy H *Amer Heart J* 1937, 14 540
[9] Spillane J D and White, P D *British Heart J* 1940, 2, 123
[10] *Ibid* 1939, 1 291
[11] Gibson, A *Brain* 1905 28 197 Palmer R S *Amer Heart J* 1930 5, 519 Holt, E *Amer Heart J* 1930 5 522
[12] Ratschow M *Dtsch med Wschr* 1941 67, 503
, p 511

Annotations

A NEW BLOOD-GROUPING

We are now resigned to the fact that the four blood groups of Landsteiner are not the whole story of the individuality of the blood In addition to the classical groups A, B, AB and O, with their antigenic (agglutinogen) factors in the red blood-cells and corresponding opposite isoagglutinins, other important factors have been described The M and N factors were discovered by using immune sera prepared by injecting human blood-cells into rabbits, Landsteiner and Levine showed that all human beings can be grouped as M, N, or MN, and that these factors were inherited independently of the classical blood-groups This discovery, though genetically useful and applicable to paternity tests did not complicate the blood transfusion situation because these factors were agglutinogens only and no corresponding agglutinins were produced in human blood When we give a blood transfusion we try to provide red cells which will not react with *agglutinins* present in the recipient's serum otherwise the donor's cells may be destroyed and the recipient suffer grave or even fatal reactions, only factors that produce agglutinins are therefore important so far as safe transfusion is concerned For this reason the subdivision of group A does not seriously concern the transfusionist, with the exception of the few members of group A_2B whose serum contains anti O agglutinin The group A_2B is distinguished by the weak reaction of the cells with standard anti A sera, and in practice its existence makes it advisable to carry out proper cross matching tests when transfusing group AB recipients and to avoid group O blood unless such testing is available

Another agglutinogen studied by Landsteiner and Wiener[1] was discovered by the use of serum prepared by injecting rabbits or better guineapigs, with the blood of rhesus monkeys, this factor was designated Rh About 85% of normal white people showed this factor in their blood, about 15% were Rh— As in the case of the M N factors, iso antibodies for the Rh do not normally appear in human serum, but cases have arisen in which the anti-Rh antibodies have occurred and serious post transfusion reactions have been traced to their presence Wiener and Peters[2] described four such cases of hæmolytic reaction following transfusion of apparently compatible blood, and Wiener[3] himself later described further cases All these patients had Rh— cells and the reactions occurred after transfusion of Rh+ blood The mechanism seems to be that a certain proportion of Rh— persons can produce anti-Rh antibodies if they are transfused with Rh+ blood At the first transfusion there is nothing more than a slow, often unnoticed, hæmolysis of the Rh+ cells, but they have been recognised as foreign and antibody has been produced against them Consequently the next transfusion of the Rh+ cells is followed by all the phenomena of an incompatible blood-transfusion—in one case the patient died From this explanation Rh incompatibility would only be expected in patients receiving second or subsequent transfusions, but an interesting exception has arisen in transfusions given for intra or post partum hæmorrhage when cases of Rh incompatibility have been reported with the first transfusion The reason for this is thought to be as follows Landsteiner and Wiener calculate that about 72% of children from all Rh+ × Rh— matings should be Rh+, an Rh— mother with an Rh+ child may develop anti-Rh antibodies in response to the fœtal agglutinogen, if such a patient is transfused with Rh+ but otherwise compatible blood, transfusion reactions may follow The practical conclusion from this work is clearly that Rh— recipients should be transfused from Rh— donors, especially when transfusion is needed for the complications of pregnancy Wiener says that for such a patient, say of group A, it is safer to give group O Rh— blood than group A Rh+ This is easier said than done—it necessitates either special guineapig sera or serum from a human being known to contain anti-Rh antibodies Neither of these are readily available, but if they can be obtained, Wiener recommends that a register of Rh— donors should be kept so that Rh— blood could be reserved for patients in whom Rh incompatibility might arise Wiener also thinks that some of the reactions that have been attributed to the use of group O blood as "universal donor" were really due to the Rh factor It is known that some group O sera have exceptionally active anti A and anti-B iso agglutinins and such bloods are thought to be unsuitable for transfusion into patients of other groups Witebsky and Klendshoj[4] have been investigating the possibility of absorbing these agglutinins with isolated A-specific and B specific substances and report good results, but these substances are difficult to prepare The really safe universal donor can at present be defined as a group O donor with Rh— cells and weak isoagglutinins in the serum Such blood will be safe for all except those fortunately very rare recipients whose serum contains anti O isoantibodies

This work on property Rh, the detection of anti O isoantibodies and the reported isolation of an O-specific substance[4] warns us that blood-grouping is a much more complicated affair than was originally thought But a sense of proportion will be maintained if we remember that only 1 out of 7 persons is Rh—, that only some of those develop serious anti-Rh reactions and that persons with anti-O serum are much rarer All the same, we have been warned, and the means of guarding against these snags ought to be developed by the transfusion services

CARDIAC REFERRED PAIN

SINCE Heberden's classic description of angina pector it has been known that the pain of myocardial ischæm may radiate to areas of the body well removed from th sternum But it has not been widely appreciated tha such pain may arise in a paroxysmal manner in the fac arm or leg without any substernal distress, althoug Heberden clearly described one such case Perhaps th commonest site for this extracardiac pain is at th wrist or elbow, and Mackenzie, Osler and Allbutt stressed the diagnostic puzzle such cases often presen The clue that leads one to suspect the coronary orig of such paroxysms is precisely the same that points the heart in cases of substernal distress In both th onset of pain is related to effort, and instances are m with in which, without any chest pain, death has followe A man may be walking uphill when he is seized with pa in both palms or wrists and dies suddenly In othe cases the peripheral pain precedes the onset of chest pa by many years There is another group of cases which coronary artery disease is associated with chron pain in the shoulder or arm Askey[5] has reported the ph nomenon in 22 patients, all of whom showed indisputab clinical and electrocardiographic evidence of coronar artery disease Coronary occlusion was diagnose in 18 and angina pectoris in 4 The syndrome consiste of pain and stiffness in the shoulder and hand, usually o the left side, with swelling of the hand It resembled attack of periarthritis and was always coincident wit or followed coronary occlusion or persistent angin pectoris The pain was rather intractable and som times persisted for months Improvement was gradu and treatment was of little help Sometimes there w evidence of pre existing mild arthritic changes but th cardiac attack produced a sudden exacerbation This

---

[1] Landsteiner, K and Wiener, A S *J exper Med* 1941, 74 309

[2] Wiener and Peters H R *Ann intern Med* 1940, 13, 2306

[3] *Arch Path* 1941, 32, 227

[4] Witebsky, E and Klendshoj, N C *Science* 1941, 94, 256

[5] Askey, J M *Amer Heart J* July, 1941, p 1

Special Articles

"YOUR TEETH"

THE PROBLEM OF DENTAL CARIES

E VAUGHAN TOMEY, L D S R C S

IT is impossible to write a book which will be acceptable in toto to highly educated professional men and women as well as to the lay public, and in " Your Teeth " Prof P J Brekhus [1] has fallen between two stools The book is fascinating in parts and tiresome in others, and the distinguished writer rarely speaks with the voice of authority which his readers are entitled to expect He gives an epitome of the published opinions of workers in many countries—and these though stimulating are often contradictory The masterly survey of the causes of dental caries and pyorrhœa and of facts relating to the teeth of other races will appeal to students, qualified dentists and doctors alike , but Professor Brekhus claims that the book is designed to enlighten " intelligent people outside the profession who for decades have been told a great many things about the teeth which are not so " If this is his object, the book is probably too technical, though certainly the chapter on the development of human teeth and the teeth of animals, fishes and prehistoric man is written in a manner to interest the lay reader—or perhaps to capture the fancy of dental teachers, for comparative dental anatomy is not taught in American schools In this country, thanks to the influence of Charles Tomes and John Humphreys, it has always formed part of the curriculum though students are apt to regard it as a waste of precious time

A BAD START

Professor Brekhus regrets the inadequate attention given to children's teeth in America , English dentists will enter fully into his feelings for the amount of dental care necessary in many schools and infant welfare centres in this country is appalling and the service available generally inadequate True some authorities provide adequate service—Cambridge is notably good—but in many places the dental service is a mere sham resulting in mutilation of the mouth and features of children by he wholesale premature extraction of deciduous teeth This is not an aspersion on the dental officers they devote themselves wholeheartedly to the work, but they are swamped by accumulated neglect in more children than they can possibly treat For instance, how can a part-time dental officer attending for four sessions a week look after the teeth of three or four thousand children of all ages, when 85% of them need treatment ? The state should provide adequate dental care for all children, starting in the infant welfare centres, and this should continue until they are entitled to dental benefit under the National Health Insurance Act Adequate dental treatment implies inspection every six months, which is the custom followed in Sweden and New Zealand, and which formed part of the dental service in Norway before the war If children's teeth are treated once a year, as the Ministry of Health stipulates, or once in eighteen months or even longer as sometimes happens in practice, the end-result is not preservation of teeth but gross oral sepsis leading to the multiplication of tonsillectomies and much general ill health By the time a child is seen he often needs many extractions, and is left with a mouth incapable of masticating ordinary food , this does not conduce to good nutrition nor does it improve his jaws and features

POOR TEETH AND POOR HEALTH

The price we pay for this neglect is doubtless high, and there must be some preventive measures we could take in order to avoid such eternal tinkering when the damage has been done Dental caries is related to heredity, diet, health, environment and occupation H P Pickerill has pointed out that since civilisation itself cannot cause an increase of dental troubles, it must be some particular, though not always essential, accompaniment of civilisation which is responsible Professor Brekhus has not helped us to put a finger on the common factor and indeed some of his deductions from the evidence before him seem rather sweeping He tries to prove for instance, that there is no relation between good health and good teeth The teeth of all the athletic students at the University of Minnesota were examined and on the average proved to be no better than those of ordinary students To find that the best physical specimens had teeth no better than the average was in the Professor's words a severe jolt But it is noteworthy that the athletes were not compared with students in poor health , and there were no data for assuming that the athletes were healthier than the general run of students Moreover good health is not necessarily continuous throughout life A man who is perfectly healthy today may have had measles, scarlet fever stomatitis, smallpox, chicken-pox, typhoid or rheumatic fever at the time when his teeth were being calcified , and being poorly calcified they have probably failed to resist decay, as Professor Brekhus himself admits In my opinion measles is the outstanding cause of dental decay and oral sepsis in children as well as of much lifelong deafness , yet our medical authorities do relatively little to get rid of this canker in our national health Infantile vaccination is another common cause of caries and from the dental point of view it would be better if vaccination were postponed until the age of 6 or 7 when the crowns of most of the teeth are calcified The relationship between septic teeth and tonsillitis is now generally recognised in school clinics in Great Britain , all septic teeth are now extracted before the tonsils are removed and in many cases the tonsillitis clears up after these extractions and tonsillectomy becomes unnecessary Yet one of the authorities quoted by Professor Brekhus states " In the light of our present knowledge the removal of such local infection in the hope of influencing remote and general symptoms and disease must still be regarded as an experimental procedure not devoid of hazard " Certainly septic teeth should not be extracted at the critical stage of any illness even if they are the direct cause of it , this applies particularly to kidney infections, where extraction of teeth may precipitate a flare up which may even prove fatal But in this country, where our climate possibly helps to multiply the upper respiratory infections caused by focal infection, we regard the removal of all such foci as necessary whether they are in teeth, tonsils, sinuses, intestines or urinary tract It behoves every dentist, however to make sure that the work he does in the patient's mouth is not a potential cause of ill health

Professor Brekhus dismisses rather summarily the fact that pregnancy may be one of the causes of loss of teeth The old saying that a woman loses a tooth for every child is not without its grain of truth There is seldom general caries , if there is, it suggests deficiency of calcium and vitamin D, which should be given at once in the interests of both mother and child , but quite often one tooth decays and that generally very rapidly Professor Brekhus compares the incidence of caries in women and men , it is noteworthy that women show a greater percentage of caries during the years of menstruation, but attain the same level as men after the menopause , the loss of calcium in the menstrual flow is a likely explanation He mentions a theory that anxiety neurosis may be responsible for the so-called caries of pregnancy and suggests that the same neurosis may account for the fact that various members of a family living under the same conditions and on the same food, may show varying degrees of caries But it must be borne in mind that the family are unlikely to be eating the same things although a uniform diet may be provided , one won't like cabbage, carrots, or green vegetables, while another will eat his share and generally speaking the second will be free from caries while the first will not

TOOTHBRUSHES, NATURAL AND ACQUIRED

Professor Brekhus is also a little wide of the mark in saying that many uncivilised or semi-civilised races practise no dental hygiene Some at least have a strict ritual, cleaning their teeth with special roots the ends of which are chewed to form a brush , they often carry such roots round with them in the folds of their garments I have a bundle of these roots and they undoubtedly viruses, the St Louis encephalitis virus and the western strain of equine encephalomyelitis virus Hammon[1] in the Yakima Valley, has found that of 50 people who had clinical symptoms of encephalitis 42 had immune bodies in their blood to the western equine encephalomyelitis virus and 36 to the virus of St Louis encephalitis, while 28 had immune bodies to both An examination of sera from 75 people who had not had encephalitis but had lived in the same area showed that 3 had immune bodies for the western equine encephalomyelitis virus, 19 for the St Louis virus and 2 for both Philip, Cox and Fountain[2] in Weld County, Colorado, obtained very similar results An examination of the sera of 14 people ill in 1940 showed that 7 gave protection against St Louis virus 1 of these 7 also protecting against western equine encephalomyelitis, of 5 sera from people ill in 1938 and 1939, 4 protected against St Louis virus and 1 against equine encephalomyelitis In addition immune bodies to both viruses were present in the blood of horses so that western equine encephalomyelitis and St Louis encephalitis must both have been present in Colorado from 1938 to 1940 in men and in horses Immune bodies to both viruses were obtained from the bloods of horses in Montana Following on these results Cox Philip and Kilpatrick[3] showed that when horses were injected intracerebrally with St Louis encephalitis virus they suffered from clinical symptoms which were indistinguishable from those induced in horses by the injection of western equine encephalomyelitis virus The fact that in the western states of America horses not infrequently suffer from two attacks of encephalomyelitis is thus satisfactorily explained It is also perhaps not very surprising to find that, as might have been expected from the seasonal incidence of the diseases both St Louis virus and western equine encephalomyelitis virus have been obtained from wild *Culex tarsalis* mosquitoes caught in the infected areas[4] Thus the two viruses have the same vector, and from other observations made by Hammon and his colleagues[5] it seems that the two viruses may also cause inapparent infections in the same very large series of wild and domestic animals Finally there is evidence that western equine encephalomyelitis is either spreading to new areas both in the United States[6] and in Canada,[7] or that for reasons that are not yet understood, it has extended its range in these areas, from wild and domestic animals in which it is non pathogenic, to horses and man In Canada, in the provinces of Manitoba, Saskatchewan and Alberta western equine encephalomyelitis has been associated during the present year not with St Louis encephalitis but with a devastating outbreak of poliomyelitis It is impossible not to be struck by the resemblance between the story of St Louis encephalitis and western equine encephalomyelitis, as they are gradually being unravelled, and that of yellow fever here too it now appears that the infection of man is merely an incident in the main life story of the virus, yellow fever being primarily an inapparent infection of animals

---

[1] Your Teeth By Peter J Brekhus B A , D D S professor of oral diagnosis University of Minnesota London Humphrey ord University Press Pp 225 15s 6d

HONORARY FELLOWSHIPS

At the last meeting of the council of the Royal College of Surgeons of England it was decided to confer the honorary fellowship of the college on Sir EARLE PAGE, CH M, minister representing the Australian government in London and on Prof A T JURASZ dean of the Polish Faculty of Medicine in the University of Edinburgh

NEW YEAR HONOURS

A LONG list of awards to medical men and women for public service of many kinds will be found on a later page The awards are spread wider than at any time within our experience and there must be few of us who do not come as it were, within the penumbra of fame It is good to move in the circle of those who have deserved well of the community and we are inclined to say with Tiny Tim at the turn of the year God bless us one and all Within the circle too are some medical associates to whom we would tender congratulation among them Mr George Aylwen, treasurer of Bart's, who become a knight and Miss R E Darbyshire, sometime matron of U C H and now matron in chief of the joint Red Cross who receives the C B E Miss Darbyshire was a valued member of THE LANCET Commission on Nursing

THE ARYAN MYTH

> "The blood substance of the German race constitutes so prominent and unique an asset to the world that we should be justified in counting it the duty of the entire human race in gratitude, to safeguard the Germanic element"

WHEN Gobineau originated his racial theory in 1853 John Stuart Mill observed "Of all the vulgar modes of escaping from the consideration of the effect of social and moral influences on the human mind the most vulgar is that of attributing the diversities of conduct and character to inherent natural differences" Dr Joseph Needham, in a clearheaded little pamphlet[1] reviews the basis of Nazi ideology which has led the Germans into such strange behaviour disorders Thus he quotes the assertion of Frank set out above and many other Nazi writers in similar vein He shows how the Nazis could never have taken power unless the world had been divided into two camps after the last war Hitler was able to play on the hopes and fears of the capitalist countries by threatening them with a rising tide of socialism which he asserted only he could stem At the same time he was exploiting the German people under the banner of National Socialism Humans in general are naturally peaceful, and a philosophy of blood and soil had to be pumped into the Germans by continuous propaganda until they came to believe that the German race was the supreme being If this was accepted it followed that war and plunder and the extermination of inferior or subhuman races was a logical pursuit The weakest link in this irrational chain of thought was the first premise that the German race was superior to the rest of the inhabitants of this planet Scientists were liable to assert that there was no such thing as a German race that it had no special attributes distinguishing it biologically from any other group of men, and that blood (which in any case is distinct from the germ plasm) has no magic properties Science had therefore to be dethroned, and a new era of anti rationalism was ushered in With the elimination by exile, concentration or liquidation of all scientists in Germany who did not accept the new science came the decline in the output, both quantitative and qualitative, of German scientific publications Not only were so called non-Aryan scientists dismissed in Germany but reference to the work of any such scientists abroad proscribed If reference to a Jewish author was essential the work had to be listed separately from the Aryan bibliography It is instructive to note that a gentile who supports a Jewish scientific theory is termed a "white Jew," and is similarly proscribed, this is the corollary of the Japanese privilege of being accepted as an "honorary Aryan"

THE new extensions to the National Health Insurance scheme (see *Lancet*, 1941, ii, 113) came into force last Monday when some 500,000 new contributors with incomes of £250 to £420 became potential panel patients

---

[1] Hammon W M *J Amer med Ass* 1941 117, 161
[2] Philip C B, Cox H R and Fountain J H *Publ Hlth Rep Wash* 1941, 56, 1388
[3] Cox, H R Philip and Kilpatrick J W *Ibid* 1941 56 1391
[4] Hammon, Reeves, W C, Brookman, B, Izumi, E M and Jullin, C M G *Science* 1941 94 328
[5] Hammon Gray, J A, Evans F C Izumi and Lundy H W *Ibid*, p 305
[6] Randell, R and Eichhorn, E A *Ibid* 93 595
[7] Editorial *Canad med Ass J* 1941, 45 351

[1] The Nazi Attack on International Science Joseph Needham Sc D, F R S London Watts and Co Pp 47 6d

In England Now

A Running Commentary by Peripatetic Correspondents

THE end of the year has not been uneventful. Just before Christmas Sirene, one of our young virgin goats, began to wail unashamedly for a husband, so we hastily packed her into the car with the children and introduced her to the obliging young billy at Mr. Puddecombe's. "He's served a couple already this morning," said Mr. Puddecombe, "but I daresay as he *can manage another*." He could. We noted that, as in tennis, he was allowed two services. The grim sequel to this story is that, just a week later, the billy suddenly and quite unaccountably died. There were no marks of violence on the body when it was discovered in the morning by Mr. Puddecombe, who stated that when he took him his hay ration on the previous night the billy had been in the best of health and spirits and jumping around on his chain. So far as we know he had no financial or domestic problems such as might drive him to suicide, nor was he "blawed," which excludes *the "information."* At present we are left wondering but are hoping for a postmortem if we can get the consent of his relations.

The polecat ferret, described by its owner as very fierce and wild, who came up on Christmas Eve to bolt the rabbits out of our hedges, went instantly to ground and stayed there. No blandishments, no succulent rabbit's innards scattered round the mouth of the hole could bring him to the surface and he remained underground overnight to the consternation of his owner. On Christmas morning father, mother and two children formed themselves into a working party to dig him out but met with no success. When about to abandon the search we suddenly espied him streaking across the meadow to a neighbouring covert, no doubt to fetch his Christmas dinner. In the very act of getting to ground again he was secured by the tail by mother—father having missed—and was conveyed in triumph to his bag where he consoled himself with some of the less obviously edible portions of Gert, one of our two geese bought as goslings and cruelly fattened for Christmas; Daisy, her sister, was bought by a biologist who took her away on his bicycle (*not* made for two). The baby let the polecat out of the bag later in the day but this time he was secured before he could reach his beloved hedge.

On Christmas *afternoon* we were entertained by the garage-proprietor, a great amateur of magic, to half an hour of conjuring. Except for a couple of two-year-olds who expressed their boredom and contempt by getting up in the middle and going out into the garden, we were all suitably enthralled and mystified. Father, of course, was the stooge who could be relied on invariably to do or say the foolish thing. He was scored off times without number; it was really rather pathetic. Tomorrow we have to attend a matinee performance of an amateur pantomime and very shortly we have to put our Christmas holiday play into rehearsal. It's a hard life.

* * *

"Why on earth do they keep all the bottles on the floor?" was Durrant's *opening* question when we entered the mess. I shook him by my monosyllabic reply of "Blast!" but I hastened to explain that the general air of orderliness—the surrounding quietness, the serenity of the late summer sea—belied the true state of affairs, and that fierce activity lay smouldering beneath the surface ready to break out at any moment into the flames of war. The first time that the bottles and glasses were wrecked was a notable occasion. A small boat far away on the horizon, apparently headed in the direction of the harbour, failed to satisfy the belligerent curiosity of the officer on duty, who promptly set in motion a sequence of events which landed me on the mess-room floor in a seat of sherry, beer, gin and whisky liberally studded with spicules of shattered glass. For the first time, and quite forcibly, I realised that the mess was immediately underneath a gun. And I was told later that *the shell landed* very neatly ahead of the trespasser's bows, thus signalling the last lap of the voyage to a vessel which eventually proved to contain a cargo of *harmless refugees*. A less important but simultaneous disaster was the loss of all my bottles of medicine which had been sedulously scrounged and jealously hoarded over a period of several weeks. The medicine was also kept on the floor after that costly day.

As we were *leaving the fort I could not refrain from* showing Durrant the black hole where I was expected to treat the sick when I first arrived and to point the contrast to the good conditions in which he would start work. A dank, dark, musty room it was, on the periphery of the building, and the floor had been partly ripped up in the course of alterations that were going on at the same time as sick parade; a gang of workmen were desultorily hacking and hammering at the walls and so conscientious were they that they declined to down tools even while I was examining the sick. They begged me not to worry and declared that I would not be in their way. This naive opposition to my desires only served to increase my wrath, which was heightened still further when a face appeared in the doorway and ordered me to remain at my post because a visiting brigadier was on his way round. Being green to Army ways I guessed that it must be supremely important for the M.O. to be seen in the dungeon set aside as a sick bay. I was so vividly green, *in fact, that I thought what a splendid opportunity* there would be to demonstrate to this high dignitary the full horror of the situation and arouse his interest and enthusiasm for immediate improvements. I stood (assuming that the absence of a chair was part of the technique of "toughening the soldiers") for two solid hours, my head reeling with incipient stages of illness, my temperature rising steadily, and my nose dripping in tempo with the ceiling and walls, *until at last the august* personage arrived. While I stood shivering at the salute he cast a glassy eye around the room, backed on to the toes of his staff, whom he cursed for ever having brought him to such a place, and rumbled off down the corridor muttering and growling. If only I had known. My only consolation was that I heard a few days later that the good man was too ill to attend a firing demonstration.

When we got out into the sunlight again Durrant told me that he was beginning to realise that he was getting off fairly lightly. We stood watching the fishing, one of the chief amusements on the fort, carried out under the critical eye of the "Quarter Bloke," a lordly person whose rumoured exploits had won for him the awe of all the younger fisher men. He owned a small coracle which he kept on the fort and which gave him instant superiority over the amateur anglers because he could wave his arm airily in the direction of the middle distance, saying: "If this breeze dies down the pollock will be biting over there in about half an hour." Strangely enough, if he deigned to row out and cast a line after making one of these oracular pronouncements he would return with a splendid basket of pollock. It was also alleged that should a bass or a mackerel take the bait on such a day he would promptly return it to the deep, and if questioned about such extraordinary behaviour he would reply: "If I fish for bass I fish for bass. But I don't want them when I'm fishing for pollock". And this even if it meant coming back empty-handed.

But the easiest way of fishing out here is to stand by for an air-raid. Since the bombs usually drop in the sea their concussion stuns and brings to the surface so many fish that the first available man simply rows out and collects a boat-load. Occasionally the Hun is good enough to make a mess of dropping one of his mines; the explosion is then a source of considerable gratification because not only does it *portend a fish tea for the whole* garrison, but also means that enormous baskets of assorted fish can be sent to friends and relatives.

The *Ladybird*, which now arrived to take us ashore, is perhaps the most cleverly handled craft on the whole coast. In peace-time she conveys holiday-makers on day trips to a resort many miles away. Even when the furies of the sea are raging in their worst temper she will convey mails and rations to the forts, transport the M.O. and collect the sick. There is not much time now before my train leaves, and I have to rush Durrant on and off one fort after another and introduce him to the officers. As the boat carries us in I give him a brief outline of the remainder of the work. I tell him how the characteristics of the units vary, how welcome he will be for a meal anywhere at any time, how to arrange the timetables for the week. I point out an area of the rocks that is infested with rats, explaining the measures I have taken to try to keep them down. I suggest the best contain antiseptic and astringent substances Professor Brekhus has confused oral hygiene with prevalence of the toothbrush—perhaps the dirtiest and most unhygienic implement conceivable He says for example, that the Eskimos use no dental hygiene, but they chew the raw hide of seals to soften it and work it into shape and the children chew lumps of seal blubber—a great advance on the pernicious rubber teat It is well known—and the figures he quotes confirm it—that many races have perfect dentition until brought into contact with civilisation When Eskimos come into contact with civilisation they eat the foods of the newcomers and caries becomes common among them And there are other important factors civilisation brings such diseases as measles and smallpox, and it also brings refined sugar Raw sugar cane, chewed by many native children in the West Indies, does not seem to cause dental caries, but refined sugar undoubtedly does The people of America probably have a sweeter tooth than any other nation and according to Professor Brekhus's figures they have the highest percentage of dental decay—even higher than ours—and that in spite of being more tooth-conscious than any people in the world

NEW YEAR HONOURS

THE honours list issued on Jan 1 contains the following names of members of the medical profession —

BARON

SIR AUCKLAND GEDDES P C, G C M G, K C B, T D M D EDIN, LL D For public services

KNIGHTS BACHELOR

RATANJI DINSHAH DALAL, C I E, M R C P, D P H
Member of the Central Legislative Assembly of India
SAMUEL GURNEY DIXON M D CAMB, J P
Chairman of the Hampshire education committee and of the education committee of the County Councils Association

C B

Temporary Surgeon Rear Admiral GORDON GORDON TAYLOR, O B E, M S LOND, F R C S
Senior surgeon to the Middlesex Hospital
Lieut General ALEXANDER HOOD, C B E M D EDIN, K H P
Director general, Army Medical Services

C M G

HARRY CHAPMAN SINDERSON, O B E, M V O, M D EDIN, F R C P E D T M & H
Professor of medicine, Royal College of Medicine, Iraq
THOMAS GEORGE WILSON, M D SYDNEY, F A C S F R A C S, F R C O G
Consulting gynæcologist to Adelaide Hospital

C I E

Lieut -Colonel MADAN GOPAL BHANDARI, M B PUNJAB, D T M & H I M S
Inspector general of prisons, Bombay
Lieut Colonel MARTIN MELVIN CRUICKSHANK, CH M, M D ABERD, F R C S E, F A C S, D O M S, I M S
Chief medical officer and civil surgeon, Delhi and lately superintendent of the Government General Hospital, Madras
Lieut Colonel WILLIAM ELLIOT RANDALL DIMOND, L R C P I, D P H, I M S
Lately officiating inspector general of civil hospitals, North West Frontier Province
Lieut Colonel ARTHUR HENRY HARTY, M R C S, I M S
Civil surgeon and superintendent B J medical school, and superintendent Ahmedabad Mental Hospital, Bombay
Lieut Colonel ROBERT HAY, M B EDIN, D P H, D T M & H, I M S
Deputy director general, I M S

C B E

GEORGE CRANSTON ANDERSON, M D EDIN, LL D, F R C P
Secretary to the British Medical Association
Colonel (Acting Brigadier) JOHN CECIL ALEXANDER DOWSE, M C, M B DUBL, M R C O G, late R A M C
RICHARD LIONEL SPITTEL F R C S
Consulting surgeon to the General Hospital, Colombo
Air Vice Marshal WILLIAM TYRRELL, D S O, M C M B BELF, D P H, K H S

O B E

CYRIL JOHN AUSTIN, M B EDIN
Medical officer, Fiji
WALTER BIGGAR BANNERMAN, M R C S, D P H
Medical officer of health for Orkney
Surgeon Commander DRUMMOND REWCASTLE FORBES BERTRAM, M B DURH, R N
Surgeon Commander HAROLD KEITH CORKHILL, V D, M B EDIN, F R A C S, R N Z N V R
Surgeon to the Wellington Hospital
JOHN FARQUHAR DAVIDSON, M B ABERD, D P H
Medical officer of health for Somerset
JOHN LLOYD DAVIES, M D LOND, M R C P, F R C S E, D P H
Part time E M S specialist and group adviser to the hospital officer, Wales region
Captain (temporary Major) DEREK ERNEST DENNY BROWN, D PHIL OXFD, M B N Z, F R C P, R A M C
Professor of neurology at Harvard University
DESMOND DREW, M B DUBL
Principal medical officer, Swaziland
(Mrs) MARY JESSIE GIBBONS, M R C S
In charge of U M C A Hospital, Minaki, Dar es Salaam
Major GURDIAL SINGH GILL M B EDIN, I M S
Inspector general of Prisons Madras
STEPHEN DOUGLAS STURTON, M D CAMB, D T M
Head of the Church Missionary Hospital, Hangchow
Lieut Colonel DAYA RAM THAPAR, M B EDIN, D T M & H, I M S
Squadron Leader HECTOR MACDONALD WALKER, M D GLASG, R A F V R
Major JOHN GEORGE GLYN WHITE, M B MELB, A A M C
GEOFFREY COMMELINE WILLIAMS, M A OXFD, M R C S, D P H
Medical officer of health for Oxford

M B E

PALANTHIKAL VARKEY CHERIYAN
Surgeon i/c of E N T department, Government General Hospital, Madras
Surgeon Lieut HERBERT WILLIAM CLEGG, M B MANC, R N V R
JAMES DANIEL DYSON, M B LOND D P M
Medical superintendent, Mental Hospital, Mauritius
Captain CORNELIUS JEFFCOTT HASSETT, M B DUBL, I M S
Agency surgeon, North Waziristan, and medical officer, Tochi Scouts, N W F Province
HASSAN SHUKRI KHALIDI, M D BEIRUT
Medical officer, Jaffa, Palestine
Captain and Brevet Major (acting Major) JAMES WILLIAM ARTHUR PARSONS, L R C P I, I M S
ALOYSIUS XAVIER PEREIRA
Resident medical officer civil hospital, Karachi
SRI RAO BAHADUR TRICHINOPOLY ADIMULAM PILLAI RAJA PILLAI
Medical practitioner, Coimbatore, Madras
JOTINDRA MOHAN RAKSHIT M B BOMBAY, F R C S E
Chief medical officer, Tata Iron & Steel Co, Jamshedpur, Bihar
Temporary Surgeon Lieutenant ERIC ANTONY SPOUTE, L M S S A, R N V R
(Mrs) MARJORIE MORTON STEWART M B EDIN
Joint centre organiser, Women's Voluntary Services for Civil Defence, Kingston upon-Hull
Captain (Senior assistant surgeon) KENNETH WILLIAM EVERARD WHITE
I M department

KAISAR-I-HIND MEDAL

(Miss) ANNA POLLOCK MARTIN M D GLASG, M R C O G
In charge of the Muse Memorial Hospital, Nagpur
(Miss) LOUISA MARGUERETTA POYNDER, M D LAUSANNE, M R C S Medical practitioner, Simla

---

ORDER OF THE HOSPITAL OF ST JOHN OF JERUSALEM —The King has sanctioned the following promotions in, and appointments to, this order —

As Bailiff Grand Cross —Col Charles Joseph Trimble, L R C P I

As Knight —Richard Clegg M R C S

As Commanders —Roland Nightingale, M D William Egbert Thompson M B, Winston St Andrew St John M R C S, Major George Aylwen John Henry Dain O B E Major General Ralph Bignell Ainsworth M R C S and William Gibson M D

As Officers —Cornelius Thompson M B Lieut Colonel Albert Jones, M D, Robert Rutherford M B, Frank Robert Barnard Howard Kennedy, L R C P I, Arthur Burton, M D Norman Manson M B, Frank Samuel Hardy M R C S Harold Edwin Thomas M R C S, Archibald Oliver M D and Alfred George Timbrell Fisher F R C S

Letters to the Editor

THE FUTURE OF MEDICAL RESEARCH

SIR,—I read with pleasure the stimulating, if rather utopian, proposals of Dr. Walther in your issue of Dec. 27. Like him I should welcome an organisation which "accumulates sorts keeps in order and renders available everything that is known on every subject" as envisaged by Mr. H. G. Wells. Meanwhile it may be hoped that the advent of such an organisation will be preceded by the adoption of a universal scientific language; abstracts of articles in strange tongues cannot replace a study of the original papers.

I would like to supplement Dr. Walther's article by another suggestion. Often a worker bound to a specific inquiry will notice promising side-issues which he cannot pursue because they are beyond the orbit of his own particular investigation. In such an event human nature forbids him to give away his original observations without the prospect of acknowledgment, for the research worker is not well paid and lives largely on his reputation as the owner of a successful and original mind. After all, the novel but sound idea is the most valuable asset for research. It is easier to examine ore for gold than to discover a gold mine and there are many more people who are suitable for the job. Therefore I should propose that a Registry of Ideas be started in which could be enrolled under each author's name his suggestion for a new line of research, and the preliminary observations on which his idea is formed. Such a registry would require little financial support and might release for immediate use many a bright notion which at present lies dormant.

HAROLD BURROWS.

Chester Beatty Research Institute, London.

FRACTURED FEMORAL NECK

SIR,—Mr. Tippett in his letter of Dec. 27 on plaster treatment of fracture of the neck of the femur refers, I assume, to the abduction treatment. This he regards as a retrogression because of the danger of hypostatic congestion. Actually the chief advantage of the abduction method at the time of its introduction was the prevention of this, and of the other cause of mortality—infected bedsores. The patient was placed on an inclined plane, the head of the bed being raised, and was turned at intervals to the ventral posture. Personally I have had no experience with either of these complications. After the plaster has been removed the patient does not spend "three months in bed between sandbags or splints," but in this interval reconstructive exercises are carried out in order to assure the range of abduction and extension essential to a normal gait. The important question at issue is the influence of the early resumption of activity on the functional result. The nail is doubtless a secure temporary means of fixing the fragments but I doubt if it can be depended on to supplant natural resistance in weight bearing, or that it will so suppress the sensitiveness of the joint during the period of repair as to restrain the tendency toward restricted motion and the protective attitude. Since aseptic necrosis and degenerative changes in the joint are the result of impaired nutrition, it seems to me that the uninterrupted rest advocated by Thomas would favour repair rather than ambulation on crutches.

Mr. Tippett may care to look up my paper on abduction treatment in THE LANCET of 1913 (i, 1649).

The Athenæum. ROYAL WHITMAN.

REGIMENTAL MEDICAL OFFICERS

SIR,—The Army has absorbed and is still absorbing a number of qualified men. These doctors vary greatly in age, length of qualification, and experience in hospital and general practice. Some have been qualified only for a short time and have completed one hospital appointment. Others have been qualified for three or four years, have held several appointments, and see the way opening to the ladder which leads to the coveted eminence of consultants. Others again have been in general practice for ten or more years and have added experience of the world to the lore of the hospital. From each of these diverse groups a considerable proportion become regimental medical officers. It is not surprising if the experienced practitioner and the promising hospital alumnus alike consider that their accomplishments will not be put to their proper or fullest use if they are placed in posts which are also occupied by recently qualified men.

The opinion has become widely held that the duties of a regimental medical officer involve no requirements and offer no scope beyond the knowledge, experience and judgment of a man who has been qualified for six months, and that others are being bureaucratically underemployed if placed in these posts. The hospital alumnus will write to the War Office: "I feel that my special training during three years in hospital will be wasted as an ordinary regimental medical officer." The general practitioner will write (but less frequently): "I feel that my experience in general practice will be more useful in a hospital." The hospital authority desiring to retain a special man writes: "This is a man of experience and judgment whose training will be wasted as a regimental medical officer."

Such views are based on a misapprehension. The health and physical efficiency of the Army lies not in the hands of the hospital surgeon and physician or others of higher rank but in those of the regimental medical officers. To perform their duties efficiently requires considerable judgment and knowledge and many units have suffered from medical officers who may work conscientiously but have insufficient experience. The responsibilities are especially heavy in a training centre and the day's work may be long. The medical officer has to "mother" the recruit over teething troubles, from sore feet to home worries and the anxieties of a new environment, and his hand must be neither too heavy nor too light. A weak medical officer can reduce mediocre men to complete inefficiency, or aid them as they slip willingly downhill. A good regimental medical officer can do more for man-efficiency and man-power than any other officer in the R.A.M.C.

The duties of a regimental medical officer are laid down in the regulations for the Medical Services of the Army. The pages form a somewhat bald and unconvincing narrative, for no touch of human nature is discernible, and so medical officers, like all doctors, must learn their most important lessons outside the covers of a textbook. But one sentence may be quoted: "He (the M.O.) is the adviser to the O.C. unit on all medical matters pertaining to the health of the unit." This is strictly true and its importance is obvious. The position should be reciprocal and in the best units the O.C. is equally the adviser to the medical officer, and consequently a good O.C. usually has a good medical officer. But if the medical officer is too junior and inexperienced he has to struggle for himself with the same difficulties which he is expected to cope with in others, and the position is fair neither to himself nor to the men, nor is it to the benefit of the Army or the state. Consequently it is essential that it should not be considered that training and experience are wasted in these most important posts and that a sufficient supply of suitable men should be available. I repeat, the health and physical efficiency of the Army lies in the hands of the regimental medical officers.

H. LETHEBY TIDY,
War Office. Consulting Physician to the Army at Home.

WHAT'S IN THE LOAF?

SIR,—Lord Woolton is reported in the *Times* of Jan. 2 as having said: "There is no justification for the statement that wheatmeal can, under the terms of the instructions to the trade, consist of white flour and bran." The "terms of the instructions to the trade" have not been published, but there can be no question that the effect of the Statutory Order No. 1291, 1941, is, as you described it, to "permit 85% national wheatmeal to consist of white flour with added bran," and a Statutory Order must override any departmental "instructions."

Equally unsatisfactory, and indeed fallacious, is Lord Woolton's further statement that the current national wheatmeal loaf is "consistent" in its "content and nutritive value." As long as the safeguards stipulated by the Medical Research Council and quoted in your leader are ignored by the Ministry this wheatmeal loaf must remain suspect, and it is significant that notwithstanding an expensive advertising effort (costing £29 000) dating from the spring of 1941 (*Hansard*, July 9) the proportion of person to see about the roof over yonder that started a leak in yesterday's rain, and in general give him all the details of his strange and not very medical occupation In the afternoons he will be the only M O available in the neighbourhood, and will be kept busy training the orderlies and stretcher-bearers ashore probing into such problems as the sources and preservation of water-supplies and food-supplies in the event of invasion in an advisory rather than an executive capacity , the Army doctor simply has to keep an eye on these matters and be ready to help if required), checking up on the inoculation state of shore personnel, visiting those who fall sick while on leave in the vicinity, occasionally making a second trip to a fort to see a man suddenly ill, or in extreme emergency, meeting him when he is brought ashore But I know that in spite of all my protestations of the work to be done, Durrant will rarely have to forgo an evening's entertainment

Approaching land I notice a stray tardy jellyfish floating past on the ebb, and am reminded of a warm day six weeks or so before when scores of these translucent creatures appeared in the harbour followed by hundreds of thousands, until the ocean seemed carpeted with their protoplasmic masses quadranted with pink, mauve, red or purple suckers, suspended an inch or so beneath the sunlit water's surface—a sudden freak of nature no less astonishing for their number than their transience Hardly one remained on the following day

As I looked back and around at the chain of forts proudly manned by this happy breed of men, and as I watched Durrant set out on his first emergency call I hoped that he would be as lucky as I had been in his personal contacts There had been an example only a few nights before During dinner the telephone rang, and I was summoned to the outermost fort One of the men had cut his eyebrow, and my orderly thought it needed a stitch I just had time to catch the last duty-boat a journey never to be forgotten when the night is fine the cliffs of England, green-topped, mauve-faced in the setting sun standing out boldly, fold upon fold, as far as the enveloping haze, erect on the shores of nature's moat, and the men laughing as they recount the minor adventures of a day ashore—some returning from a week's leave, hard-faced, glad to have an excuse for conversation It does not take many minutes to suture the wound The job done, the mess orderly appears with the battery commander's compliments and would the doctor please step into the mess , the skipper has promised to keep the boat waiting a few minutes longer " Ah, there you are doc, what have you been doing to that wretched gunner's face ? Lifting it ? Well now what are you having ? Oh yes, all right, Sergeant Major, I know the skipper wants to get back but tell him that he simply *must* wait for a little longer tell him the doctor's just found one of the officers very ill (Jimmy report sick at once) " But even the skipper's patience is exhausted, and I am on the boat again , darkling clouds gather, stealing across the sky, the leaden sea scarce returns a glint of light , the cliffs are but a blurred mass far away, towering against early stars that glitter as if set in purple velvet The engines cease their stroke, a faint rippling rises to the ear as the boat glides to her mooring , men's voices, though hushed carry far in the twilight, seeming to come from strangely close , a spinning hawser lifts a fleck of spray to the cheek, and as one steps ashore a faintly stirring breeze whispers through the sedge and ushers in the night

* * *

On the road to knowledge man has often come to what appears to be the end Here is ultimate truth, he says—a created species, an element, a final conception of the atom Then after a time he sees it is not really the end , there's a vista trailing off into the unknown, waiting for his searching steps Prof Julian Huxley, overwhelmed by the finality of that infant science, genetics, cannot see how personality which depends on a particular set and arrangement of genes can survive their disintegration His reply in the Brains Trust of a couple of weeks ago reminds me of a pedagogue, an unpleasantly practical young man, holding forth on music " This affair of wood and gut is called a violin, and if struck in a particular way gives rise to musical noises Although all violins have peculiarities of their own, they are alike in their essentials " He has not come within reach of guessing that here is an instrument which when touched by the master hand can speak with an alluring voice to man, can whisper in his ear of worlds unroamed of passions undefined, of scenes beyond the range of human sight ,' whose patterns, tossed from mind to mind, from pole to pole from age to age, can live when it and the hands that conjured them are dust

* * *

The eldest boy is home for the holidays and h Christmas thank-you letters have confirmed the impression conveyed by his term-time weekly correspondence that spelling is not his strong point I discussed this with a expert in the scholastic world who assured me that nowadays it is more important to let the young express themselves freely than to hamper them by conta nagging over writing and spelling Certainly t examination papers brought home for my inspecti seemed to bear this out I could just read them a apparently the masters responsible for correction co too, for they had given good marks But the spelli was appalling After the examination papers I was n unprepared for the general tone of the report when came " Work and conduct excellent " it ran, and th as an afterthought the young and newly-promoted hou master had added " spelling week "

Obituary

CLIFFORD STUART HUMPHRIES

M B CAMB , CAPTAIN, R A M C

Dr Clifford Humphries, who died from abdomin wounds in the Middle East during November was t only child of Mr Stanley Humphries, now of Alsag Cheshire, and formerly of Blackheath and Sydenham At Westminster School and Trinity College, Cambridge, he was shy and studious, but at St Thomas's Hospital with his growing devotion to his profession he expanded He qualified in 1935 and took his Cambridge degree two years later After holding house-appointments at the Kent and Canterbury Hospital and the Royal Berkshire Hospital at Reading he went into private practice at Sydenham and Peckham, where his care for his patients was untiring He volunteered for full service when the national register of doctors was set up though war was abhorrent to him He was called up September, 1939, and in a few weeks he was in Fran Later he served in Greece and Crete and it was during t fighting in Libya that he was wounded

CASUALTIES OF THE WAR

Dr Thomas Langdon Butler, of Woodgreen, Han was reported missing after his ship was torpedoed in Decemb 1940, and he is now officially presumed killed Dr But qualified from St Mary's in 1901 and retired from the M chant Navy some 15 years ago When this war broke o though 71 years of age, he once more offered his service the P and O line, and he returned to work as a ship s surg till he was lost

The death is announced on Dec 23 of Captain Clar Henri François de Chalus, R A M C He was born in 1 and qualified from the University of Edinburgh in 1921 received his commission in May, 1940

Vitamins for Finland —The shortage of vitamin among the Finns is partly being met by Sweden whic sending them 1000 kg of vitamin C preparations during winter Corresponding quantities of rose hips collected Finland are being sent to Sweden, where the firm of Kernge chaft A B has the apparatus for manufacturing vitami preparations This firm has already supplied large quanti of vitamins to the Swedish army and Swedish Volunt Corps in Finland mily Planning Association, does not follow the fundamental policy of safe C B C clinical work—namely, that part from rubber) nothing is advised for use by the nic patients in the vagina that the practitioner advising would not himself be willing to masticate and swallow ily for long extended periods In that way *only* fety lies

Clinic for Constructive Birth Control
Whitfield Street, W 1 MARIE C STOPES

ANÆSTHETIC FLOWMETERS

SIR,—Professor Macintosh's remarks on flowmeters an 3, p 27) fail to obscure the main issue of priority used in my letter (Dec 20, p 776) When the ebe Gorman flowmeter is vertical the bobbin does tate Whether rotation per se is absolutely essential r practical purposes may be open to argument It is gnificant that at least three well-known American næsthetic machines are fitted with flowmeters involving e tapered tube principle In none of these is rotation feature, yet they are known to be accurate Whatever vestigations Richard Salt may have conducted in 937, and however generous Mr A Charles King may be the transference of his laurels, the fact remains ecorded in the correspondence files of the Rotameter ompany that Mr King first suggested the manufacture f rotameters for anæsthetic purposes in 1932

Harley Street, W 1 I W MAGILL

"A CONTRAST"

SIR,—It is natural that the Secretary of the Nursing ecruitment Centre should rise to her feet to accuse Dr arling of a non sequitur That doughty warrior Esther arling would have been disappointed otherwise All he same none of us can get away from the fact that a ariety of institutions take on "probationers" who are alled "nurses," who undergo some kind of a "training" nd who are accepted by the public as nurses, and they o prejudice nursing as a career however good the rospects of state registered nurses may be

In my judgment it is the elect, the nursing *profession*, he *state registered* nurses who should demand an end to his They know what nursing is and could be It will mean dilution, it does mean dilution and the people to control dilution in a profession are the skilled workers with Parliament to hold the ring Every member of Parliament must have at least two state registered nurses in his constituency Four hundred or so members of Parliament clamouring to put questions down on the order paper might end for ever scandals such as the *Royal Cornwall Gazette* reports Incidentally nurses would have found the way to democratic action saved their profession and brought us a step nearer to a national nursing service for old and young, rich and poor

Richmond Surrey G B CARTER

DISINFECTANT ON DRAUGHT

SIR —I have had a rather similar experience (though with a happy ending) to the tragic case reported in your issue of Dec 27 where phenol was given by a V A D nurse for gastric trouble Some 20 women donors had given about a pint of blood each for the E M S transfusion service Two felt faint and a V A D who had had considerable experience of this work in another large centre went to get a standard medicine for fainting Instead she poured out a dose of diluted "Monsol" for each, this came from large Winchester quart bottles and was used as a hand lotion One of the women drank half and promptly vomited it, the other drank the lot but suffered no ill effects The incident was incredibly stupid and the culprit dismissed herself after it though she treated it as a joke at the time

These incidents show the dangers of allowing shortcuts to a medical qualification of any kind The background our hospital nurses have saves them from such mistakes These nurses regard helping in the blood transfusion work as one of the plums of nursing work They rightly resent the way they are left out of such work in order that volunteers who are untrained by comparison can be kept interested Until a V A D nurse is as well trained as a hospital nurse she will serve her country best by relieving the more trained nurse of her less interesting tasks

TRANSFUSION

Public Health

From the Annual Reports

WILLENHALL

Dr James Gregory's report of this urban district of 28,610 persons during 1940 shows that the war has so far left its population unaffected Its birth-rate was 24 9, corrected death-rate 15 37 and infantile mortality 65 Of the 547 births registered in the year only 13 were illegitimate and there was neither stillbirth nor infantile mortality from illegitimate pregnancy The 45 new cases of tuberculosis gave an incidence-rate of 1 57 and the 27 deaths a mortality-rate of 0 94 Both rates are high as they are usually in Willenhall, but in such a small population annual variations are great Since 1912 there have been 1634 cases of tuberculosis notified with 850 deaths, a fatality of 50% "Practically the whole effort made against the disease has been with regard to treatment of established cases Little or nothing has been done to prevent new cases arising" This statement, made by Dr Gregory, is too sweeping, but it is true that our efforts in treating established pulmonary tuberculosis have done little to reduce its fatality, and what we have done to prevent the disease has of recent years been disappointing in its results In the list of deaths cancer stands first with 48 out of 355 deaths from all causes

A table of refuse collection shows the amount and character of what we usually discard as household rubbish The collection includes 75 tons of waste paper, 44 tons of tins, 11 tons of iron scrap, 2 tons of lead scrap, 7 5 tons of bottles, and 3 75 tons of sacking

NOTTINGHAM

Dr Cyril Banks's report, though short and shorn of the usual tables, contains five suggestions for post-war attention He thinks we should provide accommodation for children unable to look after themselves when a parent has to go into hospital, and for elderly people who cannot look after themselves and who cannot live alone His other suggestions are extended pathological service so that all practitioners on behalf of all persons can obtain all aids to diagnosis and treatment, such as is now available in Kent and in most American cities, extension of district-nursing arrangements, which in effect would be a national domestic nursing service, and cooperation of hospitals, on which Dr Banks has nothing fresh to say

Infantile mortality in Nottingham touched the low record for the city of 61 This is interesting, because 1940 was not a year with many low infantile mortality-rates and Nottingham in the past had a persistently high rate There was some increase in tuberculosis the number of cases on the register rose from 1191 to 1212 and the mortality from 0 98 to 1 03 The rate is high, for the average for the country is expected to work out at about 0 7 The increase, though disturbing, must not be taken at its face value, for there were circumstances which would raise the recorded rate without any increase in local fatality Cerebrospinal fever gave 58 cases with 15 deaths but of the 45 cases admitted to the isolation hospital only 7 died

Infectious Disease in England and Wales

WEEK ENDED DEC 27

Notifications —The following cases of infectious disease were notified during the week smallpox, 0, scarlet fever, 997; whooping-cough 1124, diphtheria, 845, paratyphoid, 5, typhoid, 14, measles (excluding rubella), 540, pneumonia (primary or influenzal), 751, puerperal pyrexia, 140, cerebrospinal fever 95; poliomyelitis, 11, polio-encephalitis, 1, encephalitis lethargica, 2, dysentery, 93, ophthalmia neonatorum, 46 No case of cholera, plague or typhus fever was notified during the week

Deaths —In 126 great towns there were no deaths from enteric fevers 2 (0) from measles, 1 (0) from scarlet fever, 8 (2) from whooping-cough, 32 (0) from diphtheria, 39 (0) from diarrhœa and enteritis under 2 years and 32 (1) from influenza The figures in parentheses are those for London itself

Liverpool reported 7 deaths from diphtheria

The number of stillbirths notified during the week was 148 (corresponding to a rate of 41 per thousand total births) including 15 in London wheatmeal remains at 5–7% of the bread consumption of our people

The obvious public anxiety, reflected both in Parliament and in the press, demands an impartial and authoritative examination of the bread position and I have put down on the Order Paper of the House of Commons the following motion (Dec 8) which has already obtained wide support from members of all parties

Wheatmeal bread,—" That a select committee be appointed to inquire what are the considerations which obstruct the exclusive provision as a war measure of a national wheatmeal loaf of the highest practicable extraction, and whether the objections to its adoption are such as to outweigh the practically unanimous recommendations of medical and scientific experts and the value of the tonnage which could be saved by the use of all imported wheat for human consumption, and to report with the least possible delay "

House of Commons E GRAHAM-LITTLE

THE CHRISTMAS GIFT RESULT

SIR,—I am grateful to you for your help in the success of the Christmas Gifts fund I would like to have written a personal letter of thanks to each donor but there have been so many who have very generously contributed that it is beyond my powers I am greatly indebted to those who have given time and trouble in organising collections or circulating my appeal to others

The response has been so satisfactory that we have been able to give a Christmas gift to each one of our regular beneficiaries and in addition a special New Year gift to the very poorest The sincere gratitude and appreciation shown in the letters of thanks proves beyond doubt what pleasure these gifts bring to our people and how greatly they have cheered many whose lives are very sad It is their thanks which I pass on to you and your readers I am sure that it will be your wish, as it is mine, that when each Christmas comes in the future the Royal Medical Benevolent Fund will continue this part of its benevolence, which reveals the spirit of brotherhood within the profession

THOMAS BARLOW
President, RMBF

Balliol House, Manorfields,
London, S W 15

EMERGENCY MEDICAL SERVICE

SIR,—The suggestion made in Dr Green-Armytage's letter published in your issue of Jan 3 that doctors employed in the Emergency Medical Service at a part-time salary of £500 a year are not rendering any substantial service in return for their salaries is not supported by the facts Doctors in the London sectors on a part-time contract with the Ministry put in, on an average, the equivalent of 6 sessions a week during December, 1941, a figure which would enable them to earn just over £500 a year on sessional contracts But for the financial limit imposed by the sessional form of contract they would earn about one and a half times their present salary. Many of them are engaged almost wholly on E M S work but prefer to take part-time work to enable them to assist in meeting the needs of the normal civilian population

Nor is it the case that these doctors have failed to reach their hospitals after a blitz Those who do not live in, or close to, the hospitals to which they are attached are resident in the large centres of population where heavy casualties are likely to occur Even if some of them could not reach the peripheral hospitals quickly, it would be equally impossible to evacuate patients to those hospitals, and operations which cannot be postponed must be carried out in the central hospital near where these doctors reside

The recruitment of medical men to the Services is under the Ministry, the responsibility of the Central Medical War Committee which has, to the end of 1941, met the Service needs to that date, as advised by the recommendations of the Medical Personnel (Priority) Committee The C M W C has also met in full the demands of the Services for specialists Until recently, 41 was the age-limit for recruitment and all medical practitioners are reviewed by the C M W C as the needs of the Services require Under the new National Service Act male practitioners up to 51, as well as women doctors up to 30, will be liable to recruitment and will have to be considered in meeting the demands

The Ministry is satisfied that the part-time practitioners have made a valuable contribution towards the country's needs by responding to all calls made on them

S F WILKINSON,
Director of Public Relations

Ministry of Health, S W 1

THE STICKINESS OF PLATELETS

SIR,—I agree with Dr Baar (Dec 20, p 775) that th disappearance of platelets from drawn blood is due both to their disintegration and to their adhesion to the wall of the glass container The proportionate manner of their loss depends on the conditions of the experiment The observations described in my recent paper (*J Path Bact* 1941, 53, 255) demonstrated that during the relatively short period of 80 minutes by far the greater number of these cells were removed by adhesion to the vessel wall This is borne out both by the comparatively slight disappearance of platelets from the control vessel whose walls had been lined with 'Vaseline' and by the recognition of these cells after staining, on the walls of the untreated vessels at the end of the experimental period Further, calculations of the approximate number of platelets deposited per square millimetre of the glass surface, and of the number that had disappeared from the rotated blood sample, show a satisfactory agreement which would not have been found had disintegration of large numbers of these cells taken place The observations of Dr Baar and Miss Szekely were made under conditions so unlike mine—their specimens of blood having been greatly diluted and kept for very much longer periods—that differences in the behaviour of the platelets might reasonably be expected and disintegration of a much larger proportion may well have taken place in their experiments

Farnborough, Kent HELEN PAYLING WRIGHT

TWINING MEMORIAL

SIR,—The Faculty of Radiologists proposes to establish a memorial to the late Dr E W Twining of Manchester and it has been decided that it shall take the form of a medal to be awarded biennially on the results of the examination for the fellowship of the faculty Dr Twining was a great teacher and took a keen interest i the training of radiologists and the establishment of higher qualification for them It is therefore though that such an award in his memory would be very appropriate Contributions, which should not exceed three guineas should be sent to the hon treasurer, at 32 Welbeck Street, W 1, and cheques made payable t " The Faculty of Radiologists "

S COCHRANE SHANKS, President
B W WINDEYER, Hon Treasurer
M H JUPE, Hon Secretary
S WHATELY DAVIDSO
E DUFF GRAY
Twining Memorial Committee

VOLPAR PRODUCTS

SIR,—Dr Jackson in your issue of Dec 27 supportin 'Volpar' says she has seen no sign of mercurial poisoning from its use Years ago when I first founded birt control clinics, neither did some of the then practisin medicals see any signs of mercurial poisoning when the advised the use of mercuric chloride as a vaginal douch It was under the care of her own medical practitione advising this that a school friend of my own nearly die until I found out what was going on and stopped i In any clinic with which I am connected I have neve permitted the use of a mercury compound, but we hear good deal of objection to volpar from those attendin our clinics after having been dissatisfied with the advic of the Family Planning Association That volpar definitely injurious I feel quite certain

The points raised by Dr R L Brown and Dr C Gamble, especially " that contraceptive efficienc measured by laboratory methods does not necessaril tally with clinical experience," should be taken to hea by the medicals of the Family Planning Association, f Drs Brown and Gamble enunciate a very importa sociological truth, that volpar " has not yet been show to be harmless when used regularly over a long period If even only a small percentage of women suffer fro using it, that makes it unsuitable for general clinic recommendation

As the founder of the Mothers' Clinics I deplore mo profoundly than I can express that the

Comments and Abstracts

RANSFUSION SITES

. STRAIN, M D MANITOBA M C P.S

EXPERIMENTAL SURGERY, MIRAJ MEDICAL CENTRE, INDIA

time severely shocked patients are met -
ıe usual transfusion sites have been
vise damaged, or have been rendered
epeated needle punctures hæmatomas
of the knife At such times one must
site if the patient is to be saved
commonly arise when an infant is

usion site should be quickly available,
ıout pain to the patient constant in
tion not liable to collapse when shock
eed after the transfusion is finished,
n area not too prone to damage and
n The veins of the antecubital fossa
st popular Failing these I use the
m or on the dorsum of the hand;
radial cephalic vein may be useful
veins are often difficult to find and
cases of collapse The superficial
particularly useful in infants The
just in front of the medial malleolus
nous vein just behind the external
in almost everyone Occasionally
rch of the foot is of value The
ıtal and superficial temporal veins
r transfusions but I never use them
the external jugular extremely
rule The frontal vein has direct
ling to the cavernous sinus and in
ver been prominent The super-
usually covered by hair it may
n infants
e available for transfusion The
ly be found medial to the femoral
out this guide may be lacking in a
atient The internal jugular vein is
han the external but extravasation into
lead to respiratory distress. I have
or transfusion though I have often used
ng specimens of blood from infants The
ned to the side so that the sternomastoid
nt and is held slightly down over the edge of
The needle is inserted at the mid-point of the
astoid and just posterior to it, with the point
towards the suprasternal notch, the needle
ıe vein without difficulty Another deep venous
sed for transfusion in infants is the superior
ınal sinus This lies very slightly to the right
idline and may be easily entered through the
fontanelle I have used this route many times
ays with reluctance

he last year Henning[1] in Germany and more
Tocantins and O'Neill[2] of Philadelphia have
ving infusions into the medullary cavity of the
n but I have not yet had experience of this
ıtly highly successful method

peritoneal infusion is useful for plasma or saline
cells are not absorbed by this route A blunt
advisable to prevent perforation of the intestine
pointed lumbar-puncture needle of 18 or 20
uitable The site usually chosen is in the mid-
below the umbilicus this being relatively
In very young infants it is best to insert the
ıe junction of the middle and outer two-thirds
ining the umbilicus and the anterior superior
for occasionally the hypogastric artery
nt for several days after birth[3]

SE OF THE CORPUS CAVERNOSUM

hen I was in charge of surgery at the Hunchow
ıtal, I was called to see a severely shocked
ıom vain attempts had been made to find the
arms by cutting down on them, until these sites seemed so mutilated as to be useless No veins were visible on the legs and no arterial pulsation could be felt despite the administration of adrenaline The man had an exceptionally large penis, and I decided to give blood through the corpus cavernosum A needle attached to a syringe was introduced from the dorsum just lateral to the dorsal vein, and in such a direction as to avoid the urethra if one went too deep Suction produced no blood, but I felt sure that the needle was in the corpus cavernosum, so blood was forced in with the syringe until over 500 c cm had been given with only slight visible *swelling of the penis The superficial vein became prominent* during the procedure and this vein also might be a possible *transfusion site* The patient recovered and no ill effects of the *transfusion were noted*

Since then I have often used the corpus cavernosum for transfusion when the superficial veins were collapsed and a rapid increase in blood-volume was required Usually no blood can be obtained when the needle is introduced and aspiration attempted This has not proved any real difficulty because if one is familiar with the anatomy of the penis it is difficult to miss the corpus cavernosum. Citrated blood is used This is introduced *by syringe because gravity* methods are too slow in the urgent cases where this route is used I have never given glucose or saline by this method and there is no doubt a risk of chronic cavernositis if irritative solutions are used.

In making the puncture the needle may be inserted into the corpus from the lateral side or it may enter from the dorsum just to one side of the dorsal vein The dorsal vein between and above the corpora and the urethra between and below them are the two structures one should guard against injuring I have *not* seen any accident or ill effects from the use of this route The fascia of the penis (Buck's fascia) *ensures* that very little swelling will take place and as the pressure increases the transfused blood passes rapidly from the corpus cavernosum into the deep and superficial dorsal veins In most instances the superficial dorsal vein becomes distended during the infusion. This vein lies outside the fascia of the penis and empties into the saphenous vein while the deep dorsal vein lies beneath the fascia and empties into the pudendal plexus

SUMMARY

The corpus cavernosum of the penis is a quickly available transfusion site of constant anatomical position which withstands repeated punctures without hæmatoma formation and does not collapse during shock It absorbs blood rapidly, is in a protected area where injury is infrequent does not bleed after transfusion and no ill effects have been noted from its use

This route is not recommended for other than blood or blood-plasma infusions

---

[1] N Deutsch med Wschr 1940, 66, 737

[2] L M and O'Neill, J F. Surg Gynec. Obstet 1941 73,

[3] el S F J Amer med Ass 1933, 100, 473

MELANOMA OF THE TONSIL

MELANOMATA do arise in sites where melanin-containing cells are not normally found but they are rare and in reporting a case of melanoma of the tonsil J. A. Del Sel and M Polak (*Rev Med Cien afines*, 1941, 3 533) say that only two others are on record A man of 57 complained that for 3 months he had noticed discomfort, not amounting to pain, in the right side of the pharynx. The right tonsil was very dark in colour but otherwise appeared normal A thickening could be felt at the level of the angle of the jaws but no individual glands were palpable A portion of the tonsil was removed for histological examination which showed that the tissue was infiltrated with melanotic cells The patient was treated by deep X-ray therapy, and after fifteen applications all sign of the tumour had vanished; but 2 months later the mass in the neck had reappeared and was larger than at the first examination and the tonsil had resumed its former appearance Further X-ray treatment was ordered as a forlorn hope.

Corrigendum.—The blood pressure of Dr Butler's patient (*Lancet* Jan. 3 p 26) at his preliminary overhaul was 140 83 mm Hg

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export

Medical News

Service Awards

The Air Force Cross has been awarded to Acting Wing Commander Thomas Conchar Macdonald, M D GLASG, R A F medical branch

The *D S C* has been awarded to the late Surgeon Lieutenant William Boyd, M B GLASG R N, H M S *Imperial*, and to Temp Surgeon Lieutenant T S Emerl, M B LPOOL, R N V R, H.M S *Afridi*, "for courage, resource, zeal and devotion to hile serving with the Home Fleet in Norwegian waters here in the spring and summer of 1940"

wing have been mentioned in dispatches Surgeon E B McDowall M B CAMB R N V R Temp ieutenant T M Adams M B EDIN, R N V R, rgeon Lieutenant P S Hawkins, M R C S, R N V R emp Surgeon Lieutenant I H Roberts, M B LPOOL, N V R

The appointments and awards made in recognition of distinguished services in the Middle East between February and July of last year include the following —

C.B E—Brigadier (temp) C arles Crawford Jones, M B BIRM, late R A M C, Colonel Joh nnes Phillip de Villiers, M D DUBL, African F, Colonel Neil Hamilton Fairley, O B E M D MELB, P, Australian M F, olonel William Wallace Stewart John D S O, M C, M D MELB Australian M F, Colonel Graham F R C S [illegible] M B LOND I M S Brigadier Kenneth Mac [illegible] C M G [illegible], Brigadier (temp) Alexander es Chambers [illegible] M R C P, South African M F, and —Major (temp Lieut Colonel) [illegible] L R C P I, late R A M C F R C P, R A M C Captain (temp Major) A Edward Rowan Boland, Captain (temp Major) I Gordon, R A M C, Ma G Fleming R A M C, Colonel) Robert Richards Leaning M R C S, R A (temp Lieut (acting Lieut Colonel) Alfred Pim M R C S, R A M C, Major (temp) Cyril Popham L R C P E R A M C Lieut Colonel Colonel Hunter West Saxby M B SYDNEY, Australian M F, Major (temp Noel Lieut-Colonel) Robert Charles Speirs, M D EDIN, E African A M C, Colonel (temp) D Stewart T D, R A M C, and Colonel Evelyn Alex Sutton M C M R C S late R A M C

M B E—Captain (temp Major) William John Gibson Barrie, M D EDIN R A M C Lieutenant C H Bone, E African A M C, Major W [illegible] M D ST AND, I M S Captain Clifford Bayard Drew M R C S, R A M C; Captain Edward Leonard Fawssett, M R C S R A M C, Lieutenant Martin Edward Meakin Herford M B BRIST R A M C, Captain Cuthbert Roy Houghton, M R C S R A M C *Captain John Brebner Morrison Milne*, M B EDIN, R A M C Captain Eric Geoffrey Morris M B CAMB, R A M C, Captain Robert Steel Morton L R C P E, R A M C, Lieut (temp Captain) Edward Pim Rigby M B LOND E African A M C, and Captain (acting Major) John Woodrow, M B CAMB, R A M C

Army Appointment

Lieut General Sir James Hartigan, M B has been appointed representative colonel commandant, R A M C, for 1942

University of London

At recent examinations the following were successful —

M D

Branch I—(*Medicine*)—Stella M Instone R D C Johnstone, A A G Lewis, C D Needham and Alec Sakula

Branch III (*Psychological Medicine*)—W L Neustatter

Branch IV (*Midwifery and Diseases of Women*) —Elsie M Torry

Branch V (*Hygiene*) —C N Faith

Royal College of Surgeons of England

The following Hunterian and Arris and Gale lectures will be delivered during January and February Jan 12, Mr F W Willway, the rôle of surgery in mental disease, Jan 14, Surgeon Rear Admiral Cecil P G Wakeley, war burns, Jan 20, Lieut -Colonel A E Hamerton, primary degeneration of the spinal cord in monkeys, Jan 21 and 22, Mr W Turner Warwick, constitution and growth of long bones, Jan 28, Surgeon Commander E R P Williams, blast effects in warfare, Jan 30, Mr Arnold Sorsby, ætiology of phlyctenular ophthalmia, Feb 3, Mr J T Chesterman, post lobectomy collapse of the lung, Feb 5, Mr N Asherson, the otogenic cerebellar abscess, with special reference to the posterior fossa cerebrospinal fluid syndrome and the operative treatment, Feb 9, Prof Francis Davies, the conducting system of the vertebrate heart, Feb 17, Squadron Leader D N Matthews, local chemotherapy in the treatment of wounds and burns, Feb 18, Dr D P Cuthbertson, aspects of the physiological reaction to injury—the post shock metabolic response, Feb 23 and 24, Dr John Beattie, physical and chemical changes in the blood associated with shock and hæmorrhage, and Feb 26, Surgeon Rear Admiral Gordon-Taylor surgical anatomy of the lower end of the common bile duct and the adjacent head of the pancreas The lectures will be held at the College, at 2 30 P M

Society of Apothecaries of London

G R Boyes, St Mary's, has completed the final examination of the society and has been granted its diploma entitling him to practise medicine, surgery and midwifery

Faculty of Radiologists

The diagnosis section of the faculty will meet at 11 A M, on Friday, Jan 16, at 32, Welbeck Street, London, W 1, when Mr A Dickson Wright will open a discussion on lesions of the intervertebral discs and Major Hugh Davies will report on a series of head injuries investigated by air encephalography On the following day at 10 15 A M, the therapy section will meet to discuss the constitutional effects of radiation with special reference to volume dose The openers w be Dr W M Levitt, Prof W V Mayneord, D SC, Dr Fra Ellis, and Ralph Phillips

Royal Society of Medicine

The section of dermatology of this society will meet o Thursday, Jan 15, at 2 P M, when clinical cases will be show On Jan 16, at 2 30 P M, Prof J M Munro Kerr will delive his presidential address to the section of obstetrics a gynæcology He will speak on progress in that speciali during the present century There will be a discussion at th same time, at the section of radiology, on avascular necr of bone which will be opened by Mr R Watson Jones and Dr J F Brailsford On Jan 17, at 10 30 A M, at a jo meeting of the sections of neurology and orthopædics, D J Purdon Martin and Mr V H Ellis will open a discus on sciatic pain Dr F A Elliott and Mr Joe Pennybak will also speak

The *paper on* the control of louse borne typhus fever i Great Britain in the light of experience in Russia, Pola Rumania and China, which was read at the section of ep demiology and state medicine on Nov 28, will be publi the December issue of the *Proceedings* of the societ limi ing the number of copies of the sectional proceedings conta are available at the editorial office of t society, 1, Wimp Street, London, W 1 (2s 6d post free)

Distribution of the llcome Medical Diary which h been delayed owing to paper strictions will begin shortl

Appointments

ATKIN, MINNIE, M B LOND, D P H asst M welfare) for Sheffield

BOTTOMLEY JANET, M B LOND, F R C S jun O (maternity an Hospital for Women

BROWN, J W F, M R C S temp asst M O H for

DAVEY, A C C M B MANC R S O at the Dreadnought H S Hospital, Greenwich

FORBATH, A, M D asst school M O for Huddersfie Glouce

FRANCIS, J E, M D DURH medical registrar at ought S amen Northern Hospital, London

GREIG, M T, M B CAMB surgical registrar at the Roy the Royal Hospital, London

GWYNNE EVANS, ERIC, M B LOND consulting ear, nose al Northern surgeon (war deputy) at King Edward Memori Ealing

SCHOLLFIELD, JOYCE, M B LPOOL asst M O for Burn and thro al Hosp

STRINGER, P R, M B LOND R S O at the Hospital for ley Consum tion and Diseases of the Chest, Brompton

Births, Marriages and Death

BIRTHS

HOWKINS—On Dec 31, at Marlborough, the wife of Sq Leader John Howkins F R C S R A F V R—a son

PEARSON—On Dec 30, at Pinner Hill, the wife of Dr Pearson—a son

MARRIAGES

GORDON—BIGGER—On Jan 3 at Walton on Thames, E George Ormond Gordon, L R C P E, surgeon lieutenant to Eileen Patricia Bigger

WOOD—HART—On Dec 18, at North Walsham, Kenneth D Wood M B, captain, R A M C, to Ann Hart

DEATHS

JAMISON—On Jan 4, at Sea Point, Capetown, Reginald B M Oxfd, F R C S, aged 63

MACLEOD—On Jan 3 at Par, Cornwall, Elizabeth Macleod, Edin

MERRALL—On Jan 3, at St Annes on Sea, Harry Merrall, Manc

NEWTON—*On Jan 5*, at Pitlochry, Charles Herdman N M B Edin, aged 51

SCOTT—On Jan 2, Maitland Scott, M B Lond, of Bourneme aged 54

WOOD—*On Dec 25*, at Bexhill on Sea George Edward Cart Wood, M D, B Sc Edin, of Overstrand Mansions, Batter Park

ORIGINAL ARTICLES

MEDICAL GRADUATION AT CAMBRIDGE

A STATISTICAL NOTE

M GREENWOOD,
D SC LOND , F R C.P , F R S

A TELEKY
PH D

In a paper by one of us and Lewis-Faning[1] a comparison was made between the wastage of medical students of London, Oxford and Cambridge Universities In the comparison "wastage" had the restricted connotation of failure to graduate in medicine in the student's university We could do no better than this because for London University students we had few and for the senior universities no data of the proportion of entrants on a medical curriculum who never qualified at all Since 1937 adequate data of the Cambridge medical school have been compiled which we have been permitted to examine These consist of the students' names and dates of birth, their home country and college, grouped by the year of matriculation from 1923 to 1938 For the students who matriculated in 1923–26 inclusive only the year of the medical qualification is shown , for the later years more details of the medical examinations and of the course of study before the medical examinations are provided

If we take the entrants of the years 1923–30, numbering 1254, and trace their careers we shall miss a few who eventually qualified, but the statistical importance of those who take more than nine years to reach the Medical Register is not likely to be great, so they may be ignored Of the 1254 medical students, 193 never qualified at all, 604 (602) graduated in medicine and also obtained a licence or some other medical qualification (the great majority of these qualifications came from the Conjoint Board), 150 (121) graduated without taking a licence, 307 never graduated in medicine but took a licence These figures include 31 students who graduated in medicine in a university other than Cambridge The figures in parentheses refer to medical graduations at Cambridge

In the paper cited it was concluded that wastage, as above defined, was of the same order of magnitude among London and Cambridge university students, about 33 3% The more exact figures now available confirm this It appears that of those Cambridge students who qualified about 24% never graduated in medicine We now have the additional information that 15% of entrants did not qualify at *all* The total wastage from the point of view of graduation is thus nearly 40% of the starters It is then about three to two in favour of a student who desires to graduate in medicine actually doing so For London we have not such precise information, but in the data used by Greenwood and Lewis-Faning relating to 425 students who had passed the second M B 26 never qualified and 149 of the 399 who did qualify did not graduate So one has for total wastage about 41%

NUMBERS GRADUATING IN MEDICINE AND NUMBERS QUALIFYING WITHIN VARIOUS PERIODS

Period from matriculation (years)	Graduating in medicine		Qualifying			
			Graduates		Non graduates	
	No	%	No	%	No	%
5– 6	3	0 4	29	4	5	1 6
6– 7	124	17 2	446	61 7	88	28 5
7– 8	171	23 7	165	22 8	86	27 8
8– 9	176	24 3	52	7 2	54	17 5
9–10	113	15 6	19	2 6	39	12 6
10–	136	18 8	12	1 7	37	12
Total	723	100	723	100	309	100

The table shows the time taken to graduate in medicine at Cambridge , 41 3% succeed within 8 years more than 33 3% take more than 9 years It also shows the distribution of time to registration , the 723 students in this part of the table is made up of 602 who took the Conjoint Board's licence as well as the degree and 121 who graduated in medicine but took no licence Less than a third of the non-graduates reached registration within 7 years, but more than twice as large a proportion of the graduates did so , of the latter only 4 3% took more than 9 years, of the former 24 6%

A LIBERAL EDUCATION

There is another comparison between the two universities which the new data allow us to make A discussion is now going on in the *Times* on the importance of a liberal education as a preliminary to the vocational training of medical students It is not a new discussion and not easily concluded because so few people agree on the definition of educational liberality In past controversies matters were easier So long as men believed that the literary remains of Greece and Rome contained all that was necessary for intellectual salvation, it was obvious that liberal education meant a scholarly knowledge of the Greek and Latin languages and literature That was the ostensible defence of those who successfully opposed admission to the fellowship of the London College of Physicians of persons not doctors of medicine of Oxford or Cambridge throughout the 18th century (see Chaplin, Medicine in England during the Reign of George III, pp 18–20) Actually it could have been argued in the 18th century that the vocational value of a knowledge of at least Latin was enormous Without it one could read none of the old and very little of the new technical literature, but when medical books ceased to be written in Latin only the cultural argument was left, and, even from the examinations of the London College of Physicians, compulsory Latin has gone But there is still a feeling that a young man or woman who has seriously studied some subject not obviously or intrinsically bound up with the technique of a profession is more liberally educated than one who has not

We shall not inquire whether one ought to feel this, but only whether, as a matter of statistical fact, the proportion of Cambridge students who are liberally educated in this particular sense is really much greater than that of London students We have no adequate data for London, but it is probably safe to assume that a statistically negligible proportion of the London medical students first graduate in any other faculty than science, and that the science graduates always take physiology or anatomy as a subject Even these latter are few

We have particulars of 648 Cambridge medical entrants of the years 1927–30 , of these 10 or 1 5% took a tripos other than the natural sciences tripos and only 6 qualified in medicine , 74 took no arts degree and 25 of these did not qualify , 357 took the natural sciences tripos, 207 an *ordinary* B A , and of these 21 and 18 respectively did not qualify

It would have been possible to make a choice of natural sciences tripos subjects not directly relevant to preclinical medical studies, but we do not find that any students have done so It follows that at Cambridge, as in London, the university training is vocational, so far as concerns the choice of subjects That this would be so might have been predicted There has indeed never been a time when a sensible proportion of the undergraduate members of Oxford or Cambridge were not poor men, but the proportion of poor medical students in the 18th century can hardly have been large At Oxford 10 years from matriculation, at Cambridge 6 were required, and the universities provided hardly any vocational training So to graduate was a long and relatively expensive business Dr Chaplin in a passage which happily combines loyalty to the London College of Physicians and caution, writes "The tendency of that education was in the direction of general culture, and accounts for the high order of intellectual capacity which was such a prominent feature of the College of Physicians in those days "

A count of the names in Munk's Roll shows that in the 18th century just under 200 persons were admitted Fellows of the London College of Physicians—not quite two a year Of these a sensible proportion had not had the advantage of that education the tendency of which was so happy, because it was not very difficult, if one had the

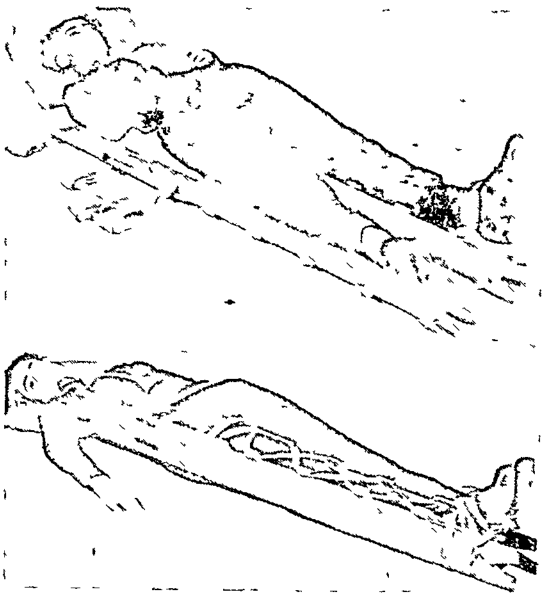
---

[1] Greenwood M and Lewis Faning *Lancet*, 1937, ii, 277

THE HAYES SPLINT

Dr. J A Kennedy Young writes

The *first-aid methods taught by the recognised* manuals for fractures or other severe injuries of the lower limbs requiring splinting leave much to be desired The application of the long external splint with its eight bandages, or the Thomas splint, is much too complicated for comparative novices Mere tying of the limbs together, which I have seen advocated for transference of the patient to a stretcher, allows too much movement of the injured limb when it is desirable to have the joints above and below the broken bone immobilised I have been interested for some time in perfecting a splint, invented by a keen first-aid worker in the Manchester district, which fulfils the requirements for support of the lower limb It is applicable to any injury of either lower limb, adequate fixed padding, and long windows in the plywood panels opposite bony prominences, ensure comfort and lightness, it can be applied by feel only in darkness and by one operator if necessary, its application is rapid and simple, and can be taught to a class of first-aid workers in half an hour



The Hayes splint Above, ready for application, below, applied

The splint (see figure) is made of two panels of plywood (the longer panel 54 in and the shorter 35 in in length), which, when in position, are somewhat flexible laterally but rigid in an anteroposterior direction The lateral flexibility permits some degree of adaptation to the curves of the body Under the padding the panels have large windows and are of convenient length (arrived at by a large number of experiments) for use on either a tall or a short person The panels are joined together by drill, the padding being held over both sides of the wood by drill envelopes The posterior cloth joining the panels is in the form of a sleeve into which extra padding may be inserted if desired The drill, being attached by four cords through eyelets, can be stripped for washing in a few minutes Wooden lugs project from each panel on which the strong bands are laced The long panel is held to the trunk at the pelvis and the chest by ties which are in long slots, allowing adjustment according to the height of the patient

The splint is laid out beside the injured limb with the four bands ready for use as shown in the upper photograph, the short panel being nearest the leg The operator kneels at the feet, facing the patient Grasping the foot of the injured leg, he applies steady traction and gently raises the limb from the ground This position is retained with the external hand and the splint pulled under the leg, the top of the connecting cloth being as near the fork as possible, the leg is then lowered and the panels are turned upright and held firmly between the operator's knees The bands to the lugs are laced criss cross as illustrated It is desirable to press the panels firmly together with one hand while lacing as far as the lugs nearest to the dorsum of the foot The bands are crossed over the dorsum of the foot and carried through both V shaped slot at the ends of the panels This applies a certain amount of traction to the leg and to some extent overcomes muscular spasm, a fruitful cause of pain The bands are then taken round both feet and tied

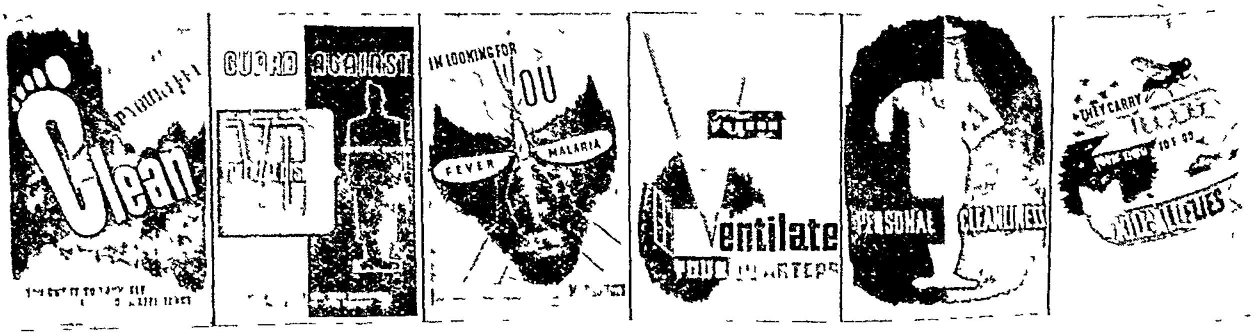
I have used the Hayes splint in two fractured femora and one compound fracture of the tibia, with the following advantages The splint was ready for use, and no delay was caused by fixing padding or bandages With the splint gripped by the knees no movement of the limb was necessary while making the splint firm In the compound fracture of the tibia I was able to see the wound and apply a sterile dressing after the splint was in position, in this case the criss-cross bands would have pressed on the injury, so the lugs nearest the wound were missed out in the lacing The rigidity imparted to the limb gave a greater degree of comfort than any first aid splint I have used The time taken in applying the splint was reduced to seven minutes, and the exposure of these shocked cases was thus considerably lessened

The Hayes splint is in my opinion an improvement on any other form of first-aid appliance for severe injuries of the lower limbs As no great degree of adroitness is required in its application it is ideal for war and air raid casualties and for accidents in mines and works where space may be very restricted It is manufactured by Wayden Ltd, Red Bank Works, Radcliffe, Lancashire

---

J - D would be glad if any reader who has used autogenous vaccine for prevention of recurrent erysipelas would give him the benefit of his experience with results

PICTORIAL HYGIENE IN THE ARMY



The War Office, not having read our peripatetic's account of how to keep the soldier clean (*Lancet*, Jan 3, p 23), have had to devise other—and more humane—methods of keeping him up to the mark Clear and clever posters have been designed, and will be hung where they catch the military eye and prod the military conscience Our small reproductions of six of them do scant justice to skilful use of text and colour There is every reason to hope that education in hygiene so ably presented will have its reward in a rising standard of health and personal pride among the men

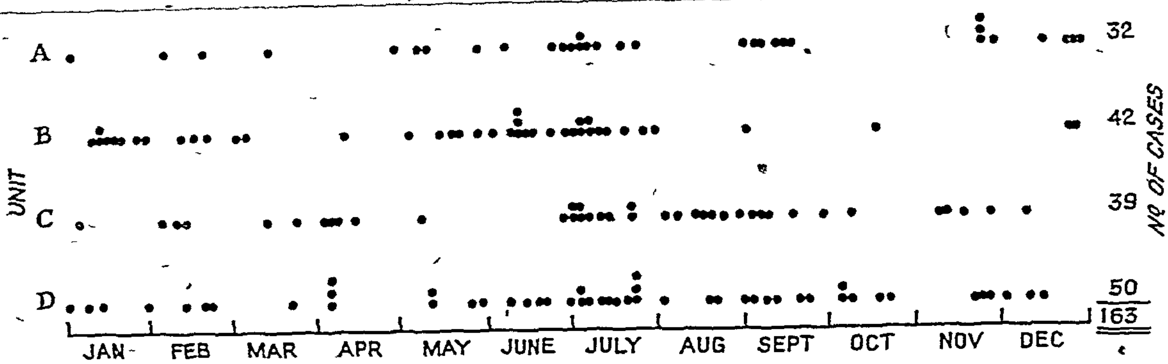


FIG 1—Distribution of thrush cases in 1940

of neonatal thrush in the hospital, an incidence of 7 2% The incidence would be much higher if all the infants developing thrush shortly after discharge could be included

A group of 60 unselected infants have been investigated by swabbing their mouths at intervals during the first 10 days of life *M albicans* was isolated from 11 (18 3%); 8 of these had clinical thrush before they were 10 days old (13 3%); the remaining 3 developed thrush after the 10th day A further 3 infants in this sample developed thrush before leaving hospital making a total of 14 cases (23 3%) It is noteworthy that all the infants from whom *M albicans* was isolated later developed thrush, and that no thrush was ever seen in infants who had recently had a negative swab It appears that once the fungus has been isolated from the mouth in these newborn infants it is only a matter of time before thrush develops In many cases, however, the lesions may be very slight and easily missed It will be observed that the incidence of thrush in this series is much greater than in the purely clinical survey This can be partly accounted for by the closer examination of the mouths of swabbed infants and by the fact that doubtful lesions, which were confirmed by a cultural check, might otherwise have been missed

Fig 1 shows the distribution of the 163 cases of thrush observed in the four obstetrical units of the hospital during 1940 The average infant populations of units A B and C were comparable while that of D was about half that of the others Unit D is the suspect and septic unit in which many of the infants are handicapped by a difficult delivery and unhealthy poorly-lactating mothers These conditions necessitate partial, if not complete, bottle-feeding for most of the infants The introduction of infection into the nursery by the infants of mothers transferred from the other units is a constant danger These facts, and a longer stay in hospital, account for the higher incidence in this unit The cases are fairly uniformly distributed throughout the year, but there is a tendency for them to occur in small groups The apparent reappearance of considerable numbers of thrush cases in unit C at the beginning of July, after a long interval, coincided with closer supervision by one of us This again illustrates the fact that many cases of thrush are missed unless a very close watch is maintained

TABLE I—INCIDENCE OF THRUSH IN INFANTS SURVIVING LONGER THAN 2 DAYS

—	No of infants	2–10 day period		2 days to time of discharge	
		With thrush	Incidence %	With thrush	Incidence %
Full term	2318	80	3 5	122	5 2
Premature	222	22	9 9	41	18 5

Incidence in special groups of infants—Table I shows the incidence of thrush in full-term and premature infants diagnosed on clinical examination Table II shows the incidence of *M albicans* in the mouth in various groups of infants as determined by swabbing and isolation of the organism These two tables again show the discrepancy between the results of purely clinical examination and one involving the isolation of the fungus Nevertheless both tables show a higher incidence in premature infants and infants that remain longer in hospital Table II shows that even among full-term breast-fed infants the incidence of infection is considerable by the 10th day of life It also shows a great increase in the incidence in bottle-fed infants which is similar in the full-term and premature groups There is no evidence here that prematurity predisposes to thrush It is clear that an infant may become infected at any time during its stay in hospital *M. albicans* has been isolated less than 24 hours after birth and, on the other hand from an infant 28 days old after three previous swabs had been negative

TABLE II—INCIDENCE OF *M albicans* IN THE MOUTH, IN VARIOUS GROUPS OF INFANTS

—		Infants	*M alb* found	Incidence %
FIRST HOSPITAL				
Premature	Bottle fed aged 1–2 weeks	27	10	37
	Same infants up to time of discharge	27	18	67
Full term, aged 8–10 days	Breast-fed	45	5	11
	Partly or wholly bottle-fed	15	6	40
SECOND HOSPITAL				
Full term aged 8–10 days	Breast fed	46	6	13
	Partly or wholly bottle fed	12	5	42

Epstein (1924) estimated that 54% of the infants between 2 and 6 weeks old in an infants' hospital were infected with *M albicans*, and Haler (1932) found the organism in 20% of infants on routine swabbing in an infants' hospital Woodruff and Hesseltine (1938) reported an incidence of thrush of about 1% in the infants of the Chicago Lying-in Hospital Our figures roughly correspond with those of Epstein and Haler but are much higher than those given by Woodruff and Hesseltine This discrepancy can, in part, be attributed to failure to detect cases in the Chicago hospital, as admitted by the authors

To determine whether the high incidence of thrush in this hospital was exceptional, 58 infants aged 8–10 days and selected at random over a period of 3 months, were swabbed orally in the nursery of another maternity hospital in Edinburgh The results obtained (table II) show a remarkable similarity to the incidence in our own hospital

CLINICAL FEATURES

The mouth of each infant is examined every morning by the sister or staff nurse of the unit and all cases of suspected thrush are reported Thorough examination of the mouths of a large number of infants requires a good deal of time and patience A good light is essential The tongue and every part of the mouth must be carefully inspected The mouth lesions may vary in size from pin-head spots to large plaques They are adherent, greyish-white, and may be surrounded by a small hyperæmic zone The greater part of the buccal mucosa may be inflamed in severe cases and the tongue may be raw red The plaques are tough and their disintegration on a slide is difficult The lesions usually *multiply* rapidly and the tongue and various parts of the mouth necessary influence, to be created a doctor of medicine of Oxford or Cambridge by Royal Mandate Of the 197 fellows it is possible that the names of 15 are still remembered by educated men who are not historians As physicians, Mead, Freind, Baker, Baillie, Heberden, Halford, as alienists, Battie and Monro, as scientists, Woodward, Jurin, Pringle and Wollaston, as writers, Arbuthnot, Akenside and Stukeley (the archæologist) Of these, Arbuthnot Woodward, Mead, Akenside and Pringle were not educated at Oxford or Cambridge Medical graduation in England was virtually restricted to those medical students who aspired to practise as what the public calls specialists or consultants, the education of general practitioners was wholly vocational We have not to lament the decline of liberal education for medical students, statistically speaking the proportion of all medical students who received a liberal education 150 years ago was as small as it is now, if by liberal education we mean serious study of any subjects having no direct vocational utility, and much smaller than it is now if we mean the broad-minded treatment of vocational studies

The pupils of the Hunters in their highly vocational school were in the way of getting an education the tendency of which was at least as happy as that of future fellows of the London College, but there were not many schools as good If pupils of our senior universities retain their traditional advantage, it will not be because their studies are less vocational than those of the less fortunate students who cannot enjoy the advantages of residence, but because there is time, when trains have not to be caught, to treat vocational subjects liberally

---

NEONATAL THRUSH
IN A MATERNITY HOSPITAL

G B Ludlam,
M B EDIN, D L O,
D T M & H
LECTURER IN THE DEPARTMENT
OF BACTERIOLOGY,
UNIVERSITY OF EDINBURGH

J L Henderson,
M D EDIN, F R C P E
LECTURER, UNIV DEPT OF CHILD
LIFE AND HEALTH ASST PÆDIATRICIAN, SIMPSON MEMORIAL
MATERNITY HOSPITAL

Thrush is universally recognised as a common disease of infancy and is generally regarded as benign The high incidence in the nurseries of many maternity and infant hospitals, and the considerable number of fatalities from the infection, are not sufficiently appreciated The following investigation on thrush in the newborn was carried out in the Simpson Memorial Maternity Pavilion of the Royal Infirmary, Edinburgh The principal objects were to demonstrate the high incidence of the disease, and some of the factors maintaining the endemicity of the infection

BACTERIOLOGICAL METHODS

Thrush is a specific infection caused by the yeast-like fungus commonly known as *Monilia albicans* The fungus produces the thrush lesion by infiltrating areas of the buccal mucous membrane with a tangled meshwork of pseudo-mycelial strands, from which clusters of yeast-like cells, known as blastospores, are formed by a process of budding In the bacteriological part of the investigation, the following methods have been used for the isolation and identification of the fungus

Collection of specimens—Specimens were taken from the mouth, hands and fæces of infants They were obtained from the mouth by swabbing in the usual way, and from the hands by vigorously rubbing a swab soaked in broth in and out of the clenched fist Fæces were collected from the napkins in sterile containers Specimens were taken from the vagina and nipples of mothers by swabbing The nipples were rubbed with a swab soaked in broth When possible a drop of colostrum was expressed and taken up at the same time Samples of pooled breast milk were also examined About 10 c cm was centrifuged, the supernatant fluid poured off and the sediment retained for cultivation Specimens were obtained from the throat and fingers of nurses by swabbing The latter specimens were obtained by vigorously rubbing a swab soaked in broth on the palmar surface of the right thumb and forefinger

Isolation and identification of M albicans—The specimens were inoculated into 1% glucose broth which was incubated at 37° C for 48 hours The supernatant fluid was then poured off and a wet preparation of the deposit examined for yeast like cells If these were present, a loopful of the deposit was plated on Sabouraud's medium and incubated at 37° C for 48 hours A typical colony was replated to ensure purity and the organism maintained on a slope of Sabouraud's medium for further examination

The organisms isolated were identified as *M. albicans* by their morphology, the appearance of the colonies after 48 hours on a Sabouraud plate, their sugar reactions and agglutination tests with a specific serum They are budding yeast like cells (blastospores) which, on corn meal agar (Benham 1931), yield also a branching mycelium which produces further blastospores in clusters On Sabouraud's medium the colonies are 1–2 mm in diameter, heaped up, circular, greyish white, creamy in consistence and have little or no mycelial fringe They emulsify easily in saline

For sugar reactions, lactose, saccharose, galactose, maltose and raffinose were used in a 1% solution in peptone water, with neutral red as indicator Each tube was inoculated with a full loopful of a 48 hour nutrient agar slope culture The tubes were incubated at 37° C for 4 days It was found that acid and gas formation had then reached a maximum and that there was a tendency for the acidity, and especially the gas, to diminish after this time The reactions of strains of *M albicans*, *M parapsilosis*, *M candida* and *M krusei* obtained from the National Collection of Type Cultures were determined by the above methods It was found that the reactions of *M albicans* were distinctive and agreed with those reported by Benham (1931), Stovall and Buboltz (1932), Martin et al (1937), and Jones and Martin (1938) The results obtained with the strains of *M albicans* isolated agreed with those from the National Collection and were as follows maltose, acid and gas, galactose and saccharose, acid only, lactose and raffinose, no acid or gas The reaction with saccharose was usually weak and sometimes doubtful Occasionally, no gas was formed from maltose but repetition of the test always gave the typical result

For agglutination reactions, Benham's method of producing antisera was followed (Benham 1931) Two 48 hour Sabouraud slope cultures were emulsified in 25 c cm of carbol saline and sterilised by incubation at 37° C for 5 days, 1 c cm, 2 c cm and 3 c cm were injected intravenously into a rabbit on 3 successive days, and this was repeated weekly for 4 weeks The rabbit was bled a week after the last dose Agglutination tests were performed with suspensions in saline of 24 hour Sabouraud cultures diluted to match a no 2 Brown's opacity standard The test was put up in agglutination tubes in the usual way and the mixtures of suspension and serum were incubated for an hour at 37° C, the tubes were then shaken vigorously and incubated for another hour, when they were shaken again and left overnight at room temperature After further shaking the result was read, the end point was taken as the last tube to show definite granularity to the naked eye There was a good deal of cross agglutination with other species of moniliæ—*M candida*, for instance, agglutinating to the same end point as *M albicans*, although not so strongly Consequently, routine agglutination was abandoned after agglutination to the end titre had been found in over 40 consecutive strains of moniliæ, which had been identified as *M albicans* by morphological and cultural appearances and by sugar reactions

In this series 193 infants have been swabbed, usually repeatedly, and *M albicans* has been isolated from 70 of them In only 2 infants have other yeast-like organisms been isolated One was infected with *M candida* and the other with a cryptococcus which was also present in the mother's vagina Neither of these infants developed any lesions It seems, therefore, that when a yeast-like organism is isolated in the newborn it will rarely be wrong to assume that it is *M albicans* if it is impracticable to carry the process of identification further

INCIDENCE

During 1940 a careful lookout was maintained for thrush, and 163 cases were observed During this period, 2540 infants survived for more than 48 hours Those who failed to do so have been excluded, since clinical thrush must be exceedingly rare before the third day of life This gives an incidence of 6 4% It is desirable, however, to calculate the incidence between the ages of 2 and 10 days, since very few infants are discharged before they are 10 days old and the proportion remaining for a longer time falls rapidly The incidence was 4 1% for this period In 1939 there were 168 cases

TABLE III—AGE AT WHICH LESIONS WERE FIRST OBSERVED IN ALL CASES SEEN DURING 1940

First 10 days	Cases	Second 10 days	Cases	After 20 days	Cases
1	0	11	12	21	4
2	1	12	6	23	2
3	1	13	8	25	1
4	3	14	8	30	2
5	5	15	2	77	1
6	16	16	1		
7	19	17	1		
8	35	18	2		
9	16	19	3		
10	19	20	4		
Totals	109		47		10

tract No oral thrush was observed during life but this is not surprising as mild cases often remain undetected The ulcer was situated about 6 in from the ileocæcal valve and was about 0 5 cm in diameter. Jejunal congestion sometimes with oozing of blood into the lumen of the bowel, is a common terminal feature It becomes less pronounced on passing down the jejunum and seldom reaches the ileum Aspiration bronchopneumonia is usually the cause of death

The thrush fungus may produce lesions in many parts of the body. Invasion of the blood-stream has been observed on several occasions Ebbs (1938) in his series of 22 cases of fatal thrush œsophagitis in older infants found numerous small pin-point ulcers in the colon in 2 cases, which he attributed to the thrush infection. The same organism had caused otitis media in 2 others while vaginitis balanitis and conjunctivitis were each seen in one instance

Microscopic examination of the lesions in the œsophagus and stomach confirms the destruction of the epithelium underlying the lesions and shows how deeply the mycelium may penetrate subjacent tissues (fig 4) The muscularis mucosæ is frequently reached In one severe case, the filaments had penetrated the muscular coat of the œsophagus almost reaching the serous surface Invasion of the submucosal lymphatics usually occurs in cases of deep penetration (fig 5) and venous invasion is occasionally seen (fig. 6) The thick pseudo-membrane which may cover the whole surface of the œsophagus in severe cases consists of polymorphs bacteria, thrush spores and epithelial debris, supported on a scaffolding of mycelium. The mucous membrane may be entirely destroyed and the pseudo-membrane adherent to the muscularis mucosæ

In the lungs thrush spores and mycelium are usually found in the pneumonic exudate associated with a mixed infection consisting chiefly of coliform bacilli and gram-positive cocci Mycelial invasion of the bronchial or lung tissues has not been detected in any of the cases of this series Occasionally, digestion of lung tissue by aspirated gastric juice is the chief histological feature.

SOURCES OF INFECTION

The infant's mouth may be a source of infection both before the appearance of thrush and after recovery from thrush. In our group of 60 unselected infants swabbed at intervals during the first 10 days of life *M albicans* was isolated from 11 Every infant harbouring the organism developed thrush between 2 and 8 days later. In one case it was possible to fix the incubation period with some certainty, as the organism was isolated on the 1st day of life and thrush developed on the 5th day. A group of 10 infants were swabbed after the lesions had disappeared In 8 of these the organism could still be isolated in one of the remaining infants a negative swab was obtained after the disappearance of thrush, but the organism was isolated after another 4 days In the other, with a negative swab, the moniliæ had been isolated 4 days before the thrush appeared but could not be isolated when the thrush was present or 4 days after its disappearance The negative results can be ascribed to routine treatment with 1% gentian violet in aqueous solution The organism appears to survive for the duration of the infant's stay in hospital in most cases *M albicans* was isolated 7 weeks after the disappearance of thrush in one instance and 3 weeks afterwards in another. *It seems however that the isolation of the organism from an infant that has recovered from thrush does not necessarily imply the onset of thrush in a few days' time as it does in a recently infected infant.*

TABLE V—RELATION OF ORAL TO FÆCAL MONILIASIS

—	Cases	M alb in fæces
Thrush present	4	4
M alb in mouth but no thrush	7	4
No *M alb* in mouth	9	0

The infant's fæces —The stools of 20 infants have been examined for *M albicans*, the results (table v) show a highly significant relationship between the presence of the organism in the fæces and in the mouth. The fungus can evidently pass through the alimentary canal and be excreted in a viable condition

The infant's hands —It seemed possible that the infant's hands might become infected from nurses or fomites and the infection be passed to the mouth A series of swabs was taken from the hands and mouth simultaneously to determine whether the organism could

TABLE IV—PRINCIPAL PATHOLOGICAL FEATURES IN 20 CASES OF THRUSH ŒSOPHAGITIS IN WHICH THE INFANTS DIED

Case	Birth weight lb	Birth weight oz	Age when oral thrush first detected (days)	Age at death (days)	Degree of œsophageal thrush	Thrush of stomach	Bronchopneumonia	Other conditions	Cause of death
							MATURE INFANTS		
1	9	9	6	10	++		+*		Thrush
2	8	4	10	12	+		+	Omphalitis and septicæmia (strep)	Septicæmia
3	7	8	8	15	+++		—	Septicæmia (staph.)	"
4	6	11	15	17	++	+	+	Jejunal and ileal congestion	Thrush
5	6	6	8	9	+++	+	+	Epidemic bronchitis Jejunal congestion	
6	5	14	7	35	+		+	Intermittent volvulus	Volvulus
7	5	10	4	10	+++		+	—	Thrush
8	5	9	9	15	++		+	—	"
							PREMATURE INFANTS		
9	5	7	No record	14	++		+	Jejunal congestion	Thrush
10	5	0	15	31	+++		+	—	"
11	4	14	8	14	++		+	Jejunal congestion and hæmorrhage	
12	4	10	No record	15	+		+	Meningeal sinus thrombosis	Sinus thrombosis
13	4	4	8	9	+		—	—	Thrush
14	4	2	No record	15	+		+	—	
15	4	2	7	8	++		+	Epidemic gastro-enteritis	Gastro-enteritis
16	4	1	12	17	+++	+	+	Generalised œdema Jejunal congestion	Thrush
17	3	14	8	11	++		—	Jejunal congestion	
18	3	13	No record	4	+		+*	Intraventricular hæmorrhage	Cerebral hæmorrhage
19	3	12	7	12	+		+	Subdural hæmorrhage	Thrush
20	3	10	No record	15	+++	+	—	Intraventricular hæmorrhage	"

* Staphylococcal

may become thickly coated within 24 hours of their initial appearance. Occasionally we have observed the spontaneous recovery of infants with only a few very small lesions within a day or two.

The mouths of 100 infants with thrush were examined by one of us over a period of 6 months and the distribution noted at the first examination; the tongue was affected in 87, the palate in 66, the cheeks in 51 and the lips in 48. In half the cases three or four parts of the mouth were affected. Labial lesions are often associated with others on the contiguous part of the gums, but lesions are seldom seen on the under surface of the tongue or the floor of the mouth except in severe cases. The incidence of pharyngeal involvement can only be determined in fatal cases.

Differential diagnosis.—Thrush is often mistaken for regurgitated milk curds or furring of the tongue. Milk curds, unlike thrush colonies, are not adherent and are easily rubbed off. Furring of the tongue is common in the newborn and is often remarkably transient. The colour is usually greyish and the distribution uniform. The coexistence of furring and thrush may cause difficulty, but thrush should always be suspected where the tongue has a granular coating. Involvement of the lingual edges, on which furring is never seen, or the presence of thrush lesions in other parts of the mouth, will dispel any doubt. Small, whitish, fibrous nodules in the hard palate are normally found in many newborn infants and must always be borne in mind. They are usually situated in the median raphe. The presence of the organism can easily be detected by microscopic examination of a fresh scraping teased in a drop of water, but it stands out much more clearly if the scraping is mounted in 10% potassium hydroxide (fig 2) or methylene-blue. Potassium hydroxide clears the preparation of cellular debris; Methylene-blue stains the epithelial cells and other organisms but leaves the thrush fungus unstained. The demonstration of the organism by staining dried films by Gram's method is more laborious and need not be employed.

The age at onset is shown graphically in fig 3. It will be observed that only one infant displayed the lesions as early as the 3rd day of life, and that very few cases occurred before the age of 6 days. A rapid rise to a peak at 8 days is followed by a sharp fall. The sharp fall in the incidence after the 8th day can be accounted for by the great reduction in the proportion of infants receiving bottle-feeding after the adequate establishment of lactation at 3–5 days. It was customary at the time of the investigation for all infants to be offered a solution of 5% dextrimaltose in sterile water by bottle during the first few days. Very few infants are discharged before they are 10 days old, but the proportion remaining for a longer time falls rapidly, thus rendering the figures for the age-incidence in older infants incomparable (table III).

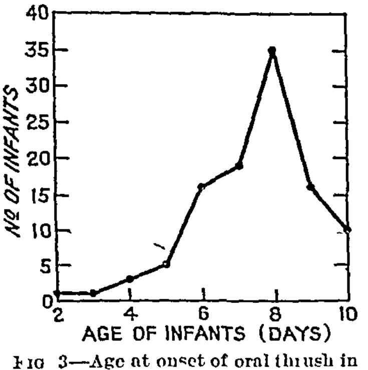


FIG 3—Age at onset of oral thrush in 106 infants.

CLINICAL EFFECTS

Oral thrush.—Unless extensive, oral thrush does not usually produce harmful effects in mature infants, but in premature infants it often interferes with the appetite and is more likely to have serious consequences. In severe cases with stomatitis the pain on sucking and swallowing renders adequate feeding and nutrition difficult. Ulceration of the buccal mucosa occasionally occurs in these circumstances and pyogenic infection may supervene, as in the following fatal case.

Birth weight of infant 6½ lb. Fed on unsweetened condensed milk from birth. Progress satisfactory until the 10th day when oral thrush appeared. Involvement of the whole of the buccal cavity with acute inflammation of the mucosa soon followed. This caused complete anorexia and necessitated tube feeding. The oral thrush had almost cleared up within a week with the use of 1% gentian violet in aqueous solution twice daily, but an inflamed mucosa with many suppurating ulcers remained. The baby died a few days later. Autopsy showed that the oral condition and its toxæmic effects had been the cause of death. The fungus had not spread to the pharynx or œsophagus.

Œsophageal thrush.—The occurrence of severe anorexia in a case of oral thrush without much inflammation should always arouse the suspicion of œsophageal involvement, although such a diagnosis cannot be made with certainty. Such a complete degree of anorexia, due to any other obscure condition, is rare in infants who have previously fed satisfactorily. Œsophageal thrush sometimes develops where the oral lesions have been inconspicuous enough to be missed on routine examination of the mouth. This occurred in 3 of the 20 cases of œsophageal thrush summarised in table IV. In 2 further cases, no oral lesions were detected either before death or at autopsy. A provisional diagnosis of thrush œsophagitis is rarely made in such cases, but the *condition should always be considered and the fungus* looked for in the gastric contents or stools. A pronounced monocytosis is often found in severe cases, and in these persistent regurgitation or vomiting are conspicuous features. In the latter part of the illness, loose mucoid, greenish stools, indicating the presence of enteritis, and signs of bronchopneumonia, make their appearance.

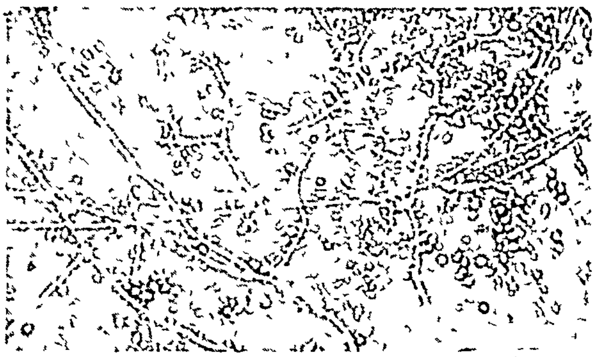


FIG 2—Scraping from an oral thrush lesion cleared in 10% potassium hydroxide. Shows pseudo mycelium and blastospores. (× 300.)

PATHOLOGY

Of the 163 infants in our series 20 died from various causes. An autopsy was done in 18 cases and the thrush fungus was found to have spread to the pharynx in 8; in 7 of these 8 it had also invaded the œsophagus. The infection had spread to the stomach in 2 cases. During the last four years, 20 cases of thrush œsophagitis have been discovered at autopsy in this hospital. The incidence in infants who died after 18 hours of life was 6·6%. It appeared to be the cause of death in 13 cases. Approximately a quarter of the cases of thrush occurring in this hospital are premature; but three-fifths of the fatal cases with thrush œsophagitis were premature (table IV). If all the fatal cases of thrush œsophagitis resulting from infection in the hospital were known, the incidence would be considerably higher.

In mild cases of pharyngeal and œsophageal thrush the lesions may not be numerous but tend to appear in groups. As elsewhere, they are adherent and associated with some congestion of the mucosa. In severe cases the lesions become confluent, with the formation of plaques and extensive subjacent ulceration. Acute inflammation of the entire mucous membrane of the affected organ occurs in such cases. In the pharynx the pyriform recesses are usually the most severely affected part, while in the œsophagus the narrowest parts are usually the first involved. In severe cases the œsophagus may be completely lined with a thick pseudomembrane. Similar lesions were seen in the four cases with gastric involvement, but the intervention of death seldom allows the process to advance so far in the stomach. No intestinal lesions were found in this series of 20 cases. Recently, however, a mycotic ulcer was found in the ileum of a premature infant aged 7 weeks in whom no other signs of thrush were seen in the alimentary

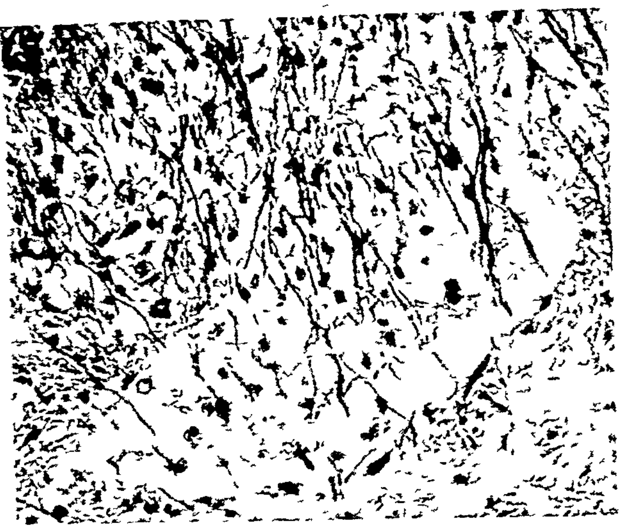


FIG 5—Œsophagus, showing the invasion of a submucosal lymphatic by mycelial strands Stained gram and neutral red (× 375)

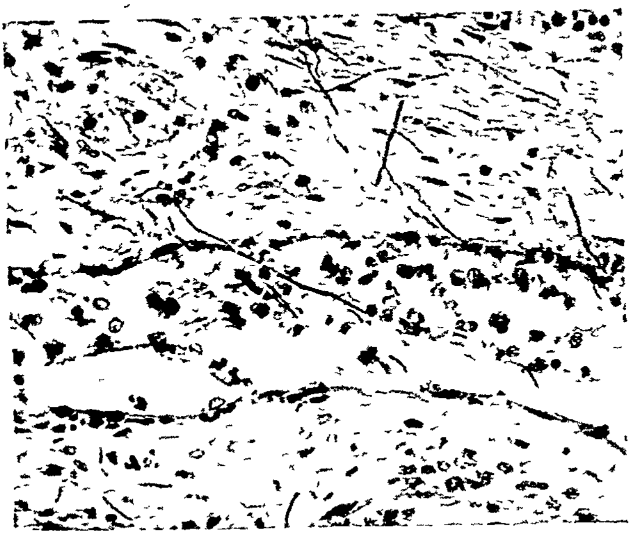


FIG 6—Stomach showing the invasion of a vein in the mucous membrane by filaments of the thrush fungus Stained gram and neutral red (× 375)

air-borne infection is an important factor in the spread of thrush

PROPHYLAXIS

The impression that trauma of the buccal mucosa predisposes to thrush is still widely held We have not been able to adduce any evidence in support of this conception In a group of healthy infants it has been shown that thrush developed within a few days in every infant from whom *M albicans* had been isolated The introduction of the organism into the mouth may not always cause thrush but it appears to do so in the great majority of cases This is not surprising when one recalls th efact that conditions in the mouth of the young infant favour the growth of the thrush fungus The principal reasons for this are the acidity of the saliva and the use of fermentable sugars in artificial feeds The saliva of infants in the first few weeks has a higher acidity than it any other time of life The normal pH in the neonatal period is about 5 2 (Thomson 1941), which approximates closely to the optimum pH for the thrush fungus Sucrose, dextrimaltose and glucose are often used in artificial feeds instead of lactose which is more expensive, but, unlike lactose, they are all fermented by the thrush fungus Yet the use of lactose does not seem to influence, appreciably, the incidence of oral thrush in the nurseries

Early diagnosis is one of the most effective ways of preventing the dissemination of infection In our experience, many cases of thrush remain undiagnosed until the mouth becomes severely affected The principal causes of this delay are the difficulty in examining an infant's mouth thoroughly, ignorance of the clinical features of the disease, and uncertainty about the differential diagnosis in the early stages The prevalent belief among nurses that thrush is a "disease of dirt," and its occurrence a stigma on a nurse's work, is unfortunate, for it often causes some reluctance to admit the presence of the condition While there is an element of truth in this conception, we wish to emphasise that the disease may flourish where there is a good standard of ordinary cleanliness Its control depends on much the same factors as control of the dysenteric diseases and requires an equally high standard of nursing technique

The infectivity of infants is greatest when patches of thrush are present and the monilial cells are most numerous The organisms are less numerous during the incubation period and after the disappearance of the lesions If the thrush is thoroughly treated as soon as it is detected, the infectivity of the mouth will be greatly diminished, and early isolation of the infant will prevent spread of infection at the most infectious period After the thrush has been cured, isolation should be maintained until the infant's discharge from hospital, or until a negative swab is obtained, as the organism usually persists in the mouth until discharge It has been demonstrated how an infant with oral moniliasis may infect its clothes and anything with which it makes contact, by means of its hands, regurgitated matter, vomitus and fæces The hands of a nurse tending such an infant can scarcely fail to become infected with moniliæ The much higher incidence of thrush in bottle-fed infants can be accounted for by contamination of the feeding utensils with moniliæ from nurses' hands and by the greater amount of handling

A mother may infect her infant from the vagina during birth or from the nipple when it is fed We have shown that only a small proportion of the cases of thrush in this hospital can be attributed to these modes of infection. A mother is much more likely to be a medium of infection than the source for if her breast-fed infant should harbour moniliæ in its mouth her nipples will become infected, and if her surplus milk is added to the pool it will probably carry the organism and thus disseminate the infection The routine boiling of pooled breast-milk to eliminate this likely channel of infection is, therefore, essential Although elimination of the spread of the infection by a very efficient nursing technique would effect a great reduction in the incidence of the disease, a few sporadic cases might still be expected from infection in the mother's vagina, and perhaps from pharyngeal and fæcal monilial carriers among nurses and mothers

Low resistance is the principal cause of the high morbidity-rate from infection in the early weeks of life Organisms which cease to be a serious menace after the first few weeks, such as coliform bacilli and *M albicans*, account for much of the morbidity and mortality from infection in the neonatal period Although it is generally conceded that young infants run great risks from infection in maternity and infants' hospitals, adequate preventive measures have not been seriously undertaken in this country Experience has taught us that a low rate of neonatal infection in maternity hospitals can only be maintained by making cross-infection virtually impossible In many maternity hospitals at the present time the maintenance of a uniformly high standard of barrier nursing in nurseries seems to us impracticable for the following reasons

1 The proportion of the available space allotted to the nurseries in many maternity hospitals is ridiculously small The resultant overcrowding facilitates cross infection and renders efficient barrier nursing impossible

2 Nursery staffing usually proves to be inadequate when the number of patients exceeds the average When extra work has to be done in the same time, the inevitable result is a breakdown in the rigid routine

3 Although qualified in general nursing, most nurses in the principal maternity hospitals are pupil midwives who are inexperienced in the care of infants

4 The inexperienced fail to realise how apparently trivial infections may be disastrous in the newborn They often

ever be isolated from the hands before the mouth No evidence of this was found Negative mouth swabs were associated with negative hand swabs in 11 instances, but 9 out of 18 infants with positive mouth swabs had positive hand swabs These results show that an infant with an infected mouth may readily spread the infection to objects within reach of its hands

The nurse —It appears to be unusual for the skin to harbour *M albicans* except in definite monilial lesions Benham and Hopkins (1933) were unable to isolate *M albicans* from the fingers of 100 adults, although it was found in the alimentary canal of 18 of them Other workers have found the organism in the apparently healthy adult throat Todd (1937) isolated it from the mouth or throat of 14% of 1000 adults It seems possible, therefore, that at least a few cases of thrush may be caused by infection from the throat of the mother or nurse Throat swabs of 60 nurses were examined for *M albicans*, 20 (33%) gave a positive result This high incidence may possibly be the result of infection of the nurses from the infants Masks are worn during ward-work, so that droplet infection from the nurse's throat should be rare Contamination of her hands from her throat is perhaps more likely The fingers of 42 nurses were swabbed, usually when bottle-feeding infants, and *M albicans* was isolated 3 times Recollection of the greater amount of handling of bottle-fed infants will emphasise the significance of this experiment, particularly as the contamination of the hands is probably transient It shows that infection of the hands of nurses on nursery duty with this organism is common

The mother —Since Haussmann (1875) reported fungus spores in the mouths of newborn infants whose mothers were suffering from a fungal vaginitis a number of workers have stressed the possibility of infants being infected in this way

Woodruff and Hesseltine (1938) give a useful review of the relevant literature Witkowski (1935) has shown that, in general, the oral flora, shortly after birth, resembles that of the vagina Hesseltine et al (1934) produced oral thrush with pure cultures of vaginal moniliæ This has been confirmed by Bland et al (1937) Woodruff and Hesseltine (1938) found an incidence of thrush of 21% among the infants of mothers with vaginal mycosis, compared with about 1% for the general infant population of the hospital Liston and Cruickshank (1940), working in the antenatal department of this hospital, found that 25% of the women attending a leucorrhœa clinic were suffering from vaginal thrush

To determine to what extent vaginal infection may be responsible for the high incidence of thrush in this hospital, the vagina was swabbed in 50 unselected women during the first stage of labour The infants' mouths were swabbed on the first day, the fourth or fifth day and the seventh or eighth day Table VI shows that 20% of the women had a vaginal infection but that there was no significant difference in the incidence of infection between their infants and those of the control group It is clear that not more than 2 out of the 7 cases of monilial infection could have resulted from contamination from the vagina In one of these 2 cases the organism was isolated on the first day of life and it seems probable that this case, at least, was caused by vaginal infection Bland et al (1937) have noted monilial lesions of the nipples and adjoining part of the breast in women with vaginal mycosis Such lesions, presumably, could produce thrush in the infant, but as they do not appear to be common they could only cause occasional cases The nipples of 42 of the above women were swabbed before the infant had been put to the breast, to avoid contamination of them by the infant No moniliæ were isolated This site, therefore, seems to be an almost negligible source of infection

TABLE VI—RELATION OF ORAL MONILIASIS IN THE INFANT TO VAGINAL MONILIASIS IN THE MOTHER

—	Cases	*M alb* in infant's mouth in first 8 days
M alb in mother's vagina	10	2
No *M alb* ,, ,, ,,	40	5

TABLE VII—INCIDENCE OF ORAL MONILIASIS BEFORE AND AFTER BOILING POOLED BREAST-MILK

—	No of infants (premature)	*M alb* present	Incidence %
Milk unboiled	21	18	86
Milk boiled			
(*a*) approx 2 months after boiling was begun	32	21	66
(*b*) approx 10 months after boiling was begun	22	9	41

Pooled breast-milk —It is the routine in the hospital to pool the breast-milk of those mothers who have an excess, or are unable to feed their infants directly from the breast This milk is given to most of the bottle fed infants, and nearly all the premature infants are fed in this way In the earlier part of the investigation it was not boiled Attempts were made to culture the organism from samples of this unboiled pooled milk, for it was considered likely that milk contributed to the pool by a woman nursing an infant with thrush would become infected from her nipples It was isolated in 3 out of 10 samples taken at weekly intervals Since boiling destroys the organism in a few seconds it was hoped that routine boiling of the pooled breast-milk would lead to a definite fall in the incidence of infection Table VII shows the incidence of infection among premature infants before and after the milk was boiled There is a highly significant difference between the first and third groups of infants, suggesting that the boiling may have lowered the incidence of infection Nevertheless, it is clear that the infection is still very common and that there are other important methods of spread

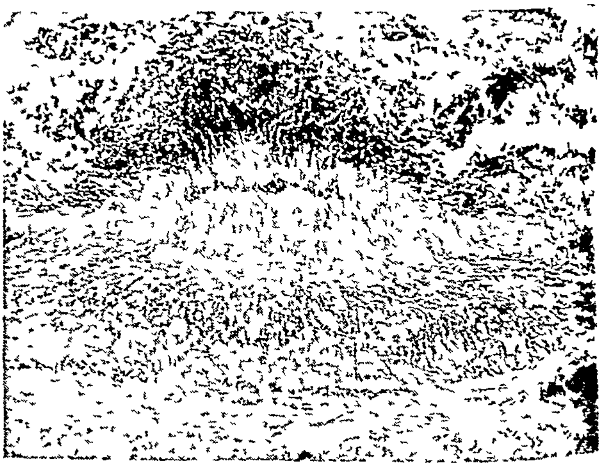


FIG 4—Section of an œsophageal thrush lesion from case 4 showing the raised lesion, the ulcerated epithelium and the filaments diverging and penetrating almost to the muscular coat Stained gram and neutral red (× 50)

Air-borne infection —The capacity of an infant to produce infected droplets, when screaming, has been tested by incubating a blood-agar plate that had been held 6–8 in from the mouth while the infant screamed 50 times This investigation has been carried out with 12 infants An average of less than 1 colony per infant has been obtained Experiments have also been carried out to determine how often *M albicans* could be isolated from the air of the nurseries, 17 Sabouraud agar plates were exposed in the nurseries and 6 in the changing rooms for 4 hours The plates were then incubated at 37° C for 48 hours in a moist chamber All suspicious colonies were filmed, and colonies of yeast-like organisms were examined further by the methods already described The only plate on which a colony of *M albicans* was found had been exposed in a changing room Another 6 plates of Sabouraud broth were exposed in the nurseries for 18 hours The broth was then made up to its original volume with sterile water and incubated for 48 hours *M albicans* could not be isolated from any of these plates These experiments provide no evidence that damage was examined At the level of the punctured wound the profundus tendon and the ulnar slip of the sublimis had been completely torn the distal fragments were small The intact radial half of sublimis was slightly adherent posteriorly and it was easily mobilised One layer of amnioplastin was inserted deep to the tendon and another laid on its superficial surface The skin was closed with silk sutures and the finger firmly bandaged before removing the tourniquet A light plaster-of-paris splint held the finger in slight flexion.

There was slight reddening of the skin edges for a few days after operation, otherwise healing was uneventful and active movement was begun after two weeks Six weeks after operation the finger appeared normal and power had improved so much that he could use this finger for playing the piano There was no impairment of sensation and full passive movement Active movement at the m p joint was full, at the proximal i p joint 180°–160° and at the distal i p joint nil Three months after operation, power had further improved and active movement at the proximal i p joint had increased to 180°–150° The scar was supple and there was no evidence of adhesions in the deep tissues The wasting of soft tissues was much less

CASE 2

On Jan 1, 1941 a lad of 15 caught his right little finger in a machine at work and sustained an oblique laceration of almost the whole volar surface, as far as the base of the terminal phalanx There was gross contamination and the profundus tendon was ruptured at the distal i p joint Under general anæsthesia and tourniquet debridement was carried out and the wound treated by the Winnett Orr method Only slight infection developed and healing was complete in four weeks At that time movement at the m p joint was full, at the proximal i p joint 180°–120°, at the distal i p joint nil Power was poor He was given a course of wax baths and exercises and two weeks later, while power had improved, movement was limited to m p joint full, proximal i p 150°–90° At this stage he went back to work and was not seen again until five months after the accident, when the little finger was found to be acutely flexed by dense scar tissue

On June 28, under general anæsthesia and tourniquet, the scar was excised and found to involve the anterior wall of the digital sheath and the digital nerves Tendon and nerves were dissected free The tendon was not adherent to the posterior wall of the sheath and moved freely, but full extension was limited by tension of the tendon The range of extension was increased by flexing the wrist Amnioplastin was applied round the tendons and nerves, sulphanilamide powder sprayed in the wound and a full thickness graft from the right thigh applied and sutured in position The finger was splinted in extension and a short course of sulphanilamide given by mouth (gr 7½ t d s for three days) The wound was quite clean when examined after five days and the graft seemed to be taking, but ten days later there was a slight discharge of sero pus round the edges and some crusting The infection was clear in two weeks and wax baths and active exercises were begun Potassium iodide ionisation was given later and the finger kept splinted at night

Three months after the second operation, power in the finger was good but the graft had become partially fibrosed, producing a contracture which interfered with the patient's power of gripping tools at work Movement at the joints was now m.p 180°–100°, proximal i p 135°–90° The terminal i p joint was straight and immobile The scar tissue did not seem to be adherent to the underlying tendon On Aug 22, under general anæsthesia and tourniquet, the scar was again excised The amnioplastin was still present as a thin transparent gelatinous membrane from which the scar tissue was easily separated Through it the tendon could be seen moving freely and the finger could now be straightened almost completely The tourniquet was loosened for a moment and some bleeding occurred at the margins of the amnioplastin, showing that it was being vascularised. The wound margins were soft except at the distal end, where the soft tissues were tacked down to bone These tissues were dissected free and small piece of amnioplastin tucked underneath Sulphanilamide powder was sprayed in the wound and a full thickness graft from the abdomen was applied and stitched in position The finger was splinted in extension and sulphanilamide (gr 7½ t d s) given by mouth for three days

Slight sepsis occurred at the distal end but soon cleared up, and again there was some fibrosis of the graft, mainly at the edges Wax baths active exercises, potassium iodide ionisation and night splinting were all given Two months after the last operation he had good power in the finger, and full movement at the m p and proximal i p joints There was no evidence of adhesion between the graft and the tendon and sensation in the finger was normal

CASE 3

In February, 1941, a woman of 42 had a suppurative tenosynovitis of the flexor tendons of the left middle finger, spreading to involve the ulnar bursa, thenar and mid-palmar spaces Healing was complete at the end of April and a course of wax baths and exercises was given When seen in June she had partial stiffness of all the fingers, of which the middle finger was the most troublesome because it was very stiff and flexed by scar tissue The finger was wasted and there was a firm scar down the middle of the volar surface extending proximally well into the palm Though sensation was normal there was little power in the finger and movements at the joints were m p 165°–150°, proximal i p 150°–145°, and distal i p 180°–175° X ray showed some decalcification, but the joints were clear

On June 24, under general anæsthesia and tourniquet, the scar on the middle finger and distal part of palm was excised In place of the anterior sheath wall there was a dense band of fibrous tissue binding the tendons down, and when this was removed both tendons moved freely The finger could not be straightened, however, and the obstruction seemed to be in the interphalangeal joints Gentle manipulation of the joints was carried out Unfortunately the limits of passive movement were not recorded at the time but there seemed to be about half the normal range Amnioplastin was applied round the tendons and the skin sutured with silk. There was a small skin defect at the proximal end of the finger and this was covered with a full thickness graft from the thigh and sutured in position The finger was splinted in the position of fullest possible extension and sulphanilamide (gr 7½ t d s) given by mouth for three days There was slight localised sepsis for a few days round the graft but in ten days healing was complete and wax baths and exercises were begun

Power and mobility have steadily increased and on Oct 18 power was good, movement at the joints was m p 165°–110°, proximal i p 180°–110°, and distal i p 180°–160° There was no adhesion of the scar to the deep tissues but the graft was partially fibrosed The wasting showed definite improvement

CASE 4

In January, 1941, a woman of 53 had a severe pulp infection of the left thumb which spread to cause necrosis of most of the terminal phalanx; tenosynovitis of the flexor tendons and a small abscess in the thenar space After incision and drainage the tendon was said to have sloughed When seen in May, the finger had healed and there was a dense inverted scar down the middle of the volar surface, extending on to the thenar muscles There was slight movement at the m p joint and none at the i p joint Wax baths and active exercises improved the power but there was no increase in movement and gripping was feeble X ray showed the destruction of most of the terminal phalanx and i p joint The m p joint was clear

On Aug 18, under general anæsthesia and tourniquet, the scar was excised and a few remnants of flexor pollicis longus tendon found firmly bound down by scar tissue The scar tissue was removed and the tendon mobilised About 30° movement was now possible at the m p joint Amnioplastin was placed deep and superficial to the tendon and sulphanilamide sprayed in the wound. The skin was closed with silk sutures Sulphanilamide (gr 7½ t d s) was given by mouth for three days

Healing was uneventful and movement was begun in twelve days Three weeks after operation power in the thumb had much improved, especially in opposition Movement at the m p joint was 170°–135° After two months the range of movement was the same but power had increased The scar was not adherent to the deep tissues There was a decided increase in subcutaneous tissues, giving the thumb a much less scarred and wasted appearance

DISCUSSION

Each of these patients complained of a stiff and useless finger The cause of the stiffness was complex and varied in each case but the main factors were . (1) peritendinous adhesions , (2) periarticular adhesions , and (3) scarring and contracture of the superficial tissues In addition partial tendon loss accounted for some of the weakness.

regard extreme care, the necessity for which is too often only associated with operating-theatres (McNeil 1940), as unnecessary fussiness

5 In the course of their training these nurses are frequently transferred from one unit to another, which necessitates frequent changes in the nursery staff The nursing routine is much more likely to break down with beginners than with a more permanent staff

Although dispersal of infants in small units with or near their mothers would facilitate efficient barrier nursing and greatly reduce the spread of infection, cubicle nursing appears to be the ideal method The material barrier is a constant reminder of the necessity for care and renders a routine much easier to carry out efficiently, while the entire nursing of an infant within its own cubicle greatly diminishes the possibility of cross-infection Cubicle nursing has been instituted in some maternity hospitals in the U S A with great success (Cron et al 1940) It has greatly reduced the incidence of infection and eliminated epidemics of gastro-enteritis, the most deadly of all neonatal infections We realise that this method of nursing requires a larger nursing staff, but no obstacle should be insurmountable when the sure reward would be the saving of many hundreds of newborn infants who die from preventable infection in the maternity hospitals of this country every year

CONCLUSIONS

A high incidence of thrush has been found on routine clinical examination of the infants in a maternity hospital Closer observation, especially when accompanied by bacteriological examination, gave a much higher incidence, showing that many cases of thrush were being missed The incidence was much higher in bottle-fed infants and infants remaining a long time in hospital These factors account for the very high incidence in premature infants There was no evidence that local trauma, debility or prematurity predisposed to thrush The distribution of cases during the year was fairly uniform, but there was a tendency for cases to occur in small groups A similar incidence has been found in another maternity hospital

The causal organism, *Monilia albicans*, can be isolated several days before the onset of the lesions It usually persists after the lesions have disappeared, but this may be prevented by efficient local treatment Isolation must, therefore, continue until discharge, unless a negative swab has been obtained *M albicans* can be isolated from the fæces of most infants with oral infection and also from the hands of 50% of infected infants

Although *M albicans* was not uncommonly found in the mother's vagina, there was no significant relationship between vaginal infection and infection in the infant This is probably due to any relationship being overshadowed by more important sources of infection

M albicans was isolated from the throat in a third of the nurses and was found on the fingers of a few Thus the nurse is important as a potential source of infection The organism was found in a high proportion of samples of pooled breast-milk used for bottle-fed infants There was a fall in the incidence of thrush after heating of this milk was adopted, but it still remained high

The principal causes of the high incidence of thrush are . overcrowding in the nurseries , failure of the present nursing technique to prevent spread from infant to infant and failure to make an early diagnosis with resultant delay in isolation and treatment The use of unheated, pooled breast-milk is also a factor in the spread of infection Air-borne infection appears to be of little or no importance

We wish to thank Prof Charles McNeil and Prof T J Mackie for their advice , Prof R W Johnstone and the obstetrical and nursing staffs of the Simpson Memorial Maternity Pavilion of the Royal Infirmary, Edinburgh, and Dr Margaret Martin and the obstetrical staff of the Elsie Inglis Memorial Maternity Hospital, Edinburgh, for their help , Dr Agnes Macgregor for the pathological reports on the fatal cases and Mr T C Dodds for the illustrations Laboratory expenses have been met by a grant from the Earl of Moray's Endowment Fund of Edinburgh University

References at foot of next column

AMNIOPLASTIN FOR ADHERENT DIGITAL FLEXOR TENDONS

M C PINKERTON, M B EDIN
CASUALTY OFFICER AT REDHILL COUNTY HOSPITAL (M O C), EDGWARE

ADHESIONS between the digital flexor tendons and their sheaths commonly cause stiffness of the affected fingers after suppurative tenosynovitis, suture of cut tendons, severe burns of hand and even long disuse When adhesions are slight they may be broken down by such physiotherapeutic methods as wax baths, active exercises, potassium-iodide ionisation and manipulation Dense adhesions cause severe disability, often necessitating amputation of the affected finger After suppurative tenosynovitis the adhesions are usually dense and there is a variable amount of tendon slough In most cases the finger is crippled Little has been written about attempts to mobilise such fingers, but Penfield, Humphreys and Chao (1940), and Kohnstam (1941) have suggested the use of " amnioplastin " in the prevention of adhesions round injured tendons

Human amnion is a fine membrane composed of a few layers of mesenchymal stroma covered by a single layer of entoderm From it amnioplastin is prepared by the method of Penfield, Humphreys and Chao (1940), and Penfield (1940)—washing the membrane to remove all blood and mucus, immersing it in 70% alcohol, drying it in sheets, and sterilising it by boiling for 20 min in distilled water It is then washed in sterile normal saline in which it is kept for 20–30 min before use The final product is a thin, acellular, transparent pliable membrane Using amnioplastin in experimental brain wounds in cats, Penfield and his colleagues were successful in preventing adhesions, and the results in their human cases have so far been good Lambert Rogers (1941) has reported successful results with it in the treatment of peripheral nerve injuries, while Law and Philip (1941) reported its use as a conjunctival graft The object of this paper is to illustrate the use of amnioplastin in mobilising tendons fixed by adhesions following sheath infection

CASE 1

A scientific glass blower reported on April 22, 1941, a week after injuring his left ring finger at work An instrument had caused a punctured wound in the centre of the volar surface at the level of the neck of the proximal phalanx A few days later he had wrenched the finger while alighting from a tram The finger had been dressed at work and a thin discharge had been noted for a few days The wound was found to be healed and there was no inflammatory reaction Passive movement at the metacarpo phalangeal (m p) and interphalangeal (i p) joints was full , active movement at the m p joint was full, at the proximal i p joint 180°–165° and at the distal i p joint nil The power of flexion was very weak Slight wasting of all the soft tissues was apparent

On May 5, a general anæsthetic was given and a small rubber tourniquet applied at the proximal end of the ring finger The damaged tendons were exposed by an antero lateral incision on the ulnar side and it was found that the anterior wall of the sheath was reddened and adherent to the tendons for almost an inch distal to the original wound When the scarred sheath was removed the extent of tendon

---

DRS LUDLAM AND HENDERSON REFERENCES
Benham, R W (1931) *J infect Dis* 49, 183
— and Hopkins A McH (1933) *Arch Derm Syph N Y* 28 53?
Bland, P B , Rakoff, A E and Pincus I J (1937) *Ibid*, 36 760
Cron R S , Shutter H W and Lahmann, A H (1940) *Amer J Obstet Gynec* 40, 88
Ebbs, J H (1938) *Arch Dis Childh* 13, 211
Epstein B (1924) *Jb Kinderheill* 104 129
Haler, D H (1932) *Brit med J* 1 1052
Haussmann, D (1875) Parasites des organes sexuels femelles de l homme et de quelques animaux Paris
Hesseltine, H C Borts I C and Plass, E D (1934) *Amer J Obstet Gynec* 27 112
Jones, C P and Martin D S (1938) *Ibid* 35 98
Liston, W C and Cruickshank, L G (1940) *Edinb med J* 47, 369
Martin, D S , Jones, C P , Yao, K F and Lee L E (1937) *J Bact* 34 99
McNeil, C (1940) *Lancet* i, 819
Stovall, W D and Bubolz, A A (1932) *J infect Dis* 50, 73
Thomson J (1941) in the press
Todd, R L (1937) *Amer J Hyg* 25, 212
Witkowski R (1935) *Zbl Bakt* 133 334
Woodruff P W and Hesseltine, H C (1938) *Amer J Obstet Gyne* 36, 467

in the glomeruli—including focal necrosis of the tuft, proliferative glomerulitis, capsular adhesions and hæmorrhagic infarction—and round-cell infiltration in the interstitial tissue, changes which in the human kidney had long been regarded as evidence of "nephritis." This experiment seems to demonstrate convincingly that certain histological lesions of the kidney formerly accepted as characteristic of nephritis can result from vascular lesions due to high blood-pressure—a conception already reached on purely clinical grounds.

These results were obtained in experiments of relatively short duration, most of the animals being killed within a few weeks of the onset of hypertension. Wilson and Byrom (1941) have also studied the results of long-standing hypertension in the rat. For this investigation 49 rats were killed after hypertension had persisted for periods of eight to forty-six weeks. Microscopically, obvious lesions were found in the unclamped kidney in most of the rats in the series; these differed from the acute necrotic lesions of the earlier experiments in being more chronic. Interstitial fibrosis and tubular atrophy and dilatation were more pronounced and the changes in arterioles and glomeruli suggested organisation and healing of the acute necrotic changes (fig 3). Not uncommonly acute and chronic lesions were seen in the same kidney—evidence of the progressive character of the process. The lesions were essentially focal and vascular in distribution, occurring in wedge-shaped areas related to the artery of supply, the structures in the intervening areas between the wedge-shaped areas of atrophy being relatively well preserved. In severe cases, however, the changes were so extensive that the greater part of the kidney was involved.

Wilson and Byrom have described in detail the changes found in these rats. From their description and photomicrographs it will be seen that the kidneys closely resemble those seen in certain forms of chronic hypertensive Bright's disease. The earlier observations of Wilson and Byrom established that the acute vascular and renal lesions seen in malignant hypertension in man could result in the rat from hypertension alone; these findings in rats with long-standing hypertension show that, in the rat, hypertension can also lead to chronic renal and vascular lesions which reproduce almost perfectly those found in certain forms of chronic Bright's disease in man (figs 3–6).

There is a further inference to be drawn from these observations: the possibility of a vicious circle in which hypertension leads to occlusive renal vascular lesions with resulting renal ischæmia, this in turn giving rise to further hypertension. That such a vicious circle does exist in the experimental animal is substantiated by their further experiments which have shown (1) that hypertension persists in the rat after removal of the clamped kidney; (2) that this persistent hypertension is related to the severity of the damage in the unclamped kidney; and (3) that further acute vascular lesions arise after the clamped kidney has been removed.

In the rat, then, the experimental production of ischæmia in one kidney leads to hypertension which in turn leads to destructive vascular lesions in the other kidney. If the clamped kidney is now removed, hypertension persists owing to the ischæmia produced by these hypertensive lesions in the remaining unclamped kidney. Moreover the condition is progressive, further vascular lesions giving rise to increasing ischæmia of the kidney which in turn augments the hypertension—a true vicious circle.

Clinical Implications

The demonstration by Goldblatt that renal ischæmia can lead to hypertension has persuaded some writers to return to the old idea that all hypertension is renal in origin. In discussing the ætiology of essential hypertension I showed that the evidence for this view was inconclusive and that there was a considerable body of evidence pointing in the opposite direction. I do not think that Goldblatt's work justifies the assumption that all hypertension is renal in origin. I suggest that the conception of a non-renal essential hypertension should be retained until further evidence of its mode of origin is forthcoming. The important advance which has followed from Goldblatt's work is, in my opinion, the demonstration by Wilson and Byrom that hypertension can produce in the kidney progressive histological changes formerly termed "chronic interstitial nephritis." The recognition of malignant hypertension had already demanded the acceptance of this concept, but the production by designed experiment of such renal lesions has, I think, definitely established their hypertensive origin; and this is crucial to an understanding of chronic Bright's disease.

A major difficulty in the understanding of chronic Bright's disease is that different forms of renal disorder may, in their late stages, show a very similar clinical picture consisting of hypertension, renal failure and hypertensive retinitis with papillœdema. Histologically the same difficulty occurs, the kidneys showing a similarity of histological change which has made their differentiation difficult. This is the syndrome formerly called chronic interstitial nephritis and still so described in most textbooks. For many years close observers of Bright's disease have suggested that chronic interstitial nephritis was not an entity, since the natural history of such cases was so varied. This view is now gaining general acceptance. The recognition of malignant hypertension and its differentiation from chronic type 1 nephritis was an important step in this direction. More recently, appreciation that chronic pyelonephritis could have a similar end-result, and that it accounted for a considerable group of patients dying with contracted kidneys has marked a further advance. We are all familiar with other renal disorders which may have a similar termination—for example, the late stage of a toxæmia of pregnancy which has not cleared up, or the chronic interstitial nephritis seen sometimes in workers in lead. Indeed even the amyloid kidney may terminate with the clinical and histological picture of chronic interstitial nephritis superimposed on amyloid disease.

The animal experiments of Wilson and Byrom seem to offer an explanation of this similar termination to such different conditions. We have seen that renal ischæmia leads to hypertension and that hypertension can itself produce chronic renal lesions. Since almost any renal disorder may lead, in its later stages, to renal ischæmia, it is not surprising that hypertension is a late manifestation in so many forms of renal disease; nor is it surprising that in these different disorders renal lesions of similar type due to this hypertension are also found. I suggest that chronic interstitial nephritis, as we have known it in the past, is merely the result of hypertension; and that the term should now be dropped, leaving us free to turn to a closer study of the various underlying disorders in relation to their attendant hypertension.

TYPE 1 NEPHRITIS

I have already pointed out (in my first lecture[1]) that in addition to death or recovery type 1 nephritis could terminate in two ways: by a rapidly progressive course, with death in a matter of weeks or months (the subacute nephritis of Volhard), or by a very chronic course persisting over years or decades (the "chronische Nephritis mit sehr langsamer Verlaufsart" or the "Vaskular typus" of Volhard). The first of these conditions is obviously a progressive glomerulonephritis. Clinically there is a steadily progressive picture and histologically the glomeruli show what is obviously a progressive stage of the acute lesion. There is no evidence that hypertension plays a material part in the progress of the disease in these patients. Terminally, however hypertension seems sometimes to play a part, for not infrequently there is a "malignant termination" with well-marked hypertension and papillœdema. In such cases hypertensive vascular and glomerular lesions will be found on histological examination.

The second course of chronic type 1 nephritis is very different. Here we see recovery from the acute attack except for a persistent symptomless albuminuria followed by a gradually developing hypertension and ending in uræmia years or decades later with severe hypertension, hypertensive retinitis and papillœdema. Histologically the kidneys of such patients show no obvious trace of the original condition, the histological picture being similar to that seen in long-standing hypertension in rats. We agree with Volhard in considering this course of nephritis to be a vascular process. This view is supported by the focal distribution of the lesions, which consist of wedge-shaped areas of atrophy and fibrosis

---

[1] *Lancet* Jan 3 1942, p 1

Contracture of the superficial tissues was remedied by excision of the scar followed by grafting Full thickness dissection grafts from either the abdominal wall or the anteromedial aspect of the thigh were used and stitched in position Since amnioplastin formed an avascular bed these grafts were not altogether successful and became partially fibrosed In a later case I have attempted to surmount this difficulty by covering the amnioplastin with a flap of skin from the side of the wound An incision was made parallel to the length of the wound edge and curving away from it proximally The intervening flap of skin was undercut, mobilising it in the centre but leaving it attached at the proximal and distal ends, and it was used to cover the amnioplastin The donor raw area was in turn covered with a full thickness graft from the abdomen

Periarticular adhesions proved a serious handicap in two of the cases (3 and 4) The adhesions were firm and gentle manipulation produced little improvement in the range of movement At operation a record of the absolute range of passive movement should be made, for this sets the limit to the amount of movement one can finally expect

Peritendinous adhesions were present in all cases but varied in amount and distribution In case 1, there were slight anterior and posterior adhesions In cases 2 and 3 dense scarring of the anterior sheath wall bound down the tendons but there were no gross posterior adhesions In case 4, the remains of the flexor pollicis longus were firmly scarred anteriorly and posteriorly To form a new sheath and prevent the tendon from becoming adherent again, the exposed areas of tendon were covered by a layer of amnioplastin Where posterior adhesions had been removed, one layer of amnioplastin was placed deep to the tendon and another layer laid on its anterior aspect The tendon was completely covered by the amnioplastin, which adheres lightly without any suturing

There was no gross inflammatory reaction in any of the cases In case 1, the original infection had been slight and operation was carried out two weeks after injury Postoperative sepsis was limited to slight reddening of the skin edges for a few days In case 2, five months elapsed between the original wound, which was lightly infected, and the first plastic operation, while a further two months separated the two plastic operations Postoperative sepsis was again slight, even though healing was complicated by the presence of a full thickness graft with insufficient blood-supply Case 3 had gross sepsis originally and was operated on two months after the original drainage wounds had healed The slight postoperative sepsis which occurred was limited to the area of the skin graft There was no postoperative sepsis in case 4, where operation was carried out three months after the original infected wounds had healed Sulphanilamide, as powder insufflated into the wound and as tablets by mouth, was exhibited in cases 2, 3 and 4, but no conclusions could be drawn as to its value

In all cases the superficial tissues have remained freely movable over the tendon for three months after operation Case 2 provided a valuable opportunity to examine the amnioplastin in situ two months after insertion It was found as a thin transparent gelatinous membrane, from which the overlying fibrosed tissues were easily separated, and beneath which the tendons could be seen to move freely Moreover, there were signs of it being vascularised from the edges

The results so far have been gratifying In case 1, scar contracture and periarticular adhesions were absent In spite of the profundus and half the sublimis being lost good power and a fair range of movement (m p joint full, proximal i p joint 180°–150°) were obtained In case 2, scarring and contracture of the superficial tissues and anterior wall of sheath were causing a crippling deformity The patient now has full movement of m p and proximal i p joints and good power Scarring, peritendinous and periarticular adhesions combined to produce an awkward stiff finger in case 3 Nevertheless she now has a finger with moderate power and a useful range of movement In this case the profundus tendon continues to move through the sublimis to produce flexion at the terminal i p joint Case 4 showed that even when most of the tendon has sloughed the remainder can supply moderate power and mobility providing the joints are free The lumbricals (cases 1, 2 and 3) and the small thenar muscles (case 4) greatly assisted the salvaged tendons in the production of power and flexion at the m p joints

Since tendons which have been fixed by suppurative tenosynovitis can be mobilised and prevented from re-adhering by wrapping amnioplastin round them, it seems advantageous to use amnioplastin in the same way when suturing cut flexor tendons on the fingers and in tendon transplantation or reconstruction operation. The material is easy to obtain in any hospital where there is an obstetric department, and was kindly prepared for me by the pathological laboratory staff All the cases were treated as outpatients only Postoperative pain was slight, never lasted more than twenty-four hours, and was easily controlled by aspirin (gr 10 six-hourly)

SUMMARY

Stiff fingers due to suppurative tenosynovitis may be partially mobilised and further adhesions prevented by using amnioplastin

In 4 cases results have been satisfactory up to three months after operation

The use of amnioplastin is suggested in suturing cut flexor tendons and in plastic operations on these tendons

I wish to thank the medical superintendent of the hospital for permission to publish these cases

REFERENCES

Chao, Y C, Humphreys, S and Penfield, W (1940) *Brit med J* i, 517
Kohnstam, P (1941) *Ibid*, i, 493
Law, B B and Philip J F (1941) *Ibid*, i, 514
Penfield, W (1940) *Ibid*, ii, 668
Rogers, L (1941) *Ibid*, i, 587

NATURAL HISTORY OF BRIGHT'S DISEASE*

CLINICAL, HISTOLOGICAL AND EXPERIMENTAL OBSERVATIONS

ARTHUR ELLIS, O B E, M D TORONTO, F R C P,
DIRECTOR OF THE MEDICAL UNIT AT THE LONDON HOSPITAL,
PROFESSOR OF MEDICINE IN THE UNIVERSITY OF LONDON

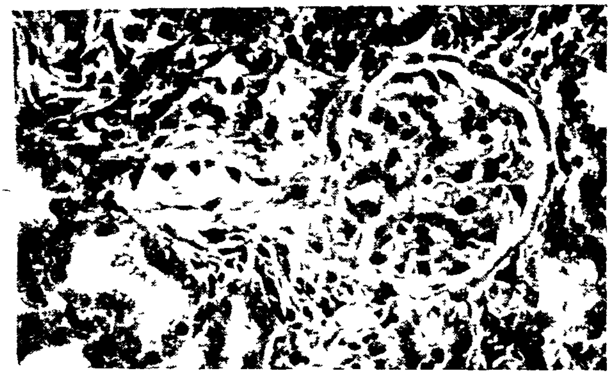
III —THE VICIOUS CIRCLE IN CHRONIC BRIGHT'S DISEASE

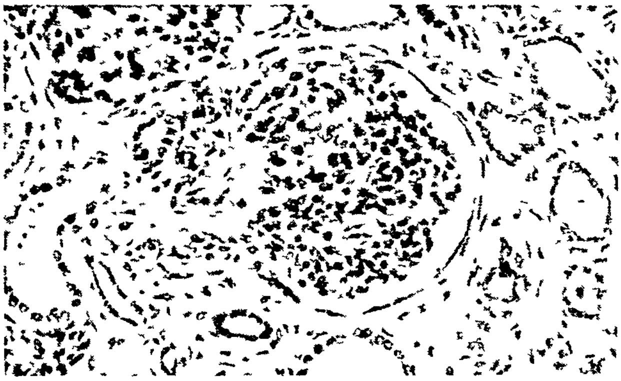
THE experimental production of hypertension in animals has been attempted for many years The results of these manifold efforts suggested that any measure which led to diminished blood-flow through the kidney might lead to hypertension It was the realisation of this generalisation which led to the successful experiments of Goldblatt and his colleagues (1934), who devised a screw-clip which, when applied to the renal artery, enabled them to diminish in varying degrees the blood-supply to the kidney Goldblatt found that if such a clip was applied to one renal artery of a dog, hypertension resulted Owing to the development of a collateral circulation this hypertension was, however, temporary, and to make the hypertension permanent clips had to be applied to both renal arteries Some of these dogs with permanent experimental hypertension died with renal failure and showed in organs other than the kidney acute arteriolar lesions exactly similar to those seen in malignant hypertension in man (Goldblatt 1938) These acute vascular lesions were not present in the kidneys, presumably because, owing to the clips, the hypertension was not present in these organs This observation was made independently by Wilson and Pickering (1938) who described widespread acute arteriolar lesions in rabbits similar to those seen in malignant hypertension in man

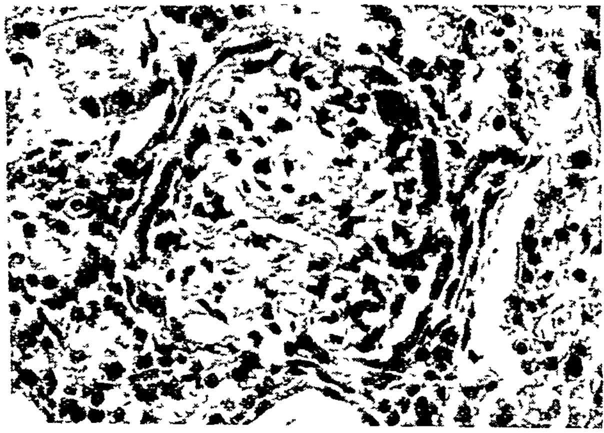
More important than this, Wilson and Byrom (1939) produced permanent hypertension in rats in which one renal artery only was clamped Glomerular and arteriolar lesions identical with those seen in malignant hypertension occurred in the unclamped kidney and were absent in the clamped kidney These lesions included acute fibrinoid necrosis of the arterioles (figs 1 and 2), endarteritis of the medium-sized arteries, acute changes

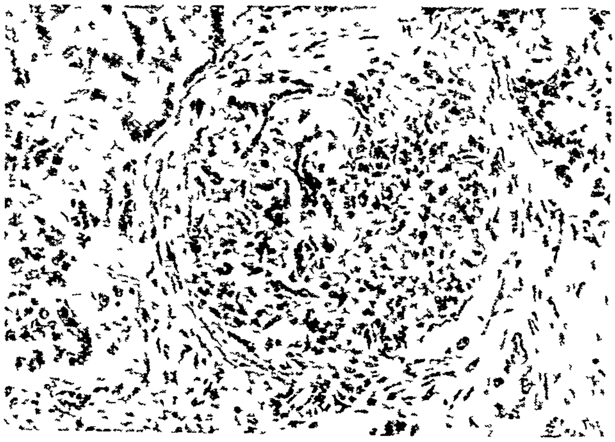
---

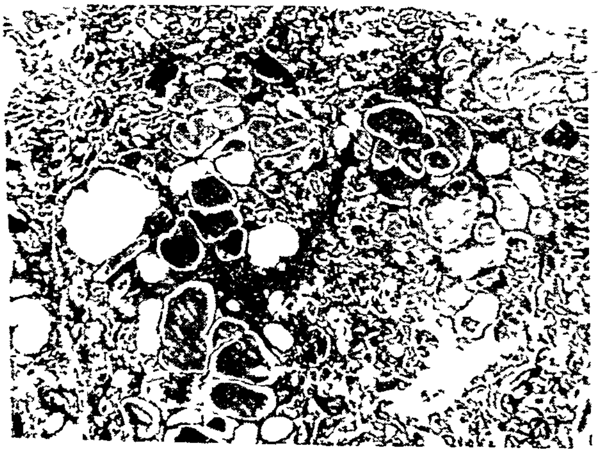
* The third and concluding Croonian lecture for 1941 not delivered owing to the war

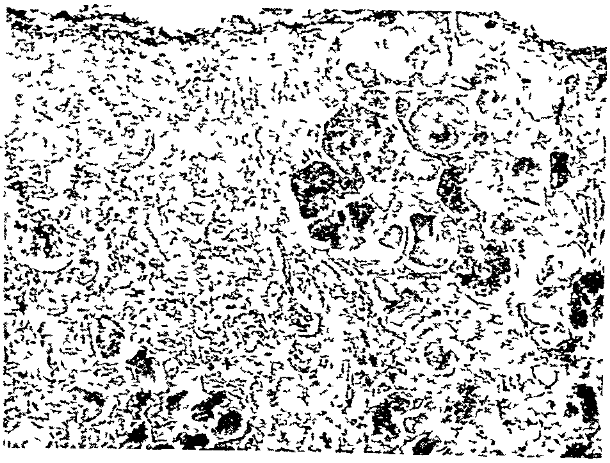
1


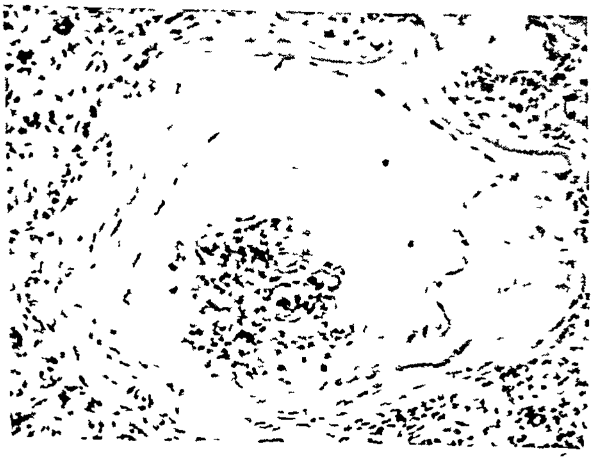
2


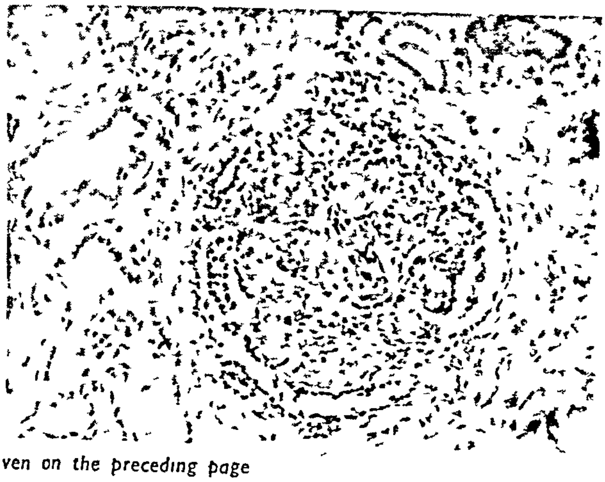
3


4


5


6


7


8


Legends to the illustrations are given on the preceding page separated by areas of relatively well-preserved tissue in which the remaining tubules are dilated This distribution is also present in rats with long-standing hypertension, and the glomerular and vascular lesions are also very similar We interpret the march of events in these patients as follows the acute nephritis subsides but some damage remains as evidenced by persistent albuminuria, whence we presume there is also some permanent vascular damage which leads to renal ischæmia , this renal ischæmia eventually leads to renal hypertension, and so a vicious circle is introduced, hypertension causing vascular damage leading to further ischæmia and augmented hypertension

TYPE 2 NEPHRITIS

This is a progressive disorder, as is made evident by its steadily downhill clinical course and the histological picture of a diffuse glomerulonephritis involving more or less equally all glomeruli, which show increasing structural disorganisation as the disease progresses Until the late stages hypertension is usually not a prominent feature, and histologically we see no evidence of hypertensive lesions in patients dying in the earlier stages Terminally there is often a considerable rise of blood-pressure, and when this occurs hypertensive retinitis (with papillœdema) and renal failure rapidly follow In such instances hypertensive renal and vascular lesions may be found, the vascular lesions being often of the acute necrotic type seen in malignant hypertension

MALIGNANT HYPERTENSION

This condition is the outstanding demonstration of so-called chronic interstitial nephritis caused by hypertension The conception of a vicious circle explains the rapidly progressive course of this disorder Further it removes the main obstacle to its recognition by the pathologist, for the occurrence of such a vicious circle as a terminal event in other forms of renal disease explains the presence in these conditions of the acute necrotic vascular lesions so constantly seen in malignant hypertension This conception also explains the occasional occurrence of a malignant termination in patients with benign hypertension

BENIGN HYPERTENSION

The vast majority, probably more than 90%, of all patients with hypertension belong in this benign group, in which with rare exceptions no renal damage is clinically demonstrable At death the kidneys show varying degrees of arteriosclerosis which we consider to be the result of the hypertension, not its cause We do not know why the vicious circle is so seldom seen in these patients Factors which may be concerned are the age of the patient, the rate at which the hypertension develops and its intensity in the early stages The mechanism of the vicious circle does occasionally come into action in benign hypertension, sometimes in the form of a malignant termination and sometimes in a more chronic form, as discussed in my last lecture

CHRONIC PYELONEPHRITIS

In recent years it has become increasingly realised that in certain cases chronic pyelonephritis can lead to death in uræmia This has been due chiefly to the work of Longcope (1933, 1937), whose observations have been confirmed by Weiss and Parker (1939) These observers believe that many cases formerly regarded as chronic glomerulonephritis are really examples of chronic pyelonephritis In such cases there is commonly gross renal contraction or well-marked inequality in size of the kidneys It is surprising that this degree of renal contraction and renal failure occurs in only a minority of cases of pyelonephritis and it may be that there is in this group some primary developmental abnormality, vascular or otherwise, which leads to imperfect drainage of the kidney and hence predisposes to infection The series of cases of renal dwarfism with an associated dilatation of the urinary tract which Evans and I reported some years ago are presumably of this type Whether this is so or not, chronic pyelonephritis is difficult to recognise clinically, for only rarely is there a history of symptoms suggesting pyelitis, and in the late stage, when these patients usually first come under observation, pus is often absent from the urine , bacteria, of which *Bacillus coli* is the most common, may or may not be present Longcope has called attention to the very slow rate of progress in this condition and we have repeatedly confirmed this observation These patients may have advanced renal failure (even a blood-urea over 100 mg per 100 c cm) for several years and yet remain in moderately good health and capable of work In our opinion this is seen, however only in the absence of any considerable hypertension In those patients who develop hypertension the blood pressure may reach high levels, downward progress is then rapid, hypertensive retinitis with papillœdema appears and death occurs in uræmia.

The histological picture in chronic pyelonephritis is characteristic, and once appreciated can be recognised and separated from other forms of so-called chronic interstitial nephritis The form with which it is most often confused is chronic type 1 nephritis The main histological features of chronic pyelonephritis are extensive atrophy and fibrosis involving medulla as well as cortex, the latter containing areas of dilated tubules full of hyaline casts resembling the histological appearance of thyroid tissue , beneath the capsule large collections of closely set, completely hyalinised glomeruli may be seen A very characteristic glomerular lesion is dilatation of the capsular space, with pericapsular fibrosis, and thickening of Bowman's capsule which may assume a curious wavy appearance (fig 7) Polymorphonuclear leucocytes may be present in some tubules and there may be thickening of the peripelvic tissues with evidence of chronic inflammation If hypertension has been present, hypertensive lesions may also be seen (fig 8) Excluding cases of malignant hypertension, out of 45 contracted kidneys in our series studied histologically, 13 were examples of chronic pyelonephritis

A further observation on chronic pyelonephritis confirms the experimental findings of Wilson and Byrom and demonstrates that the results they obtained in rats are directly applicable to man I refer to the examples of unilateral renal disease, often a pyelonephritis, associated with hypertension Cases were first described by Butler (1937) and Leadbetter and Burkland (1938), in which removal of a diseased kidney led to the disappearance of a previous hypertension A number of further cases have since been reported Weiss and Parker (1939) have called attention to the finding at autopsy of a small atrophic kidney on one side and a normal or enlarged kidney on the other, the latter showing histologically the picture of malignant hypertension We have seen this association several times, and in view of the experiments in rats it is what we should expect, ischæmia in the atrophic kidney leading to hypertension which in turn leads to hypertensive lesions in the healthy kidney From the animal experiments it appears that hypertension might persist after, or be aggravated by, removal of the diseased kidney if lesions of sufficient extent have developed in the other kidney This probably explains the persistence of the

---

LEGENDS TO ILLUSTRATIONS

FIG 1—Rat kidney Acute fibrinoid necrosis of afferent arteriole to glomerulus in unclamped kidney of hypertensive rat (× 260)

FIG 2—Human kidney Malignant hypertension acute fibrinoid necrosis of afferent arteriole to glomerulus (× 165)

FIG 3—Rat kidney Chronic hypertensive lesion of glomerulus showing organising necrosis with loss of lobulation of tuft, cellular proliferation, heightening of capsular epithelium and extensive capsular adhesions (× 320)

FIG 4—Human kidney Chronic type 1 nephritis Similar picture with organised lesion of afferent arteriole (× 170)

FIG 5—Rat kidney Focal areas of tubular atrophy and dilatation in unclamped kidney of hypertensive rat (× 30)

FIG 6—Human kidney Malignant hypertension, showing similar picture (× 44)

FIG 7—Human kidney Chronic pyelonephritis Dilatation and distortion of Bowman s capsule with capsular fibrosis (× 170)

FIG 8—Human kidney chronic pyelonephritis "Hypertensive" glomerulus showing necrosis of capillary loops increased cellularity of tuft, extensive capsular adhesions and heightening of parietal and visceral epithelium (× 170)

Medical Societies

ROYAL SOCIETY OF MEDICINE

At a meeting of the Section of Surgery on Jan 7, with Mr E **Rock Carling**, the president in the chair, five short communications were made.

REGIONAL ANÆSTHESIA

Mr H. W **Burge**, on behalf of himself and Dr N R **James**, described an improved method of regional anæsthesia in acute abdominal surgery. This consisted of adequate pre-operative sedation with 'Omnopon' (Roche), the preliminary use of a short-action barbiturate, in their cases hexobarbitone, posterior bilateral nerve block of the lower 7 dorsal nerves, bilateral splanchnic block, oxygen therapy, and gentle technique. Their paper has already been published elsewhere.[1] Commenting on it, Mr **Rock Carling** said that the Russians, using local anæsthesia for war wounds, had found that the operation turnover was maintained and that patients could be evacuated more rapidly and safely.

ENDOTHORACIC SYMPATHECTOMY

Squadron-Leader J **Hughes** described a technique for endothoracic sympathectomy. Viewed through the thoracoscope the thoracic sympathetic nervous chain could be seen gleaming through the single layer of pleura which covered it. He performed division of the splanchnics and removal of the stellate ganglion by means of a specially designed scissors and forceps which can be introduced together through a single cannula, the same size as the cannula used for thoracoscopy. Pneumothorax was induced in the patient over a week, and checked by radiography. For section of the splanchnic the patient lay face downwards and one cannula was introduced between the 7th and 8th ribs, the other between the 8th and 9th ribs. The upper cannula was used for thoracoscopy, the lower for instruments. The pleura at the level of the great splanchnic nerve was incised over the body of the vertebra, where it was relatively insensitive, the forceps were then withdrawn from the cannula and a blunt hook inserted by means of which the splanchnic was drawn through the pleural incision. A piece of the nerve was excised with the scissors, and if swabbing was needed the hook was removed and a piece of gauze introduced by the forceps. Removal of the stellate ganglion was carried out from the front with the patient lying on his back. The neck of the 2nd rib was identified and the pleura was infiltrated over the necks of the 1st and 2nd and almost down to the 3rd vertebra. A vertical incision was then made in it with the scissors, and if the stellate ganglion could be seen it was picked up and the rami divided above and below. If it could not be identified it was necessary to clean away all tissue down to the neck of the 2nd rib in order to ensure its destruction. Squadron Leader Hughes reported 4 cases treated in this way, 2 for hypertension, 1 for Raynaud's disease, and one for pain in an amputation stump. In the first patient bilateral splanchnic resection was carried out successfully in two operations. The initial blood-pressure was 238/140 mm Hg, but on discharge it had only fallen to 216/136. The second case had coronary insufficiency as well as hypertension, and died of coronary occlusion four days after the first operation, for right splanchnic resection. In third patient resection of the right stellate ganglion was done, after which the Raynaud's disease, which had affected both her hands, was much improved in the right. In the fourth patient resection of the right stellate ganglion relieved all pain in the stump of his amputated right arm.

URINARY DIASTASE IN THE ACUTE ABDOMEN

Mr E B **Hughes** said that in America deviations from the normal value of the diastase, or amylase, of the urine in acute abdominal conditions were regarded as rare except in acute pancreatitis. Normally the diastase content of the urine fluctuated, depending on the concentration of the urine. He had investigated the level in all the acute abdominal cases admitted to an outlying hospital, using single specimens taken before operation. In one case diagnosed as perforated peptic ulcer the urinary diastase had been over 300 units, and he had hurried to the theatre where the operation was in progress, expecting to see an acute pancreatitis. Actually the case proved to be a perforated peptic ulcer, as diagnosed and the pancreas was perfectly healthy; there were, however, patches of fatty necrosis in the omentum. The same thing happened in a second case: there was a high urinary diastase, a perforated ulcer, and some patches of fatty necrosis. In both these cases the urinary diastase fell to normal soon after the operation. Later he saw two other cases of the same kind, though in the second of these the urinary diastase did not reach a level as high as that in the other three. He therefore concluded that levels of urinary diastase up to 400 units in acute abdominal cases did not seem to be diagnostic between acute pancreatitis and perforated peptic ulcer. The fatty necrosis seen in these cases might be explained in one of three ways: there might be an area of acute pancreatitis existing independently of the perforating ulcer, but this seemed unlikely; or ulcers might be present which had penetrated the pancreatic tissues, though there was nothing to suggest this in the case seen; or—most probably—the duodenum might have contained much pancreatic juice at the time of perforation and this, on escaping, might have caused the fatty necrosis.

TETANUS IN A LONDON SECTOR

Mr E J **Radley Smith** said that in Sector 9 tetanus had been made notifiable, and 7, possibly 8, cases had been reported in the first two years of war. All except one were in civilians who had not been immunised, and the only soldier affected had also escaped immunisation. He also failed to receive a prophylactic dose of antitetanic serum, when he returned wounded from Dunkirk, because his injury was slight, and the limited supply of serum then available was used for graver cases. He developed tetanus 7 days after being wounded and died in spite of large doses of serum given as soon as symptoms appeared. The remaining 6 certain cases of tetanus all received prophylactic doses of 2600–3000 units on the day of injury; only one of them died, a woman of 45 who had been pinned against a hot stove in a bombed house and suffered burns of the side and thigh. She developed symptoms on the 10th day and died on the 12th in spite of much serum. The one doubtful case was seen in a girl who had a penetrating wound of the brain, piercing the temporal muscle, and who afterwards developed a cerebral abscess. The spasm of the temporal muscle which developed might have been due to the injury. Only in 2 cases in the series were the injuries severe or deep, and both of these recovered. The official prophylactic dose had first been 2600 units, but lately it had been proposed that 3 doses of 3000 units should be the routine; unfortunately the first proposal still lingered in the minds of the profession, and moreover prophylactic serum was seldom given to patients with burns. Thus the optimum prophylactic dose was not likely to be extended to all casualties. The advantages of active immunisation, he thought, should be laid before the public.

Mr S M **Cohen** said that of 3 cases occurring at his hospital, one had been a case of burns. Tetanus bacilli were often present on the skin, and in cases of burns smears should be examined for these organisms, especially before enclosing a burned limb in a Bunyan-Stannard envelope. Mr **Rock Carling** remarked that the official prophylactic dose had been raised from 2600 to 3000 because of deterioration of the serum on keeping; probably a fresh issue should now be sent round the country.

REPLACEMENT OF AVULSED TISSUE

Mr P H **Jayes** described the case of a gipsy boy who was savaged by an unfamiliar horse, losing a piece of skin and subcutaneous tissue measuring 7 in by 3½ in from the front of his right thigh. His mother retrieved the missing piece, clapped it back and brought him to hospital. The boy was anæsthetised and the wound and the avulsed skin cleansed. The missing tissue had left the underlying muscles exposed but undamaged, and the upper part of the patella was visible at the lower end of the wound. The fat was dissected off the under surface of the skin, which was thus converted into a skin graft; it was stitched carefully into place with interrupted sutures, tiny slits were made in it, and it was dressed firmly with fine layers of wool soaked in paraffin, gauze, wool and a hypertension which is sometimes seen after removal of a kidney in what appeared to be unilateral renal disease

---

[1] *Brit med J* 1941, ii 906

TOXÆMIA OF PREGNANCY AND OTHER CAUSES OF CHRONIC HYPERTENSIVE BRIGHT'S DISEASE

Most patients with toxæmia of pregnancy recover completely after delivery, but in some hypertension persists and may ultimately reach high levels The amount of albumin in the urine of such patients is variable , it may be slight or even absent or it may be considerable This state of affairs may persist for years without much evidence of ill health and the patient may pass successfully through further pregnancies Eventually renal function begins to fail and the patient dies, usually with mixed cardiac and renal failure Hypertensive retinitis with papillœdema may or may not be present Little is known of the cause of toxæmia of pregnancy or of the mechanism of the hypertension which occurs in it Fishberg (1939) regards the hypertension as a form of essential hypertension In our experience the course differs from that usually seen in benign hypertension, the amount of renal involvement being greater ; thus albuminuria is more frequent and more marked, and renal failure common The course, however, is a slow one and only after many years—ten to fifteen, for example—leads to death in uræmia with or without a malignant termination I visualise the process as one of slowly progressive renal ischæmia analogous to that occurring in chronic type 1 nephritis but originating from a different cause

We have seen that any condition leading to ischæmia of the kidney may give rise to hypertension, and, by the establishment of a vicious circle, to "chronic interstitial nephritis" This seems to be the explanation of the occurrence of the latter in the chronic hypertensive disease of lead workers and occasionally in various other conditions such as amyloid disease, congenital cystic kidneys, and oddities such as atheroma or congenital hypoplasia of a main renal artery

* * *

I have considered the course of various forms of chronic hypertensive Bright's disease and have shown that what is called chronic interstitial nephritis is not an entity but the manifestation of a process which may occur in any form of renal disease with hypertension This process consists in the establishment of a vicious circle dependent on renal ischæmia Chronic interstitial nephritis is merely the end stage of various forms of renal disorder, and for a proper understanding of Bright's disease this term should be discarded Chronic hypertensive Bright's disease is composed of a number of entities, including chronic type 1 nephritis, chronic type 2 nephritis, benign and malignant hypertension, chronic pyelonephritis, the hypertension following toxæmia of pregnancy, and various other odd conditions The separation of these various entities is most easily achieved by careful observation of the natural history of their development Since hypertension is common to them all it is not surprising that the morbid anatomist viewing the end state has found difficulties of interpretation, or that the pathological classification of Bright's disease has been traditionally confused

On the basis of the clinical, histological and experimental observations reported in these lectures I would propose the following classification of Bright's disease —

Nephritis	Type 1 nephritis Type 2 nephritis
Essential hypertension	Benign hypertension Malignant hypertension
Miscellaneous conditions	Acute focal nephritis Acute interstitial nephritis Toxæmia of pregnancy Mercurial nephrosis Amyloid nephrosis Chronic pyelonephritis "Chronic nephritis" of lead workers

In the miscellaneous group the renal disorder is incidental to some other disease The conditions in this group are best considered in relation to their primary cause and separated from the two main groups of Bright's disease—nephritis and essential hypertension

Summary

There are two varieties of nephritis, differing in their ætiology, mode of onset and course Recovery is the rule in one and the exception in the other We have designated these two types of nephritis type 1 and type 2 Type 1 nephritis commonly has a history of preceding infection (84%) Its onset is abrupt, blood is usually present in the urine, complete recovery normally occurs (82%) Type 2 nephritis has a history of preceding infection in less than 5% and even in these it is often indefinite Its onset is insidious, blood is rarely present in the urine, the disease is progressive and recovery is rare We include nephrosis in type 2 nephritis. The course of the two types of nephritis is different Type 1 nephritis may run a rapid or a very chronic course, type 2 nephritis runs a continuously progressive course The histological picture in the two types of nephritis is different, especially in the late stages

Until further evidence is available it is best to regard essential hypertension as non-renal in origin It is seen in two forms—benign hypertension, which comprises more than 90% of all patients with hypertension, and malignant hypertension In benign hypertension there is usually no evidence of renal impairment, and renal failure only very rarely occurs , the condition may persist for decades In malignant hypertension renal involvement is always present in the late stages and death in renal failure is common The condition is rapidly progressive, the patient usually dying within a year of the first symptom The pathognomonic sign of malignant hypertension is papillœdema

Experiments in animals have shown that renal ischæmia leads to hypertension and that this hypertension can produce in the kidney lesions formerly regarded as "nephritis" Moreover this process is progressive, a vicious circle being established in which renal ischæmia leads to hypertension and this in turn leads to obliterative vascular lesions causing further renal ischæmia and augmented hypertension

So-called chronic interstitial nephritis is a hotchpotch of various renal disorders on which this vicious circle has been superimposed The expression should therefore be discarded, and if a generic term is required should be replaced by "chronic hypertensive Bright's disease" This consists of a number of entities with different natural history and different histological picture chronic type 1 nephritis, chronic type 2 nephritis, benign and malignant hypertension, chronic pyelonephritis, the hypertension following toxæmia of pregnancy, and the hypertension of lead workers They are best separated by a study of their natural history, but if first seen in the late stage this may be difficult or impossible

I should like to acknowledge my obligation to Prof Hubert Turnbull, F R S , who placed at my disposal the histological preparations of his department, and to my collaborators Dr Horace Evans and Dr Clifford Wilson, with whom it is hoped to publish in the near future details of the clinical material on which these lectures are based

REFERENCES

Allbutt, C (1895–96) *Trans Hunter Soc* p 38
Butler, A M (1937) *J clin Invest* 16, 889
Ellis, A (1938) *Lancet*, i, 977
Fahr T (1919) *Virchows Arch* 226, 119 , (1925) in Henke and Lubarsch s Handbuch der speziellen pathologischen Anatomie und Histologie Berlin
Fishberg, A M (1939) Hypertension and Nephritis, Philadelphia
Goldblatt, H (1938) *J exp Med* 67, 809
— Lynch, J Hanzal, R F and Summerville, W W (1931) *Ibid* 59, 344
Goodhart, J F (1879) *Guy's Hosp Rep* 24 1_3
Huchard H (1899) Traité clinique des maladies du cœur Paris
Kimmelstiel P and Wilson, C (1936) *Amer J Path* 12 45
Leadbetter W F and Burkland, C E (1938) *J Urol* 39, 611
Longcope W T (1937) *Ann intern Med* 11 149
— Winkenwerder W L (1933) *Bull Johns Hopk Hosp* 53, 2_5
Mahomed F A (1874) *Brit med J* i 585
Russell D S (1929) Spec Rep Ser *Med Res Coun Lond* No 142
Turnbull, H M (1915) *Quart J Med* 8, 201
Volhard F (1931) Bergmann and Staehelin s Handbuch der inneren Medizin Berlin
— and Fahr (1914) Die Brightsche Nierenkrankheit Berlin
Weiss, S and Parker F (1939) *Medicine* 18 221
Wilson and Byrom, F B (1939) *Lancet*, i, 136, (1941) *Quart J Med* 10, 65
— and Pickering, G W (1938) *Clin Sci* 3 313

THE LANCET

LONDON SATURDAY, JANUARY 17, 1942

CASTS AND ANURIA

In most cases of nephritis renal tube casts acquire significance from their appearance during life in the urine rather than from their discovery by the histologist in the kidneys post mortem They are often expelled in enormous numbers daily for long periods, so there is ordinarily little reason to believe that they have played any part in promoting renal insufficiency by blocking the tubules in which they have formed Tubular obstruction by casts as a main factor has, however, been put forward with a considerable appearance of justification to explain the renal sequelæ of mismatched blood-transfusion[1] and compression injuries of the limbs[2] In these conditions extreme oliguria or anuria may set in early and persist until death, when the discovery of large numbers of casts in renal tubules seems to provide an adequate explanation by mechanical obstruction alone **Morison**[3] has supported this view by comparing his findings in three cases of crush anuria with the renal changes in four cases of myelomatosis with Bence-Jones proteosuria In myelomatosis, as **Bell**[4] pointed out, the permanent lodgment of very large casts in renal tubules comes to be associated with atrophy of renal parenchyma and fibrosis, and this may be looked upon as an effect of chronic obstruction

Histological appearances no doubt support the view that blockage of tubules by casts can diminish urinary output, but some observers are not satisfied that mechanical obstruction is the sole, or even the main, cause of anuria after crush injuries and mismatched transfusions It is not clear why the largest and most prominent casts should become impacted in collecting tubules, which are ever widening as they join up to form the larger ducts , it may be suggested that though their constituents are a primary abnormality they would not have accumulated if there had not been a deficiency in the stream of urine from some other cause The phenomena of recovery in some cases with copious diuresis and discharge of casts could as readily be attributed to improvement of tubular functions above, with increase of filtrate, as to sudden loosening of all the impacted casts in the lower segments **Bywaters** and **Beall**[5] have remarked on the extremely low concentration of any urine that may be voided in cases of crush syndrome, a fundamental defect which is not clearly accounted for by obstruction of some tubules Some observers[6] also consider that the amount of tubular blockage in post-transfusion cases is inadequate to account for renal failure The experimental evidence is far from decisive **Baker** and **Dodds** showed that intravenous injection of hæmoglobin gave rise to renal insufficiency and even suppression, but only if the urine had previously been rendered acid so that precipitation occurred in the renal tubules This has been confirmed by **Goldring** and **Graeff**[8] and by **De Gowin** and others[9] It is noteworthy, however, that in **De Gowin** s experiment of seven animals which died of renal insufficiency only two had suppression , in the other five the urinary output remained fairly high until death, a fact which does not tally with mechanical obstruction as the main physiological defect

There is an alternative explanation for the anuria of these acute conditions As a rule the glomeruli are normal and alterations in the tubules often seem slight or attributable to the presence of the casts Definite epithelial changes have, however, been described—cellular necrosis[6] and regeneration with mitoses[10] in post-transfusion cases , extensive regenerative changes in the lower secretory segments of the nephrons in crush syndrome[11] In view of the importance of intact tubular linings for the transmission of concentrated urine, it may be that these manifestations, which are at times inconspicuous and are identifiable only in well-preserved tissues, are more common and more significant for impairment of function than has been realised At any rate it seems that something more than mechanical blockage of tubules must be adduced to account for the acute renal failure of crush syndrome and mismatched transfusion

REALISM IN FIRST-AID

Care of casualties is an expert business , but skilled surgeons are few, and in war-time injured folk are many The man who, as the last brick is removed from his chest and the rescue squad stands back, has the luck to catch the eye of a senior orthopædist may live to boast of a unique experience in perfect first-aid The rest of us will have to make do with the man in the street It may never be possible to teach this well-meaning chap exactly what to do, or more still what not to do, when he comes across an injured fellow creature There may always be disasters due to misplaced zeal, ill-digested information and bad teaching , but the better the teaching the better the aid, and the more numerous the competent first-aiders the better for us all Lecturing to candidates is often undertaken in a light or merely obliging spirit, but it carries a serious responsibility, as a peripatetic correspondent recognises (p 87) Only those who have lectured to different types of class realise how much depends on the actual technique of teaching, yet few of those doing this relatively thankless job have been taught to teach, and as **Potthof**[12] of Minneapolis insists, first-aid teaching is a specialised task requiring study and practice American first-aiders, it seems, commit the same errors as English ones They fail to examine patients carefully enough , they pay attention only to the worst injury , they use splints which are too short , and they incline firm bandage, the leg was placed on a plaster back splint The graft took except for a small area which had been bruised at the time of injury

---

[1] Baker S L and Dodds E C *Brit J exp Path* 1925, 6 247

[2] Longland C J and Murray, J *Lancet* 1941, ii 158

[3] Morison J E *J Path Bact* 1941 53 403

[4] Bell, E T *Amer J Path* 1933 9, 393

[5] Bywaters E G L and Beall D *Brit med J* 1941 i 427

[6] De Gowin F L Warner E D and Randall, W L *Arch intern Med* 1938 61 609

[7] de Navasquez S *J Path Bact* 1940, 51, 413

[8] Goldring N and Graeff I *Arch intern Med* 1933 58 825

[9] De Gowin E L , Osterhagen, H F and Andersch M *Ibid* 1937, 59 432

[10] Witts L J *Lancet*, 1929, i, 1927

[11] Dunn J S , Gillespie, M and Niven J S F *Ibid* 1941, ii, 549

[12] Potthof, C J *J Amer med Ass* 1941, 117, 1417

Mr R H O B ROBINSON said that in flaying wounds where the skin was rolled back like a stocking there was a great temptation to roll it straight up again and stitch it Removal of the subcutaneous fat was evidently important, and should be part of the technique Mr S M COHEN asked whether such a skin graft could have been put back over bare tendon or bone, or over lacerated muscle Was not a scarless bed needed? Mr JAYES replied that it was possible to place such a graft over tendon, or over bone provided the periosteum was intact Over a lacerated muscle it would not be satisfactory a smooth surface was needed

Reviews of Books

Principles and Practice of Ophthalmic Surgery

(2nd ed) EDMUND B SPAETH, M D London Henry Kimpton Pp 886 18s

THIS standard American textbook is a review of the world literature on the theory, principles and art of ophthalmic surgery Professor Spaeth in his second edition has included not only those surgical operations which he practises himself, but also those which he does not, quoting verbatim and at length from the writings of others For instance, in the radiotherapy section he quotes Stallard, and the section on corneal transplants is drawn completely from the writings of Ramon Castroviejo an acknowledged master of the subject The work is rather a reference book for the practising ophthalmic surgeon than a textbook for the student, who will find in it far more than he needs It is thus remarkable that in one or two places the information should be scanty, for example, the operative technique for the removal of a magnetic intra-ocular foreign body by the anterior route is dismissed in two paragraphs, and there is no mention of the giant magnet, without which many such foreign bodies would defy removal Professor Spaeth condemns the posterior route, except when its use is absolutely necessary—an opinion shared by most ophthalmic surgeons in this country

The Story of Clinical Pulmonary Tuberculosis

LAWRASON BROWN, M D, late director of Trudeau Sanatorium and lecturer in Trudeau School of Tuberculosis London Baillière, Tindall and Cox Pp 411 15s

THIS posthumous arrangement of lectures delivered by Lawrason Brown to Saranac students is supplemented with chapters on radiological diagnosis and thoracic surgery by two of his very distinguished friends The story details the slow and erratic growth and diffusion of tuberculosis lore throughout the ages and is divided into (*a*) the period of symptoms, extending from earliest times to Auenbrugger's development of percussion in the middle of the 18th century, (*b*) the period of physical signs, which includes the discoveries of Auenbrugger, Laennec and Koch, and culminated in the establishment of sanatoria, and (*c*) what might be termed the period of modern methods, from the middle of the nineteenth century to the present day, covering the development of sanatoria, radiology, and surgical treatment Interspersed in the narrative are portraits of "experts" paying professional visits (reconstructed from contemporary case-records) in the years 1700, 1800, and 1900, which present cross sections of the knowledge available at those epochs and the current conception (and misconceptions) concerning the nature of the disease The project of recording a tour with the visiting expert of 1930 was alas, never achieved These earlier chapters make first-class reading, they are witty, informative and abounding in imagination It comes as a shock to realise that Laennec, who devoted his life to developing and preaching *auscultation médiate* (i e stethoscopy), never seems to have doubted that all tuberculous patients were doomed, to learn that Forlanini hesitated ten years before inducing his first artificial pneumothorax, and to appreciate the tragic consequences of Brauer's first total thoracoplasty failing to be lethal

Pity the author did not live to complete and edit what might have been the greatest story in medicine A neutral observer would conclude that with the advent of X-ray diagnosis workers in pulmonary tuberculosis became exclusively cavity conscious, with cavity obliteration their only aim There is no mention of allergy and immunity, of the reactions of tissues and body-fluids of the interrelation of metabolism and infection, of the effects of rest and exercise, of the place of tuberculin and the noble metals in treatment, of the psychology of sanatoria and the psychogenesis of the disease These are notable omissions from a work sufficiently recondite to place on record the joyous news of a stethoscope invented by an Irish doctor in 1851 which required three hand to use it "and was, of course, impractical" Cavernous tubercle, it seems, is finding its way more and more into the surgeon's hands, and the "expert" of 1941, confronted with a patient's skiagram, announces how many ribs he proposes to remove From time to time a lone voice may be heard protesting, "Treat the patient and not the X ray" (E R Baldwin's is the first on record) much as a games-master yells, "Go for the man, not the ball" from the touchline—and with about as much effect But that is not the whole story It is not a fair presentation of the attitude towards pulmonary tuberculosis to-day Would Lawrason Brown have subscribed to it

Sternal Puncture

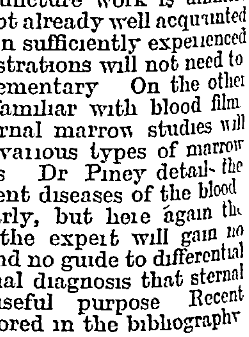
A PINEY, M D Birm, M R C P, physician to St Mary's Hospital for Women and Children, Plaistow London Wm Heinemann (Medical Books) Pp 77 12*s* 6*d*

Lord Horder in his foreword hopes this little book will be timely "because it summarises the position of the subject and acts as a manual for investigators whether *their approach is on the pathological or the clinical side* A book fulfilling this programme would certainly be useful, but this one does not go far towards completing it There is only one inadequate plate The author says this is because sternal puncture work is unlikely to be undertaken by anyone "not already well acquainted with hæmatology," but a person sufficiently experienced to be able to dispense with illustrations will not need to read the text—it is far too elementary On the other hand the worker reasonably familiar with blood film who wants to graduate to sternal marrow studies will find it hard to make out the various types of marrow cells from the text descriptions Dr Piney details the "myelograms" found in different diseases of the blood forming tissue reasonably clearly, but here again the lack of aim is troublesome the expert will gain no information, and the tyro will find no guide to differential diagnosis—yet it is in differential diagnosis that sternal puncture serves its most useful purpose Recent English writings are almost ignored in the bibliography

New Inventions

ILLUMINATED SIMS VAGINAL SPECULUM

PROBABLY the most generally useful and most widely used vaginal speculum is the Sims double duckbill The chief disadvantage of the standard pattern is that the instrument is not provided with a lighting attachment, and therefore one has either to wear a headlamp or to provide illumination from some other source, such as a handlamp By employing the concealed oblique lighting arrangement as used on the Naunton Morgan rectal speculum, this disadvantage is overcome As the lighting attachment is readily detachable the instrument is still easy to clean, and can of course be sterilised by boiling, a most desirable feature Also, since the lumen is not encroached on, there is no interference with vision or any necessary manipulations The lamp-holder will fit into either end, so that the two sizes which the Sims speculum provides are still instantly available The speculum was made for me by F Davidson & Co, now of 42, Langham Street, W 1



G A BAGOT WALTERS FRCSL

Annotations

TB ALMOST WHILE YOU WAIT

HITHERTO cultivation of tubercle bacilli has been too low a process to be of much use in diagnosis, but D M Pryce[1] has described a micro culture method which yields well-grown cultures within a week , Indeed, obvious signs of growth are visible with the $\frac{1}{12}$ in objective in 24 hours, colonies may be just perceptible with the $\frac{2}{3}$ in objective n 48 hours and in 3 days they are usually quite distinct The method consists in drying a film of sputum on a glass surface, treating with 15% sulphuric acid, washing with water and incubating with blood hæmolysed with distilled water or 1% saponin After 7 days' incubation the preparation is washed and stained with Ziehl-Neelsen and the colonies examined with the low power The most typical colonies are long and stringy, later becoming twisted and coiled, but compact and bushy forms occur Mycelial threads are found, and there is some suggestion that growth does not take place throughout the length of the thread but is restricted to certain points Two methods of applying this dried-film culture technique are described In one the sputum is spread on the floor of a petri dish In the other one or more circular patches of sputum are spread on a glass slide, dried, surrounded with a ring of bakelite, hard fibre or glass immersed in melted soft paraffin, and incubated in a moist chamber or with a coverslip to cover the ring The method was tried out on sputa from 48 cases from the male wards of Harefield Sanatorium In 28 growth was luxuriant and immediately obvious, and in 6 colonies grew which were sparsely distributed The remaining 14 yielded no growth The technique can also be applied to pus and caseous material

PLASMA IRON

ADVANCING biochemistry now allows the iron in blood plasma to be measured When every precaution against hæmolysis is taken there still remains a minute but fairly constant amount of iron measured in *microgrammes* per c cm Vahlquist[2] gives the normal limits as 80–190 µg per 100 c cm in men and 60–190 µg in women with average figures of 122 and 104 In disease these levels differ , but if we are to apply this newly acquired technique we must understand what has recently been learnt about the absorption and transport of iron Hahn, Whipple and their co-workers[3] used "marked" radio active iron to investigate this problem They found, as Widdowson and McCance[4] had done, that iron absorption is proportional to iron needs and that once it is absorbed there is little excretion of iron When iron salts are fed to dogs rendered anæmic by bleeding the radio-iron in the plasma rises rapidly, reaching a peak within 4–8 hours and then rapidly falling to resting level in 6–12 hours after feeding Radio-iron appears in red blood cells in traces as early as 4 hours after feeding and after 24 hours is present in considerable amounts Only about 10% of the absorbed iron can be accounted for as hæmoglobin iron, the rest presumably goes to iron stores The plasma iron thus represents iron passing between the alimentary tract, the red-cell forming tissues and the iron stores, and we might expect that the response to a test dose of iron would give some indication of the presence or absence of iron deficiency Vahlquist gives a series of "iron tolerance curves" in various conditions In a normal person the test dose causes a rise of serum iron to about 300 µg per 100 c cm in 4–6 hours, with return to normal level in 12 hours when fasting The serum iron is below normal in anæmia after hæmorrhage, simple hypochromic anæmia of adults and children, and anæmia accompanying infection In the first two a test dose causes a large rise in serum iron and after 12 hours the fasting level has not been regained , in the infection anæmia there is little response In pernicious anæmia the fasting level may be as high as 360 µg per 100 c cm and a test dose of iron causes little further increase after liver treatment the resting serum iron falls to normal or below, and some iron deficiency is not uncommon during the remission period The fasting level is also high in hæmolytic anæmias Waldenström[5] thinks that in clinical work serum-iron determination will be most useful in detecting iron deficiency He has described patients with epithelial symptoms, such as sore mouth and dysphagia, but no anæmia, who have been shown to be deficient by the iron-tolerance test and who have responded satisfactorily to large doses of iron—so called "latent sideropenia" The test is also useful in detecting iron deficiency in patients with a normochromic anæmia, in the remission phase of pernicious anæmia, and after gastric operations There is one more finding that may prove useful in acute hepatitis the serum iron may be raised as high as 370 µg per 100 c cm , whereas in obstructive jaundice it is unaffected Serum-iron determination then may take its place in the long list of biochemical tests for differentiating toxic and obstructive jaundice

This sort of technique has also been used to estimate the value of the various iron preparations now used therapeutically A test dose containing a standard quantity of iron is given and the change in serum iron followed Moore and others,[6] and Vahlquist, working on human subjects, found that ferrous salts were best absorbed, the rise in serum iron being unaffected by the absence of HCl in the stomach Ferric salts, together with reducing agents like ascorbic acid or sodium formaldehyde sulphoxylate, gave figures equal to ferrous iron ferric salts alone and other iron preparations were inferior They noted that food influenced the absorption of iron, a subject discussed by Tompsett[7] who thinks that iron is only absorbed in the ferrous state

Hahn, Whipple and their colleagues,[8] in their experiments with anæmic dogs on an iron free but otherwise normal diet, got different results They found the larger the dose of iron the smaller the percentage absorbed, so that it was best to give small divided doses When conditions were optimal absorption was just as rapid whether the iron was given as a ferric or ferrous salt or even in an organic combination The rate of utilisation of the absorbed iron was increased by previous iron feeding and by a diet of raw lean beef By far the best results were obtained by *intravenous* injection of colloidal iron How far these results on normal, temporarily anæmic dogs are applicable to abnormal anæmic men it is difficult to say The use of intravenous iron suggests that a really efficient preparation to replace the unsatisfactory injectio ferri (*BP*) is needed Enough has been said to show the usefulness of plasma or serum iron determinations The methods available are, however not simple, and for accuracy demand scrupulous cleanliness iron free reagents, and apparatus outside the usual range of laboratory equipment The most favoured methods are based on the technique of Heilmeyer and Plötner[9] A protein-free filtrate is prepared and the colour reaction between the iron in this filtrate and a substance like *o* phenanthroline is used for the estimation A photo electric colorimeter or similar electrical instrument is necessary for accuracy With these difficulties serum iron estimations are not likely to be popular, but to be too free with the tourniquet Potthof thinks they should be better prepared for the difficulties they will encounter on the scene of the accident It is common at English classes to see a learner holding his arm out nonchalantly for a colleague to splint One realistic practice where an accident is staged dramatically and the victim acts the part well, will teach more than a whole course of academic meetings A suitable exercise would be a bomb incident in which the victim was supposed to have sustained burns of the hands and face, a severe cut on the shoulder from flying glass and a compound fracture of the leg He must be brought down from an upstairs room over debris To make the exercise realistic it should be carried out in the dark with shielded torches

---

[1] *J Path Bact* 1941 53, 327
[2] Vahlquist B C *Acta pædiatr Stockh* suppl 5 1941
[3] Hahn P F , Whipple, G D et al *J exper Med* 1939, 69, 793 70 443
[4] Widdowson F M and McCance R A *Biochem J* 1937 31, 2020
[5] Waldenström, J *Nord Med* 1941 11, 2341
[6] Moore C V et al *J clin Invest* 1939 18, 553
[7] Tompsett, S L See *Lancet*, 1940, ii 365
[8] *J exper Med* 1940 71 731
[9] Heilmeyer, L and Plötner, K Das Serumeisen, Jena 1937

The lectures themselves should be succinct and practical It is a mistake to spend three-quarters of an hour on the anatomy of the skull and brain and ten minutes on concussion, not because the anatomy is irrelevant or useless but because the perspective is wrong It wastes the time of a first-aid worker to teach him details of anatomy, because he does not use them often enough to keep them fresh If he learns that the skull is something like a box made of ply-wood containing something like a pudding wrapped in a cloth he has a good working picture of the structure and can imagine what is going to happen when it is hit But he needs to be told again and again what the injury is going to look like, what it means for the patient and what he must do with his own hands The last he must learn by doing the right things again and again Clearly there is still no uniform opinion about what a first-aider should know, it has not been discussed enough Medical societies could help to establish standards by arranging discussions on first-aid teaching, at which members could exchange views and experiences, swap stories of common errors among candidates, and pass on mnemonics and suggestions for exercises These are no trifles Any of these dark nights the skill and conscience of a first-aid lecturer may mean the difference between survival and death for somebody, and if invasion comes the efficiency of our first-aid may turn the scale

CATARRHAL JAUNDICE

Virchow regarded "catarrhal" jaundice as due to obstruction of the lower end of the common bile-duct by mucus and debris resulting from a duodenal catarrh and associated cholangitis, and hence its name arose Of late years the conflicting view that it is a primary affection of the liver has been gaining ground This view was based first on the finding of an early indirect and then a biphasic van den Bergh reaction in the serum, indicating a mixture of obstruction to the bile and toxic damage to the liver cells, and on the demonstration of impaired liver function by such methods as the lævulose and galactose tolerance tests A F Hurst and C K Simpson,[1] in a widely quoted paper published in 1934, sought compromise in dichotomy They claimed that truly catarrhal jaundice resulting from a duodenal catarrh could be recognised clinically by the occurrence of anorexia, nausea and vomiting for a few days before the appearance of the jaundice, and could be distinguished from a primary liver affection in which the passage of bile in the urine and the jaundice itself were the first signs of disturbance Hurst regards the majority of cases in this country as belonging to the former group, while the epidemic in Sweden in 1936–37 was of the latter variety E R Cullinan,[2] however, doubted whether this apparently sharp distinction would stand scrutiny, and R S Aitken[3] pointed out that pre-icteric gastrointestinal symptoms are often recorded in cases of subacute or acute hepatitis proved at autopsy, as well as in cases of jaundice attributed to drugs Last year G M Findlay[4] reviewed the evidence that catarrhal jaundice, at least in its epidemic form, is a primary liver disease, quoting post-mortem records of 8 published cases in which were found degenerative changes in the liver cells, and round-cell infiltration in the portal tracts, with no changes in the bile ducts or duodenum He adduced as collateral evidence the occurrence of jaundice in people receiving injections of pooled human serum—convalescent measles serum in an example in this country and serum used in attempts at yellow fever prophylaxis in America This seems to show that a filter-passing agent exists which can cause an illness in man closely resembling catarrhal jaundice, but it does not throw direct light on the mechanism of the jaundice Further evidence came from Copenhagen in 1939, where K Roholm and P Iversen[5] obtained 38 small samples of liver by aspiration biopsy from 26 patients suffering from an "acute benign jaundice of the catarrhal type" They were sporadic, not epidemic cases, 18 of them had pre-icteric gastrointestinal symptoms The biopsies showed a diffuse "hepatitis" characterised by inflammatory phenomena with a predominance of mononuclear cells, destruction of the trabecular arrangement of the liver cells, necrotic disintegration of the parenchyma cells, and a varying proliferation of connective tissue The interlobular bile-ducts were normal, and Roholm and his colleagues concluded that the theory of a catarrhal pathogenesis was not tenable It seems more than probable, then, that in most cases of catarrhal jaundice, sporadic or epidemic, the pathological change is primary liver damage, and the agent may well be a virus An increased incidence of the disease is to be expected in war-time, and has already been recorded among the German troops in the south of France[6]

---

[1] *Guy's Hosp Rep* 1934, 84, 173

[2] *St Bart's Hosp Rep* 1936 69, 55

[3] British Encyclopædia of Medical Practice, London, 1938, vol viii p 104

[4] *J R Army med Cps* 1940, 74, 72

[5] *Acta path microbiol scand* 1939, 16 427

[6] v Hoesslin, *Dtsch med Wschr* 1941 67, 1060

"I should like to come on my knees, or any other way, to have the benefit of any one who may have experience on what to do about neuropsychiatric and alleged neuropsychiatric cases I am frankly disturbed by the number of people turned down Sometimes it does become a serious public relation when 40 per cent, as I know of in one place, of the people have been rejected because they presumably are individuals who might become or were neuropsychiatric If we get so that there are more than 51 per cent of that variety, I think the thing to do then is to have the kind of war that you can turn over to the majority, rather than expect the minority to wage it"—Brigadier General Lewis B Hershey, director of the Selective Service System *J Amer med Ass* Nov 29, 1941, p 1894 the ethyl-iodide method and it must be borne in ind that in cases with pulmonary congestion most ethods of assessing the cardiac output fail to give very ccurate results In his latest contribution to the bject Starr,[3] basing his conclusions on a study of ore than 1000 records made in several hundred patients uring the last five years, demonstrates the value of the allistocardiogram in the investigation of certain clinical roblems For instance, in congestive heart-failure the esults agreed with those obtained by more elaborate ethods in showing that the majority of patients with ongestive failure have subnormal circulations, and nprovement of the circulation often coincides with linical improvement On the other hand, many records ere obtained which demonstrated the presence of ubnormal circulations in patients with no evidence of ongestive failure The records in patients receiving igitalis demonstrated a well-marked if transitory mprovement in the circulation at a comparatively arly stage, before there was any clinical evidence of igitalisation and before the amount calculated to be ecessary to produce a full effect had been given When oo much digitalis had been given the record showed a efinite diminution in the size of the complexes, indicating a decrease in cardiac output The most impressive f Starr's records are those obtained in series from ndividual patients, such as those demonstrating the hange in the circulation produced by occluding the ffected limb in arteriovenous aneurysm, and the hanges which occur in various operative procedures in patients with unsuspected heart lesions It is refreshing n these days of steadily increasing complexity and elaborateness in apparatus to come across a method based on simple principles and so easily applied

GROUPS B, C AND G STREPTOCOCCI

Lancefield, later with Hare, has classified hæmolytic streptococci into a number of broad groups based on a precipitin reaction with a carbohydrate substance specific to the members of each group, and she has shown that most strains from human infections (sore throat, scarlet fever, cellulitis, erysipelas, puerperal sepsis) belong to group A Group B strains are primarily associated with bovine mastitis, group C with infections in the horse and guineapig, group D—present in dairy produce and the human intestine—is a hæmolytic variant of the enterococcus, and groups F and G are found in the human throat but G is also responsible for infection in the dog Less is known about the other groups so far identified (E, H, K, L and M), but it is unlikely that they are associated with human infections There is, however, increasing evidence that groups B, C and G may cause infection, usually mild but sometimes severe and fatal, in human beings, and many such infections occur in women after confinement or miscarriage The studies of Lancefield and Hare,[4] Taylor and Wright,[5] and others on puerperal infection have established that group A streptococcus is seldom present in the genital tract ante partum, that its presence there in the puerperium need not mean a severe infection (symptomless carriers have even been reported[6]), and that streptococci belonging to groups B, C, D and G may be present in the vagina both ante partum and in the puerperium

In 1938 Fry[7] reported 3 fatal cases of postpartum infection with group B streptococcus, in 2 of them the infection was an acute bacterial endocarditis, and in the third there was multiple abscess formation Since then, Hill and Butler[8] and Macdonald[9] in Australia, Rosenthal and Stone[10] in America, and now Ramsay and Gillespie[11] in this country, have reported 9 additional cases of bacterial endocarditis due to streptococci other than group A, all except Macdonald's 2 cases were post partum or post abortum The distribution of the 11 cases reported is 7 group B, 3 group G and 1 group C Acute bacterial endocarditis is a rare infection due to various organisms, but particularly the hæmolytic streptococcus, staphylococcus and pneumococcus Endocardial infection with group A streptococcus has in recent years been extremely rare, which throws into greater prominence these recorded infections with hæmolytic streptococci other than group A The duration of infection may be short—2 weeks—or as long as 3–4 months, antecedent valvular damage is not usually present and there is little or no response to sulphonamides Cases infected by group B, the commonest group in the series of 11, are characterised at autopsy by massive crumbling vegetations In cases infected by G and C the vegetations may be flat, raised plaques or more bulky and friable, and there may be some association between the character of the vegetations and the fibrinolytic activity of the causal streptococcus

Ramsay and Gillespie found 48 puerperal cases yielding streptococci other than group A among 1163 admissions to the L C C puerperal-sepsis unit at the North Western Hospital during the four years 1937–40 and have made a clinical and bacteriological analysis of them They found that 16 were group B, 12 C, 12 G, 6 D and 2 unclassified With 2 exceptions the infection was mild, and in a proportion of the cases it was doubtful if the streptococcus had any causal relationship to the pyrexia A high leucocytosis was a feature of the group G infections Although streptococcal infection (all groups) was much less common post abortum (12%) than post partum (35%) in their series, streptococci other than group A were recovered from 43% of the postabortum streptococcal infections and from only 9% of the postpartum streptococcal infections Probably the epithelium covering the genital tract suffers more trauma, and is therefore more susceptible to infection with the ubiquitous group A streptococcus, after full-term delivery than after abortion, moreover, the chance of exogenous infection from attendant doctor or nurse is greatest in the woman confined at term The investigation emphasises the value of Lancefield grouping, and demonstrates what is becoming apparent from other studies—that streptococci belonging to groups B, C and G may not be so innocuous to man as was originally thought

WHAT'S IN THE LOAF?

Mr ARTHUR WOODBURN, parliamentary secretary to the Secretary of State for Scotland, has drawn the attention of the Ministry of Food to criticisms of the National Wheatmeal loaf, and received the following reply, dated Dec 22, from Major G Lloyd George, parliamentary secretary to the Ministry.

There is certain difficulty in conveying in a Statutory Prices Order operative instructions as to production which have to apply to all types of flour mills, and it is for this reason that while in the Flour (Control & Prices) Order, 1941, there is a rather wide legal definition, the technical milling instructions have been conveyed to millers in a separate letter which is much more precise The retention of the wheat germ and the exclusion of the coarse bran are matters which have been dealt with in these instructions, and the minimum B_1 content and maximum fibre content laid down by the Medical Research Council are being used as standards in the tests which are made of National Wheatmeals from time to time It is admitted that variation has occurred in wheatmeal bread owing to the different methods adopted by millers and by bakers, but it is understood that in both industries considerable improvement has recently been made It is hoped that with the advice and help which the Ministry is giving them, all it is certain that the results of those workers who have access to suitable equipment will have an important influence on clinical ideas about what constitutes iron deficiency and how it should be treated

---

[3] Amer J med Sci 1941, 202 469

[4] Lancefield, R C and Hare R J exp Med 1935, 61, 335

[5] Taylor, J and Wright H D J. Obstet. Gynæc. 1930, 37, 216

[6] Cruickshank, R and Godber, G E Lancet, 1939, 1, 741

[7] Fry, R. M Ibid, 1938, 1 199

[8] Hill, A M and Butler H M Med J. Aust 1940, 1, 293

[9] Macdonald, I Ibid, 1939, 2, 471

[10] Rosenthal, A H and Stone, F M J Amer med Ass 1940 114 840

[11] Ramsay, A. M and Gillespie, M J Obstet Gynæc. 1941, 48, 569

INTRAVENOUS THROMBOSIS

AMERICAN writers have been studying intravascular clotting, particularly in the deep veins of the calf, as a cause of pulmonary embolism Hunter and others[1] made a post-mortem study of the condition of the veins of the calf in an unselected series of cases over a period of almost a year In autopsies on 351 adolescent and adult patients they found bilateral involvement of the veins of the calf in 110, unilateral involvement in 75 Thrombi formed in the veins accompanying the larger arteries far more often than in other veins and were present in the soleus muscle more often than in the gastrocnemius Fatal pulmonary embolism was responsible for 3 13% of all deaths in their series, and in 45 4% of the deaths from such embolism thrombosed leg veins were considered to be the most probable source Hunter and his colleagues maintain that, while no single cause can be held responsible for thrombosis of the leg veins, forced recumbency in adults who up till the time of an illness or operation have been active or at least ambulant is the chief predisposing cause Consequently they recommend early and repeated exercise of the lower limbs in bed, by which they mean active voluntary movements of flexion and extension of the feet, legs and thighs, not passive movements and massage, and they insist that these movements must start when the patient first takes to his bed, because clotting is liable to occur even within a few days They believe that even very narrow clots are capable, by curling up, of blocking quite large vessels

Ochsner and Debakey[2] distinguish between two types of intravenous clotting—thrombophlebitis and phlebothrombosis Thrombophlebitis is an inflammatory process, due to some type of local change in the vascular epithelium, resulting in most cases in adhesion of the clot to the vessel wall, in phlebothrombosis there is no local change but a general increase in the clotting tendency of the blood, due in the main to venous stasis and alterations in the cellular or chemical constitution of the blood The clots are non-adherent and for that reason more dangerous as a source of emboli Clinically, the inflammatory type of thrombosis is easier to recognise, being accompanied by fever, leucocytosis and tenderness along the course of the vessel In the non-inflammatory type the general and local manifestations may be so slight as to be missed altogether A rise in the pulse-rate and tenderness on deep pressure in the calf are all that can be hoped for as danger signals Ochsner and Debakey discuss the prophylaxis of intravenous thrombosis in surgical cases, re establishment of normal cardiovascular function and correction of anæmia and dehydration may help to counteract the general tendency to clotting Like Hunter, they believe that local stasis in the veins of the calf is an important contributory factor, and insist that the patient must be got out of bed early after major operations In this they confirm R T von Jaschke's[3] finding that among 300 patients who were allowed to get up relatively late there were 2% of after-operation thromboses and 1% of fatal emboli, whereas in 387 cases in which early ambulation was encouraged the incidence of thromboses was 0 5% and there was no fatal embolus In the Giessen University Clinic, the advantages of getting the patients out of bed between the second and the fifth days were shown by a fall in the incidence of thrombosis from 2 6 to 1 7%, and of fatal embolism from 1 4 to 0 6%

In discussing the nature of the circulatory interference in the thrombosed limb Ochsner and Debakey point out that in deep thrombosis—for example, in the femoral vein—the limb is white or cyanotic and cold The coldness and pallor are not what one would expect in the presence of an inflamed vein, and are in contrast to the heat and redness accompanying thrombosis in the superficial veins The appearance is in fact due to ischæmia, and observations suggest that vasospastic impulses arise in the thrombosed segment of the vein and cause contraction of arterioles and venules elsewhere in the affected limb Experiments on animals have convinced these workers that the lumbar sympathetic ganglia are involved in the reflex, and they therefore treat cases of severe thrombophlebitis by lumbar sympathetic block The œdema of the limb is due to increased filtration caused by the rise in venous pressure as well as by anoxæmia of the capillary epithelium which is thus rendered unduly permeable The loss of the pumping action of the arterioles is also a factor Lumbar sympathetic block produced by injection of 1% procaine hydrochloride along the lumbar-sympathetic chain has the effect, they say, of dramatically relieving the pain, and of causing the œdema to disappear The perivascular fluid is carried away by restoration of the arteriole pulsation

BALLISTOCARDIOGRAPHY

IT is getting on for 40 years since Yandell Henderson[1] recorded, by means of a swinging table and a system of levers, the movements imparted to the human body by the impacts of the blood and suggested that there might be a definite relationship between cardiac output and the amplitude of these movements Starr has made a close study of the subject and in 1939 he concluded that this is the "simplest, easiest, and most rapid means of estimating the cardiac output that has been proposed" The ballistocardiograph, as it is called, consists merely of a suspended table braced to prevent motion in any but the longitudinal direction, motion in this direction being opposed by a strong spring The movement of the table is magnified 8000 times and recorded photographically The principle is simple As the heart drives the blood towards the head it propels the body in the opposite direction This is immediately followed by a series of forces arising out of the blood striking the arch of the aorta and the curve of the pulmonary artery, and the downward movement of the blood in the thoracic and abdominal aorta, these forces drive the body towards the head The normal record thus show a sharp downward deflection (I wave) immediately followed by a sharp upward deflection (J wave) These two definite systolic waves stand out in contrast to the smaller, more variable waves which occur during diastole With certain reservations the amplitude of the I and J waves corresponds to the cardiac output, which is estimated from measurements of representative high and low complexes Among the physiological factors which alter the size and shape of the record are body size, large people having larger absolute cardiac outputs than small ones, age, the curves being smaller in old age, and heart rate In investigating pathological conditions other discrepancies appear such as the difficulty in obtaining measurements in the presence of arrhythmias, the fallacy introduced by the presence of regurgitant heart valves, and the gross movements caused by the diaphragm in the presence of dyspnœa In spite of all these drawbacks, however, the ballistocardiogram may be of considerable value So far as the actual estimation of the cardiac output by this method is concerned, Starr and his colleagues[2] have found that the results compare reasonably well with those obtained

---

[1] Hunter, W C, Sneeden, V D, Robertson, T D and Snyder, G A C *Arch intern Med* 1941, 68, 1

[2] Ochsner, A and Debakey, M *New Engl J Med* 1941, 225 207

[3] *Chirurg*, 1937, 9, 274.

[1] Henderson Y *Amer J Physiol* 1905, 14, 287

[2] Starr, I Rawson A J, Schroeder, H A and [illegible] *Ibid* 1939, 127, 1

Special Articles

DUST DISEASES IN RUSSIA

UNTIL the last few years silicosis has never attained the importance in Russia that it has in the west, for the industry of the country was mainly agricultural But the vast development of heavy industries in southern Russia and beyond the Urals has brought with it the industrial diseases with which we are unhappily familiar. A great deal of useful research on the dust diseases, mostly among coal-miners, has been done by the Donets Institute for Labour Hygiene and Occupational Diseases and some of this is summarised in a series of papers which has reached England through the Soviet Embassy These cover the clinical, environmental and experimental aspects, and show a thorough familiarity with the mass of western work on the subject They are supplemented by a monograph on tuberculosis and pneumoconiosis among underground workers by I I. Moshkovsky

The plan of this Ukrainian research resembles that of the M R C investigation in South Wales and there are many points in common in the findings in the Donets and those reported by Cummins and Sladden[1] and Gough[2] from South Wales There is the same distribution of pneumoconiosis between the soft coal and anthracite fields, with the latter suffering far more heavily, the same surprising lack of any special tendency to tuberculosis among miners, and the same slow development of a disabling chest condition in a proportion of the older miners The numbers of miners who have been investigated are also roughly comparable. he development of pneumoconiosis described by M. B ipinsky is characterised by the usual increase in X-ray ensity of the network of the lung structure widening f the root shadows, sclerosis of small and large bronchial alls, and the appearance of nodules which gradually ncrease in size and number Finally the nodules run ogether and emphysema develops Thickening of the leura and bronchiectasis are not uncommon.

The view generally held in England and America is hat silicotic nodules result from the presence of silica All silicotic tissue contains excess silica, though the everse is not necessarily true[3] Whether the nodules ound in the lungs of coal-miners are of the same etiology has not been finally decided Most observers ake the view that it is the silica in the coal that does the damage and that the coal itself acts chiefly as a diluent. The coal-dust may by its very mass have some mechanical effect on the lung but is not thought to have any specific effect like silica Badham and Taylor[4] dissent from this view, and in an elaborate investigation on Australian coal-miners demonstrated that coal-dust tself cannot be disregarded as a factor in producing nodules Among the Russian workers V A Ravvin and P A Emakov believe, on experimental evidence, that coal-dust as such (and *not its mineral admixtures*) is the basic factor which determines the *changes* in the lungs in occupational anthracosis This conclusion is a highly important one, and it will be interesting to see if the research being done as part of the M R C investigation confirms it

PREVENTION

Experience in South African mines has been closely studied in Russia and D E Shlimovitch and A V Heimar agree that the pneumatic drill is chiefly to blame for generating dust, and that wet boring, good ventilation and correct handling of explosives are needed to suppress it Heimar finds that electrolytes and naphtha and resin soaps increase the dust-settling powers of water sprays, in this he differs from the Coal Dust Research Committee in its 1941 report but both agree that dust can largely be controlled by the intelligent use of sprays The public-health measures in the Russian mines seem to have been outstandingly good All applicants were medically examined and only those of favourable physique were accepted, examinations were repeated regularly, workmen when necessary being transferred to lighter jobs Medical and sanitary services were close to the place of work, so that help could be given quickly in case of accident and the health of the workers was kept constantly under observation Hot and cold showers and facilities for drying and changing clothing were provided at all collieries Workers were supplied with special garments for mining and did not return to their homes in the clothes worn on their working shift They were given a free allowance of milk daily a month s holiday every year and were liberally treated over hospital care, insurance and pensions All this good work prospering only a few months ago, must have been suspended by destruction in the Donets coal-mining industry

---

USE OF X RAYS IN MANIPULATING FRACTURES

IN both Britain and the United States there has been an increasing number of casualties among surgeons using X rays, and the British X-ray and Radium Protection Committee have therefore drawn up the following memorandum

There are two ways in which X rays may be used in the manipulation of fractures of the extremities The first is by screening or taking radiograms (which can now be processed very rapidly) when the surgeon believes he has attained correct position, radiography should be the usual procedure adopted, and should involve no exposure of the hands or person to a direct beam of X rays The second is by actually manipulating the fracture under fluorescent-screen control This inevitably produces conditions of grave risk and cannot be rendered safe for the surgeon s hands must at times come into the direct X-ray beam Only in exceptional cases should the second method be adopted and then only on the responsibility and under the direction of the senior surgeon, such work should never be delegated to juniors The same considerations apply to the removal of foreign bodies under X rays

ESSENTIAL PRECAUTIONS

The operating room should be satisfactorily darkened Lights should be dimmed as far as possible before screening, and no lights should face the surgeon The previous films on the case should be seen and memorised. and not scrutinised in a bright viewing box immediately before the manipulation. The surgeon must prepare his eyes for screening This takes a certain amount of time varying with the individual, but a minimum of five minutes in the dark should be allowed Alternatively a single red light may be used in the room or the surgeon may wear dark (preferably red) goggles for some minutes before screening is begun

The X-ray apparatus should be operated by a radiographer who has been specially trained for this work He should be given definite instructions by the radiologist as to the limits within which he must use the apparatus. These limits should be governed by hard and fast rules, drawn up by the radiologist in conjunction with the surgeon in charge and not to be varied because a surgeon finds himself in difficulty The radiographer should keep a log book recording the factors with actual times of screening This book should be signed by the surgeon after each operation, and should be inspected regularly by the radiologist

In general the recommendations of the British X-ray and Radium Protection Committee should be followed

The tube screen distance should not be less than 20 or more than 30 in The apparatus should be set to give not more than 65 kV For thin parts and children a lower kilovoltage will be adequate *The maximum screening current that should be used is 3 mA* As a safeguard against excessive screening current, an automatic cut out can be incorporated in most X ray sets at a small cost, this will come into operation if the selected factors are exceeded

All apparatus should be shock proof An aluminium filter of 1 or 1 5 mm should be fixed in the aperture of the X ray tube so as to furnish a total filtration of not less than 2 mm of aluminium Cones or cylinders to limit the X ray field are essential, these should be of such size that the illuminated area falls well within the limits of the fluorescent screen An illuminated area of 5 in circle, or 4 in by 6 in

---

[1] Cummins S L and Sladden A F *J Path Bact* 1930, 33, 1095
[2] Gough J *Ibid* 1940 51 277
[3] King E J and Belt T H *J Path Bact* 51 269
[4] Badham C and Taylor H B *Ann Rep Dept publ Hlth New South Wales* 1936 No 19 p 100, 1939 No 20, p 18

National Wheatmeal will conform strictly to the required standards, both as to vitamin B_1 and fibre The latest test by the Ministry of samples drawn from all parts of the country show that 75 per cent of the output of wheatmeal is up to standard Minor differences of colour are unavoidable, due to variations in the wheats ground

Lord Woolton is taking every possible step to help millers and bakers in this matter without interfering unduly with the maintenance of essential supplies This especially applies in connexion with the smaller country mills which it is desired to keep in constant production and which have experienced considerable difficulties

The position appears to be that the Ministry of Food issued a statutory order so loose as to permit a mixture of white flour and bran being made into 85% flour That was an order and had to be obeyed In addition they gave supplementary instructions to the millers which, if obeyed, would result in the production of an 85% extraction flour as intended by the Medical Research Council, but it was not compulsory to obey these The smaller firms mostly obeyed both order and instructions, but a few larger firms disregarded the instructions and respected the statutory order only Major Lloyd George's letter suggests that millers are now adhering more closely to the supplementary instructions, and the quality of national wheatmeal should therefore improve Certainly some disinterested body should be watching the composition of the flour

MENTAL STATES IN OLD AGE

It does not make for progress when clinical medicine becomes subservient to the autopsy findings This is well illustrated by G W Robinson,[1] who points out that, on pathological grounds, the mental states of old age have in the past been attributed either to arteriosclerosis or to senile atrophy of the brain, and both conditions being progressive and irreversible, the physician's task has seemed purely custodial This idea persists, although research has shown that the correlation between clinical symptoms and structural changes in the brain is, to say the least, dubious Severe senile and arteriosclerotic abnormalities are found in the brains of elderly people with no history of mental symptoms, and the intensity of mental symptoms does not correspond to the degree of damage found post mortem The mental picture of elderly patients shows a great variety The deterioration of memory and intelligence characteristic of senility and arteriosclerosis is often difficult to assess, because emotional symptoms or excitement and confusion interfere with the application of the usual clinical tests Every criterion which will help to disentangle this mixed group of psychoses must be welcome to the clinician It was Krapf[2] who introduced a more functional view of the circulatory disorders of the brain by studying psychoses in hyperpietic patients He described two types of psychotic symptoms in close association with increase in blood-pressure twilight states with confusion, and affective episodes similar to those observed in epileptics Both syndromes are transient, lasting a few weeks or some months at most and ending in restitution except when an apoplectic seizure occurs He also found characteristic personality changes associated with hypertension, distinguishable from those in arteriosclerotics and seniles These proved to be reparable to some extent and their functional nature was evident from the observation that the patient could seem his former self for a short time under the pressure of an emergency Robinson reviews other work having a similar bearing H E Clow, for instance, found an unexpectedly favourable prognosis when he analysed 100 cases of psychoses accompanying cerebral arteriosclerosis He did not differentiate hypertensive from arteriosclerotic cases, but he went carefully into their history and discovered, in most of them contributory physical as well as psychological factors upsetting the limited adjustment of the person with an arteriosclerotic brain and precipitating the psychosis No less than 49 of his patients returned home after having been treated by psychotherapy combined with the application of general principles of internal medicine There seems to be justification for revising the diagnoses of arteriosclerotic and senile psychosis and for restricting their use, it may be, as Robinson suggests, that "the conditions diagnosed as arteriosclerotic insanity are really toxic delirious reactions" In his own series of 50 patients over the age of sixty, 35 recovered sufficiently to return home, when he followed up 20 of these after six months only 2 had relapsed and 1 had died Among other procedures, he treated all depressive states with convulsions induced by leptazol, irrespective of age, one of his patients being eighty-four when he gave him epileptic fits This seems rather rough handling, but in view of the successful treatment of involutional melancholia by the same method—confirmed by many critical observers—there seems to be no reason for setting an age limit The problem of psychiatric diseases among the elderly will become more urgent with the shift towards longevity in the population which will probably be even more pronounced after the war The present wave of therapeutic activity in psychiatry seems to offer some hope for a group of invalids who, till now, have been relegated indefinitely to institutions

---

[1] *J Amer med Ass* 1941, 116, 2139

[2] Krapf, E Die Seelenstorungen der Blutdruckkranken Vienna, 1936, *J ment Sci* 1937 83, 534

BETWEEN SISTER COLLEGES

The Royal College of Surgeons of England has just received a gift of £2000 from the American College of Surgeons to help towards its restoration This spontaneous gesture of sympathy immediately followed the account of the damage done by enemy action in Lincoln Inn Fields given by Surgeon Rear-Admiral Gordon Taylor when he attended the recent congress of the American college A further sum has been allocated to cover the cost of an appeal to U S surgeons to assist in the restoration The gift is a landmark in the history of the college and a cement that will bind still closer the ties of friendship initiated during the last war, when a replica of the silver-gilt mace was presented to the American college by British consulting surgeons to the Forces The gift of American surgeons is being used to meet some of the immediate difficulties with which the English college is faced The library is being reopened and the lecture courses, until now enjoying the hospitality of RSM House, resumed Offers of help have now been received from all parts of the world, and with such general sympathy and assistance the college council feel no doubt of their ability to restore their buildings and to make their museum once more worthy of the headquarters of British surgery

Dr Graham Steell, emeritus professor of clinical medicine in the Victoria University of Manchester, died in London on Jan 10, at the age of 90

We also regret to announce the death on Jan 8 of Mr Oswald Addison, emeritus surgeon to the West London Hospital, and consulting surgeon to the Hospital for Sick Children, Great Ormond Street

Postgraduate Lectures at Edinburgh—During the spring term the following Honyman Gillespie lectures will be held on Thursdays, at 4 30 P M, at the Edinburgh Royal Infirmary Jan 22, Dr Harold Scarborough, the vitamins in relation to hæmorrhage, Jan 29, Mr J M Graham, the surgery of the hypopharynx (pharyngeal pouch), Feb 5, Dr W F T Haultain, œstrogenic therapy, Feb 19 Mr K Paterson Brown acute intestinal obstruction, March 5 Mr David Band, urogenital tuberculosis, March 19, Dr Douglas Miller, the albuminurias of pregnancy suitable for prefrontal leucotomy, but more work was needed to assess what value such a remission had as an indication In his series, 5 of the 7 patients who benefited from operation had shown temporary improvement after electrical therapy Where the patient was demented or mentally deficient benefit could not be expected from the operation it could only be hopefully applied in cases of mental disorder He believed that after the operation mental function became reorganised And though he thought it likely that in years to come the method would be regarded with either laughter or horror, it was at present giving results in cases which otherwise seemed hopeless, and he proposed to go on doing it until some better method was found

SCOTLAND

CANADIAN ORTHOPÆDIC UNIT

In the closing days of the year Scotland welcomed to its shores an orthopædic unit specially sent by the Canadian Red Cross in response to an appeal for assistance of this type Since the last war orthopædic provision in Britain has been considerably developed, but it is true to say that in this, as in other fields of hospital activity, Scotland has tended to lag behind England There have certainly emerged several excellent centres of orthopædic activity north of the Tweed, and of recent years the development of fracture clinics has tended to promote a wider interest in orthopædic care, but such efforts as there have been have been sporadic and largely dependent on individual enterprise and initiative The creation of new emergency hospitals up and down the country has made many additional beds available, and it is well known that orthopædic units have been created in several of these new hospitals It is probably no exaggeration to say, as Dr Davidson said in welcoming the Canadians, that now for the first time Scotland has prepared a foundation on which to build a complete orthopædic scheme Scotland's main problem in developing orthopædic work has been to secure trained personnel, and the arrival of the Canadian unit is bound to be of considerable assistance in this direction, not merely in terms of numerical value but because the unit may well come to act as a centre for the training of yet more personnel, and must in any case foster a new interest in the whole question of orthopædics It is understood that it is proposed to make this Canadian unit responsible in the first instance for some 300 or 400 beds in a hospital in central Scotland, where there are already orthopædic cases under treatment, and it will be instructive to watch the differences in outlook and differences in method The Canadian nurses, for instance, are probably accustomed to eight-hour spells of duty and to shorter term of night duty than those usually prevailing in this country But growing pains are healthy, and this Canadian gesture will receive a very general welcome Dr A B Le Mesurier and Miss Hunter will be making an important contribution to war surgery, they will also be forging another link between Scotland and the Dominion which will long outlive the war

A WATCH ON THE WAR EFFORT

The Secretary of State for Scotland hopes to tighten up measures for the protection of health in workshops There is already some evidence of a heightened incidence of disease, notably tuberculosis, among young workers General practitioners have been invited by the Secretary of State to seek the cooperation of his department in dealing with the observed reaction of war conditions on health Doctors are asked to refer patients in this category to the regional medical officer with a view to a thorough overhaul, with recourse if necessary to hospital and convalescent beds In the first instance the scheme is being applied to the industrial areas of Clydeside—the city of Glasgow and the counties of Lanark, Dumbarton and Renfrew Before the war the Department of Health made an investigation into incapacities of three-months duration, and the present approach may be regarded as a sequel of that earlier work, made possible by the increased number of hospital beds available under the emergency casualty scheme This is an experiment, as the Secretary of State remarks, which may lead to big things

In England Now

A Running Commentary by Peripatetic Correspondents

"If only we had been at home, now," we said, "we could really have done something about this paper collection, but evacuees like us simply haven't got any waste paper or waste anything" Yet when we turned to on Sunday afternoon there seemed quite a lot after all For quick results, we found there is nothing like books It takes something like ten out-of-date receipts to make an ounce of waste paper, and those medical journals that we always mean to get bound some day but there are some numbers missing tot up to only 7½ oz each But a good out-of-date textbook or instrument catalogue tips the scale at anything up to 7 lb, and even Recent Advances weigh a pound and a half. In sweat per ounce books come out far the lowest, for it takes little longer to decide to part with a textbook of our youth than with an unanswered letter of our youth, and one may outweigh the other by half a stone If you are pressed for time, then, our advice would be "Tackle your Bookshelves First," bearing in mind that the Forces (through any post office) can make better use of readable fiction than even the Minister of Supply

* * *

Of course I ought never to have been asked to examine the village Red Cross women in first-aid, or perhaps I ought never to have accepted the honour, but I am always apt to jump recklessly on to any bus that is passing so as not to miss it Seven years ago, when I was last in general practice, it was all much simpler There was a tacit understanding that at least 80% of the candidates must be passed A lower percentage was apt to sap local enthusiasm, besides being a nasty let-down for the colleague who had done the lecturing From the lecturer one usually ascertained which of the old trouts could be ploughed safely without wrecking the whole outfit, and all was gas and gaiters Nowadays it is a much more serious matter, and quite rightly so I received a list of questions, some simple for the novices, and some more exacting for the certificate-collectors That was all right Under each question was a reference to the exact page in the Manual where the clever examiner could look up the right answer beforehand (or surreptitiously on his lap below table-level in an emergency) No My troubles arose when we wandered from the point "But supposing that weren't sufficient to stop the hand from bleeding?" I asked incautiously "Apply a tourniquet to the brachial artery," was the prompt reply Now my dispenser had primed me that the Mobile Unit had had a printed Government circular warning the members never on any account to use a tourniquet (She couldn't and didn't attempt to reconcile this with the parcel of tourniquets they received less than a fortnight later Perhaps the parcel was the work of a fifth columnist or an *agent provocateur*) So I said very mildly, "Hm Ever heard of Pad and Flexion?" The candidate was horrified "Oh yes, but we must never do that, we've had to cross that out of our books"

Supposing the Mobile Unit is called out to an incident in that village and has to collaborate with the First-Aid Point, who is going to win? Will they thresh the matter out while tired fingers maintain digital pressure? Or will they adopt both procedures fifty-fifty in a true scientific spirit of inquiry and see which patients do the better?

My dispenser, on seeing the questionnaire, remarked sardonically, "Lucky for you that you didn't have to ask the latest treatment of burns" I quite agree

* * *

It is my present lot that I have to make rather frequent railway journeys between what, after an air-raid, the authorities term a "north-west inland town" and London I have always regarded railway journeys, even those long ones such as the Trans-American or Trans-Australian, as periods of perfect rest To me the joining of a train on a journey is the next best thing to joining ship The moment when we are all settled down and the guard waves his green flag and blows his whistle is to me almost as good as seeing the last rope cast off the last bollard and watching the widening interval rectangle, is ample for this type of work. The radiographer should constantly watch to see that the X-ray beam is kept within the limits of the fluorescent screen. It is his duty to point it out to the surgeon if this essential factor is not complied with. If the X-ray tube and screen can be coupled to ensure this, it is a major safeguard which should be adopted. An integrating time switch is useful. All exposures should be made with a timing device. The fluorescent screen, faced with lead glass, should be of modern manufacture and in good condition. It must have handles that afford protection to the hands. A mechanical device for holding the screen is, however, preferable.

Under these conditions screening and radiography between manipulation can be carried out safely, provided always that the hands of the operator or of the assistant who holds the screen or films do not come within the direct beam.

DANGERS OF SCREENING

Manipulation of fractures under screen observation should only be employed in very exceptional cases, preferably, if possible, with a radiologist in attendance. The time occupied in such manipulation should be strictly limited to 1 min., and this should be accurately computed by the radiographer in attendance. It should be recognised that even with one rapid manipulation with the hands in the direct beam, the safety tolerance dose may be considerably exceeded. *If the surgeon is willing to take this risk, it is entirely on his own responsibility.* In the direct beam the exposed hands are subject to the daily safety tolerance dose in the prescribed conditions in about 2 sec. at 20 in. At shorter distances—e.g., when the reflecting fluoroscope is employed—the hands are nearer the tube and the dose is increased.

The cryptoscope (the fluorescent screen fitted to the head and supplied with a hood) is a very dangerous device, and should never be used.

Operating conditions vary greatly in different hospitals, and each should draw up its own set of regulations. A list of specific safety instructions should be posted in the department concerned.

MEDICINE AND THE LAW

A Death after Phenothiazine

AN inquest was held on Jan. 2 in Birmingham on a girl of 6 years who died of acute hæmolytic anæmia after taking phenothiazine tablets for suspected threadworms.

When the mother was visiting her doctor a month ago she mentioned that her little girl had some itching of the anus at night, though otherwise in good health. No worms were seen by either the mother or the doctor. The doctor gave the mother 24 half-gramme tablets of phenothiazine and told her to give one four times a day. The child was attending school. She took three tablets on Dec. 13 and four daily on the 14th, 15th and 16th. On the 17th the mother noticed that the girl was pale and gave her only two tablets. This made a total dosage of 8.5 g. and the drug was then stopped. On the 18th the child had a mild headache and her face looked slightly yellow. The headache persisted until the 20th, but she still attended school. On Dec. 21 (Sunday) her mother left her in bed and told the doctor on the telephone that she was still pale; he ordered 3 teaspoonfuls of syrup of figs. Next day (22nd) the child vomited, and she stayed in bed. On the 23rd she was taken to the doctor's surgery and he sent her at once to the Queen Elizabeth Hospital. On admission there she looked pale and very slightly jaundiced; her temperature was 101° F. and pulse rapid. A blood-count showed: red cells 1,250,000; hæmoglobin 26%; white cells 16,850; normoblasts 1%; reticulocytes 22.6%; platelets 236,000 per c.mm. On the 24th she was given a drip transfusion of 10 oz. of whole blood in 3 hours. This was followed by a rigor and rise of temperature to 106.8° F. and of pulse-rate to 160. She gradually became unconscious and died at 3 A.M. on Dec. 25, about 12 hours after the transfusion.

At autopsy Prof. G. Haswell Wilson found the child was fairly well nourished, with a just perceptible jaundice of the skin and conjunctivæ. Apart from pallor the heart and lungs showed nothing of note. The liver was pale, but there was nothing in the gross appearances to suggest a toxic hepatitis. The spleen was firm and dark red. The alimentary tract showed no abnormality. The brain contained multiple small hæmorrhages in the region of the corpus callosum. The rib marrow was watery and dark, and the femur marrow abundant and dark. Sections of liver, heart and kidneys showed no microscopical evidence of toxic damage. Professor Wilson considered the appearances of the blood, spleen and marrow consistent with a hæmolytic anæmia; he found nothing to connect the blood-transfusion with death.

SURGERY IN MENTAL DISEASE

DELIVERING a Hunterian lecture at the Royal College of Surgeons on Jan. 12 Mr. F. W. WILLWAY described his technique in prefrontal leucotomy. He carried it out, he said, with the patient under intravenous 'Pentothal' and local anæsthesia. The trephine openings were made on each side, 3 cm. behind the anterior margin of the outer rim of the orbit and 5 cm. above the zygomatic process, and the white matter of the frontal lobe was divided with a flat-bladed knife. There was danger of damaging the branches of the anterior cerebral artery, and he had lost one case by this accident. In undertaking any operation, however, the surgeon had to weigh the operative mortality against the seriousness of the complaint and the prospect of relief. The chief risk to mentally disordered patients subjected to prefrontal leucotomy was that they would fail to improve; none of the survivors had so far been made worse by the operation. Of the published cases summarised by Dr. E. Lilian Hutton,[1] 46 had been done by Moniz, the originator of the operation, with no deaths. In his own series of 16 cases, Mr. Willway said, there had been 2 deaths: that already mentioned, and another due to bronchopneumonia and cardiac failure. There had been apparent recovery in 7 cases, 4 had not improved and in 3 it was too early to give an opinion. Of McKissock's 2 cases, 1 had apparently recovered and 1 had not improved. It was impossible at this stage, he said, to speak of more than apparent recovery, since the histories were still too short for any certain opinion. Cure depended as much on the after-treatment and on postoperative rehabilitation as on the operation. Before operation most of his cases had been uncooperative or inaccessible, and had had courses of electrical therapy to which they had responded for a time. He showed a film of the operation, and photographs of a brain on which the operation had been performed post mortem; the whole depth of the white matter of the frontal lobe was seen to be divided. He then reviewed his series of 16 cases. Of these, cases 1–7 and case 9 have already been reported in our columns by Dr. Hutton[1] and she described case 10 at a meeting of the Royal Medico-Psychological Association last November.[2] Case 8 was that of accidental death already noted.

CASE 11.—A girl of 20 with 8 years' history of schizophrenia. Habits dirty; dangerous at times. Had had a remission lasting a month after electrical therapy. After operation in August, 1941, her hallucinations disappeared, her work began to improve and her behaviour, though not her mental state, is now normal. She is a quiet and happy inmate of the hospital.

CASE 12.—A woman of 28 who had had schizophrenia for 4 years. She had had shock therapy. Seven weeks after operation in July, 1941, she was able to travel home alone to Yorkshire, and her family find her quite normal.

CASE 13.—A man of 36, a D.Sc., with 10 years' history of paraphrenia. In 1935 he committed a brutal murder. After prefrontal leucotomy in October, 1941, he was at first much improved, but he has since behaved suspiciously from time to time.

CASES 14, 15 and 16, Mr. Willway said, had only had their operations during the last two months, and though it was too early to give an opinion on the effect, he hoped for recovery in at least 2 out of the 3.

The longest case showing apparent recovery had now been well for 14 months since operation, and this was longer than his longest previous remission. There had so far been no postoperative epilepsy in any case. At present if electrical convulsion therapy gave a temporary remission, it was taken as an indication that the case might be

---

[1] *Lancet*, 1941, ii, 3.

41, ii, 739.

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS M P

THE House met on Jan 8 the earlier date insisted on by the Commons as against the Government's proposal of a longer recess, and the occasion for the meeting was all too clear. *The grave position in the Far East is one that demands the attention of Parliament no less than that of the Government.* It is all the more necessary that Parliament should have the opportunity of freely expressing its views and its criticisms and demanding information because the ordinary machinery of Opposition is in abeyance. Criticism the Government got but information the Government did not give at least not in the quantity the House desired. As the *Times* somewhat acidly remarked Mr Attlee's statement given in the absence of the Prime Minister "could hardly have been more economical of information." Many members evidently did not expect much information for although the House was very full at question time it was for a major Government statement, relatively thin when Mr Attlee was speaking.

The speech was a political rearguard action fought by the Government against expected criticism and awaiting the reinforcement of the Prime Minister on his return from conferences in Canada and the U S A. Mr Attlee said, "It is difficult to appreciate just what the scale of the war is in the Far East," but the possibility of "a sudden attack by Japan ... has been present in the minds of the Government since we took office." In referring to the question of an imperial war cabinet and a supreme war council, Mr Attlee said it would be a mistake to assume that the 1917 organisation would necessarily suit the conditions of this war. The speech in fact, did not contribute much to the discussion, and in particular it did not deal with India which is threatened by attack from Japanese forces.

* * *

The position of India, and especially its political position, had figured prominently at question time, but Mr Amery gave very little encouragement to those hoping for a solution of the political deadlock. In answer to Mr Graham White, Mr Amery said that he could not discover in the resolutions passed by leading political parties "any satisfactory response to the Viceroy's recent appeal for unity." Major Milner asked whether the Secretary of State would not take some active steps himself, and Dr Haden Guest drew attention to the appeal addressed to the Prime Minister by Mr Srinivasa Sastri, Sir Tej Bahadur Sapru and Mr Mukund Jayakar (members of H M Privy Council) and other Indian moderates who had created "a new centre and rallying point in Indian opinion" (an appeal backed up by the *Times*) but Mr Amery merely replied that it would receive "every consideration." It was clearly in the minds of members that an India coöperating in the war effort would be an asset to our strength material and moral, comparable with the U S A. India is now a great manufacturing area for certain munitions but should have been by this time much more developed, and the problem of Indian government should have been resolutely tackled. The British Government's attitude to India—to which dominion status has been promised in any event—is causing grave concern in the U S A.

* * *

The statement of Mr Curtin prime minister of Australia, which was a downright criticism of the British Government was warmly approved in private by many members—probably a majority in the House—and was explicitly approved by several speeches in the debate. To the creation of a general war council essentially consultative as distinguished from an essentially executive empire war cabinet we shall come, and on this council India should be represented on a footing of equality with the Dominions. There should be in addition meetings of the representatives of the whole of the United Nations to discuss matters of immediate and of post-war concern.

It is clear that the Government cannot postpone much longer a fuller statement of "peace aims" than those contained in the Atlantic Charter and those that emerged from the sitting of the Allied Council at St. James's Palace when Mr Maisky declared the adherence of Russia to this pact. Details must be left for the future but one matter is due for careful and public discussion now—namely, the method by which armed force will be controlled after a peace settlement. The arrangement must be one under some form of international control and the armed forces of individual nations under their own control must be severely limited to those required for police purposes. Unless this international control is brought about—and it is one bristling with difficulties—there is no prospect of the world escaping from the threat of another great war.

QUESTION TIME

Bread

SIR ERNEST GRAHAM-LITTLE asked the Parliamentary Secretary to the Ministry of Food whether any firms, other than Roche Products, Ltd, had been approached to supply synthetic vitamin B_1, for the Government fortified loaf and to what extent this monopoly of manufacture, continuously enjoyed by a single firm restricted the supply of the fortified loaf which, 18 months after its general provision was promised, remained available for less than 25% of the population.—Major G LLOYD GEORGE replied that two new factories had been acquired, equipped and financed by the Ministry for the manufacture of aneurin for fortifying white flour. Arrangements were proceeding as rapidly as present conditions permit for the production of synthetic vitamin B_1 at these two factories, but it is not expected that they will be in production for 18 months. In the meantime supplies are being received from the United States as well as from the company which is manufacturing in this country. The scheme for the fortification of white flour with vitamin B_1 will be extended to the north-west area next week and the result of this extension will be that approximately 50% of white flour consumed in the United Kingdom will be fortified.

SIR E GRAHAM LITTLE What penalties are provided for breach of the instructions issued by the Ministry for the manufacture of the national wheatmeal loaf, what machinery exists for the exposure of such offences comparable with that which deals with adulteration of food, and have any prosecutions been instituted?—Major LLOYD GEORGE The instructions for the manufacture of the national wheatmeal loaf are contained in the Bread (Control and Maximum Prices) Order 1941, S R & O 1542. An infringement of this order would be an offence against the Defence General Regulations and, as such, punishable by imprisonment or fine or both. The enforcement of this and other orders made by my department is undertaken by the Ministry itself through its divisional and local organisation.—SIR E GRAHAM LITTLE How many prosecutions have been instituted by the department in respect of breach of its orders or instructions regulating the composition of bread sold under the designation of national wheatmeal; and what was the date, place and result of such prosecutions?—Major LLOYD GEORGE Up to the end of November, which is the latest date for which figures are available, there have been no such prosecutions.

Mr W LEACH Is Major Lloyd George aware that bread cakes and puddings, made of the white flour now being issued to bakers and the public, can only be kept for a very few days, and can he explain why some of the bread made with this flour has turned green when kept for a few days?—Major LLOYD GEORGE No information of the circumstances mentioned has reached the Ministry. I shall be pleased to investigate any incident of the kind.

Rehabilitation of the Injured

Replying to Mr HENRY STRAUSS, Mr. E BROWN said It is one of the first considerations of the Emergency Hospital Scheme to ensure that the injured person is as fully restored to normal function as his injury allows, before discharge from hospital. To that end the scheme includes a widespread organisation of special treatment centres for fracture and orthopædic cases, providing as part of remedial treatment the most up-to-date methods of rehabilitation—including massage and physiotherapy, exercises, games and recreations, light workshop and other handicrafts, and other forms of occupational therapy. This organisation works mainly through 21 special orthopædic centres and 36 special fracture departments apart from special centres for other types of injury and arrangements at numerous hospitals and clinics between ship and wharf One long-distance railway system on which I travelled in days gone by had as its slogan "Travel by rail and relax" I think it was a good slogan I always do relax on a railway journey I do not read newspapers or magazines I do not try to work, though unmarked examination papers may bulge my suit-case I do not read correspondence or try to figure out costs or estimate quantities in contracts as is I fancy the occupation of many of my fellow travellers in the restaurant car on my present journeys I relax I look out of the windows at the countryside through which we pass When I am tired of that or when lunch and its accessories have induced somnolence I sleep This habit of looking out of the window has made me very familiar with the sequence of canal, hedgerow, pasture, farms and towns that punctuate the route I know that when I see a certain clump of well-grown elms at the end of a derelict, weed-grown pasture, we shall cross a bridge over a sluggish, meandering river and then come upon a cluster of red brick cottages and a sheet of water from which some ramshackle apparatus appears to dredge something that someone seems to need The name of the place I do not know I cannot learn it from the station through which we next pass It might be Hovis or it might be Gentlemen, but I fancy it is neither of these, since, in these times of war, such names are probably only employed to deceive the possible invader I know when I see the first signs of chalk rubble in the cuttings through which we pass how far we are from London, what is the name of the next station and when we shall come into view of the magnificent beeches clustering the rise to the east of the railway

This journey that I make so frequently nowadays is one that I have resumed after an interval of rather more than thirty years Between 1909 and 1939 the whole sequence was forgot in absence From my window today I see great changes I know it is possible that not only *the green lane of my love* has changed but that change may have been in me and possibly I have looked at the scene with different eyes after so long an interval But this is not the whole of the story Change, vast change, there has been in the English countryside as seen on this journey Change, sad change, there has been, and this change is more apparent to one who has not watched its progress than to those who have lived through it It must be within the experience of every medical man that he may not notice the decline in health of someone with whom he is in daily contact—a member of his family maybe—whereas the change will appear striking to an outsider who has not witnessed the slow processes of decline It is this outsider's privilege I would claim in making observations from a railway carriage window over a limited area of the English countryside

To deal first with what is nearest at hand—the cuttings and embankments of the railway track These floral reserves have ever been a delight to me But now beyond the glory of the primroses and cowslips, the bluebells, scabious, snapdragon and campions, there is the ever-present sign of the rabbit—millions of rabbits It is a strange thing that there are intelligent people in England who fancy that Australia is on the verge of ruin owing to the rabbit pest, and imagine that England holds only enough rabbits to satisfy the just demands of "sport" On my railway journey there are now more evidences of the ravages of rabbits than could be seen in any comparable journey through the agriculturally developed areas anywhere in Australia I travel, as a rule by the most convenient day-time train so as to have the full of the day in which to see the country Even from this train I see rabbits by the hundreds disporting themselves in the shade at high noon By the afternoon train, when dusk is falling, I may see as many rabbits within a hundred yards of the rail as I would see in a long motor trip through the agricultural areas of three Australian states I do not know if there are any reliable statistics to show what damage rabbits inflict every year on the food crops of England I have seen it stated in print that it is in the neighbourhood of £70 million How it comes about that this vast increase in the rabbit population of our countryside appears to pass unnoticed is something beyond my comprehension It is doubtless because English people have never known what a real rabbit plague is capable of effecting Maybe there will one day come in England that combinatio of season and of food-supply that, in some subtle way, permits these things that will give them this salutar experience All other contributory factors and predisposing forces are at hand, only that subtile something that turns abundance and high fertility in norm times into plague proportions is lacking Judging by the experience of other lands, it may come at any time Meanwhile it is strange to read in local country paper that the land-owning bench of magistrates has sentenced some labouring man for the snaring of a "coney" This man is fined or sent to prison for his offence but we must remember that he is the same person, performing the same office, as the rewarded vermin exterminator of more enlightened lands Rabbits, their possibilities as a plague threat to our vegetable food-supplies their possibilities as a source of meat-supplies, their control and the responsibilities of land-owners who preserve them for "sport" towards agriculturists to whom they are a pest, seem to be in more need of legislative control than is at present apparent to one who regards England from the windows of a railway train

* * *

Two sorts of scientists speak from public platform those who think they have something to say and those who think they have to say something The former represent the prophets of old, prefacing their message with a "Hearken-unto-me-ye-people", the publici like American commercial broadcasters think they will be heard for their much talking These types were about evenly represented at the conference on Science and the War Effort, organised by the Association of Scientin Workers in Caxton Hall last Saturday and Sunday The newspapers, badly coached, described them as "The Back-Room Boys," although the object of the conference was to place Science, like Uriah, in the forefront of the battle And who could keep Prof Jack Haldane in a back room, or describe Sir Daniel Hall as a boy? Indeed, at tea I found myself surrounded by venerable men on one side, Mr H G Wells was still a little petulant about that speech to the British Association which he was unable to deliver in full, on the other side, Profes Bigwood M.D, of Brussels, who had been asked be hand to say something on the food situation in Bel made no complaints about the bad organisation whereby there was not time for him to speak And opposite me Dr Walter Elliot was telling us that education should stop between the ages of 14 and 18, I dared not a such a distinguished medical ex-minister how we were to fit the bulky medical curriculum into the few years he would allow us, or how his long vacation would be occupied

The main session on the first day was concerned with Food and Agriculture Sir John Orr, recently back from his tour of America, spoke of the recent advances in the science of nutrition and their impact on agricultural and economic policy He has said it many times before, but never with such mastery, and it cannot be said too often He has for long been a voice crying in the wilderness and he urged scientists to leave their back room and join him in liquidating the scandal of malnutrition A food policy based on human needs could be made the spear-head for economic prosperity based on the solid foundation of the promotion of human welfare This general theme was amplified by Dr H M Sinclair of Oxford who summarised the recent evidence of the extent and effects of malnutrition including the recent work in Canada which has shown that by proper feeding the infantile and maternal mortality-rates can be enormously reduced He advocated supplying people a a temporary measure with a supplement containing the known vitamins in suitable amount the best excipien probably being a biscuit But a professor of patholog criticised this idea, because natural vitamins were tasty whereas synthetic vitamins (or those extracted from pin needles or yeast) were nasty

The first day was somewhat marred by the search lights and cinecameras of the Ministry of Information But the second day had but one high-light a brillia summing-up of the conference by Prof J D Berna who assured us that the constructive suggestions an destructive criticisms produced at the conference would not be allowed to fall by the way side

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS M P

THE House met on Jan 8, the earlier date insisted on y the Commons as against the Government's proposal of longer recess and the occasion for the meeting was all o clear The grave position in the Far East is one hat demands the attention of Parliament no less than hat of the Government It is all the more necessary that arliament should have the opportunity of freely xpressing its views and its criticisms and demanding formation because the ordinary machinery of Opposi-on is in abeyance Criticism the Government got but nformation the Government did not give, at least not n the quantity the House desired As the *Times* omewhat acidly remarked, Mr Attlee's statement, iven in the absence of the Prime Minister, "could hardly ave been more economical of information" Many members evidently did not expect much information or although the House was very full at question time it as, for a major Government statement, relatively thin when Mr Attlee was speaking

The speech was a political rearguard action, fought by he Government against expected criticism and awaiting he reinforcement of the Prime Minister on his return rom conferences in Canada and the U S A Mr Attlee aid, "It is difficult to appreciate just what the scale of he war is in the Far East," but the possibility of "a udden attack by Japan has been present in the minds of the Government since we took office" In eferring to the question of an imperial war cabinet and a upreme war council, Mr Attlee said it would be a mistake to assume that the 1917 organisation would necessarily suit the conditions of this war The speech, n fact, did not contribute much to the discussion, and in particular it did not deal with India which is threatened by attack from Japanese forces

* * *

The position of India, and especially its political position, had figured prominently at question time, but Mr Amery gave very little encouragement to those hoping for a solution of the political deadlock In answer to Mr Graham White, Mr Amery said that he ould not discover in the resolutions passed by leading political parties "any satisfactory response to the Viceroy's recent appeal for unity" Major Milner asked whether the Secretary of State would not take some active steps himself, and Dr Haden Guest drew attention to the appeal addressed to the Prime Minister by Mr. Srinivasa Sastri, Sir Tej Bahadur Sapru and Mr Mukund Jayakar (members of H M Privy Council) and other Indian moderates who had created "a new centre and rallying point in Indian opinion" (an appeal backed up by the *Times*), but Mr Amery merely replied that it would receive "every consideration" It was clearly in the minds of members that an India cooperating in the war effort would be an asset to our strength, material and moral, comparable with the U S A India is now a great manufacturing area for certain munitions, but should have been by this time much more developed, and the problem of Indian government should have been resolutely tackled The British Government's attitude to India—to which dominion status has been promised in any event—is causing grave concern in the U S A

* * *

The statement of Mr Curtin, prime minister of Australia, which was a downright criticism of the British Government, was warmly approved in private by many members—probably a majority in the House—and was explicitly approved by several speeches in the debate To the creation of a general war council essentially consultative as distinguished from an essentially executive empire war cabinet we shall come, and on this council India should be represented on a footing of equality with the Dominions There should be in addition meetings of the representatives of the whole of the United Nations to discuss matters of immediate and of post-war concern

It is clear that the Government cannot postpone [illegible] a fuller statement of "peace aims" than those contained in the Atlantic Charter and those that emerged from the sitting of the Allied Council at St James's Palace, when Mr Maisky declared the adherence of Russia to this pact Details must be left for the future, but one matter is due for careful and public discussion now—namely, the method by which armed force will be controlled after a peace settlement The arrangement must be one under some form of international control, and the armed forces of individual nations under their own control must be severely limited to those required for police purposes Unless this international control is brought about—and it is one bristling with difficulties—there is no prospect of the world escaping from the threat of another great war

QUESTION TIME

Bread

SIR ERNEST GRAHAM LITTLE asked the Parliamentary Secretary to the Ministry of Food whether any firms, other than Roche Products, Ltd, had been approached to supply synthetic vitamin B_1, for the Government fortified loaf, and to what extent this monopoly of manufacture, continuously enjoyed by a single firm, restricted the supply of the fortified loaf which, 18 months after its general provision was promised, remained available for less than 25% of the population —Major G LLOYD GEORGE replied that two new factories had been acquired, equipped and financed by the Ministry for the manufacture of aneurin for fortifying white flour Arrangements were proceeding as rapidly as present conditions permit for the production of synthetic vitamin B_1 at these two factories, but it is not expected that they will be in production for 18 months In the meantime supplies are being received from the United States as well as from the company which is manufacturing in this country The scheme for the fortification of white flour with vitamin B_1 will be extended to the north west area next week and the result of this extension will be that approximately 50% of white flour consumed in the United Kingdom will be fortified

SIR E GRAHAM LITTLE What penalties are provided for breach of the instructions issued by the Ministry for the manufacture of the national wheatmeal loaf, what machinery exists for the exposure of such offences comparable with that which deals with adulteration of food, and have any prosecutions been instituted?—Major LLOYD GEORGE The instructions for the manufacture of the national wheatmeal loaf are contained in the Bread (Control and Maximum Prices) Order 1941, S R & O 1542 An infringement of this order would be an offence against the Defence General Regulations and, as such, punishable by imprisonment or fine or both The enforcement of this and other orders made by my department is undertaken by the Ministry itself through its divisional and local organisation —SIR E GRAHAM-LITTLE How many prosecutions have been instituted by the department in respect of breach of its orders or instructions regulating the composition of bread sold under the designation of national wheatmeal, and what was the date, place and result of such prosecutions?—Major LLOYD GEORGE Up to the end of November, which is the latest date for which figures are available, there have been no such prosecutions

Mr W LEACH Is Major Lloyd George aware that bread, cakes and puddings, made of the white flour now being issued to bakers and the public, can only be kept for a very few days, and can he explain why some of the bread made with this flour has turned green when kept for a few days?—Major LLOYD GEORGE No information of the circumstances mentioned has reached the Ministry I shall be pleased to investigate any incident of the kind.

Rehabilitation of the Injured

Replying to Mr HENRY STRAUSS, Mr E BROWN said It is one of the first considerations of the Emergency Hospital Scheme to ensure that the injured person is as fully restored to normal function as his injury allows, before discharge from hospital To that end the scheme includes a widespread organisation of special treatment centres for fracture and orthopædic cases, providing as part of remedial treatment the most up to date methods of rehabilitation—including massage and physiotherapy, exercises, games and recreations, light workshop and other handicrafts, and other forms of occupational therapy This organisation works mainly through 21 special orthopædic centres and 56 special fracture departments, apart from special centres for other types of injury and arrangements at numerous hospitals and clinics for short stay cases and outpatient treatment It has as its purpose general rehabilitation up to the point at which the patient is ready to resume his normal life or to undergo vocational training or any other special preparation for employment that may be necessary To ensure a proper link between the latter type of training or preparation and hospital treatment, it has been arranged for a local officer of the Ministry of Labour to interview the patient while he is still in hospital and to advise, in consultation with his medical attendant, on the course best suited to his case after discharge from hospital —Sir **Francis Fremantle** Does the rehabilitation include cases of speech therapy ?—Mr **Brown** I would like special notice of that question, but I think it does

Vital Statistics

Replying to Sir F **Fremantle** Mr **Brown** said In the years 1939 and 1940 respectively, the birth rates per 1000 of the population were 14 9 and 14 6 , the death rates were 12 1 and 14 0 Maternal mortality was 2 82 and 2 61 per 1000 total live births, infant mortality was 50 and 56 per 1000 births For 1940 the birth rates and death rates (with the exception of infant and maternal mortality) have been calculated on an estimated population which excludes non civilians The above information will be expanded in the summarised report on the work of my department which I hope to publish shortly Later Mr Brown said he hoped the report would be in the printer's hands within the next fortnight

Tuberculosis Deaths in Mental Hospitals

In reply to a question Mr **Brown** circulated the following table in the Official Report

Year	Deaths from tuberculosis (all forms)					
	Number of deaths			Rate per 1000 patients resident		
	Males	Females	Total	Males	Females	Total
1938	290	210	500	1 9	2 9	3 8
1939	316	225	541	5 3	3 0	4 0
1940	439	312	751	7 5	4 2	5 6

Medical Women and Ministry of Labour Staff

Miss I **Ward** asked the Minister of Labour whether, in view of the wide use of woman power in the war effort, and the desirability of obtaining the cooperation of women in all spheres of departmental work, consideration would be given to the desirability of appointing a medical woman to the Ministry of Labour staff —Mr **Ernest Bevin** replied The medical inspectorate of factories attached to this Ministry already includes women and further appointments of medical women to the Ministry will be made if necessary —Miss **Ward** Will the Minister consider the appointment of medical women to advise, along with the medical department, in relation to the recruitment and medical examination of women in connexion with conscription and registration ?—Mr **Bevin** The medical services that we have at our disposal—the medical boards, the Ministry of Health and other branches of medical service now available—are, I think, adequate —Miss **Ward** Is the Minister aware that the Medical Women's Federation would like a woman's representative upon the staff of the Ministry of Labour ? Would he sometimes give consideration to the desires of women ?

Care of Young Children

The **Minister of Health** informed Major B A **Peto** that the President of the Board of Education and he had already appointed an executive committee of officers of the two departments under the chairmanship of Sir Wilson Jameson Consultation with the Ministries of Labour and of Supply has been maintained by regular meetings A contact circle between officers of the Ministry and the Board and women experienced in the problems of child care was established at the outset of this work and regular meetings have been held —Miss **Cazalet** Is the Minister satisfied with the speed in this matter ? Mr **Brown** I am never satisfied

Return of Evacuees to London

The number of school children in the administrative county of London increased by 1330 during the week ended Dec 6, by 1658 (Dec 13), by 668 (Dec 20), by 668 (Dec 27) While the inward movement is continuing, there was a drop in the rate of return over Christmas (Mr **Brown** replying to Capta L F **Plugge**)

Broadcasts on Health

Mr A **Edwards** asked the Minister of Information why th British Broadcasting Corporation had refused to allow th expression of views opposed to vaccination and inoculation, and whether they had considered the right of the parents wh objected to these operations to have their arguments again given the same publicity as was given to the statement in favour of them ?—Mr B **Bracken** replied I have consulted the governors of the BBC and I understand from them that in their broadcasts on health subjects they hav felt bound to give such advice as is generally considered to b correct by the main body of medical opinion

Upgraded First-aid Points

Replying to a question, Mr **Brown** said The number of first aid points which have been upgraded—i e , provided with better accommodation and additional equipment and personnel is 518, and it is estimated that another 750 will be similarly treated as the result of the reviews which the local authorities are undertaking

Dairy Herds

In answer to a question, Mr R S **Hudson**, Minister of Agriculture, said that there had been no decrease of the number of dairy cattle and calves as a result of the ploughing up policy Steps were being taken to show that by arable dairy farming the dairy herds of the country would actually be increased He was glad to say that the marketing of calves was well below that of the corresponding period of l year

Infectious Disease in England and Wales

WEEK ENDED JAN 3

Notifications —The following cases of infectious disease were notified during the week smallpox, 0 , scarlet fever, 1126 , whooping-cough, 1513 , diphtheria, 1045 paratyphoid, 15 , typhoid, 5 , measles (excluding rubella), 926 , pneumonia (primary or influenzal), 962 , puerperal pyrexia, 186 , cerebrospinal fever, 131 poliomyelitis, 7 , polio-encephalitis, 2 , encephalitis lethargica, 4 , dysentery, 106 , ophthalmia neonatorum, 76 No case of cholera, plague or typhus fever was notified during the week

Deaths —In 126 great towns there were no deaths from measles or scarlet fever, 1 (0) from an enteric fever, 8 (0) from whooping-cough, 43 (2) from diphtheria 61 (8) from diarrhœa and enteritis under 2 years, and 37 (2) from influenza The figures in parentheses are those for London itself

Liverpool reported the fatal case of enteric fever There were 4 deaths from diphtheria at Liverpool and 3 each at Newcastle-on Tyne and Birmingham

The number of stillbirths notified during the week was 211 (corresponding to a rate of 37 per thousand total births), including 19 in London

---

Royal Faculty of Physicians and Surgeons of Glasgow —At a meeting of the faculty held on Jan 5, with Mr Roy Young, the president, in the chair, Dr I S McGregor (Glasgow) was admitted to the fellowship

Edinburgh Public Medical Service —According to the rules the extension of National Health Insurance to non manual workers whose incomes do not exceed £420 would automatically make these people eligible for this service but at a recent members' meeting it was resolved to limit the service to those whose incomes were under £260 a year or £5 a week The increased costs of practice have made it necessary to increase the remuneration of the doctors in the service Rather than adopt the BMA suggestion of a 20% increase in attendance fees the members felt it would meet the case if from the beginning of April they were to cease to supply medicines to subscribers Dr Joseph Stark has been appointed chairman of the service Dr J R Hope secretary , and Dr Norman Stewart [illegible]surer

Letters to the Editor

EMOTION AND BLOOD-PRESSURE

SIR,—Dr H O Butler's letter (*Lancet*, Jan 3, p 26) npts me to relate the best Aberdonian story I know, d unlike most of them it happens to be true

A few years ago I had as a patient a business man from ierdeen suffering from the effects of a cerebral hæmorrhage though the resulting hemiplegia was very mild, he was an citable old gentleman with a blood pressure round about 0/130, and I therefore insisted on total cessation of all siness activities and complete rest in bed under nursing pervision This so agitated him that for a time it looked though the remedy would merely aggravate the disease, itil he fortunately discovered that one of his insurance ilicies contained a sickness clause entitling him to ten guineas week for a maximum of 52 weeks, so long as he was com etely disabled I had no hesitation in so certifying him, id after a period in bed his paresis cleared up, his blood-essure came down to a steady 175/100, and I allowed him up r a time each day provided he kept clear of business affairs At this point the insurance society intervened, insisting iat as he was no longer confined to bed he must not be re irded as being completely disabled and entitled to full ckness benefit, and demanding that he be seen by one of their vn physicians In due course I met the insurance society hysician, gave him my full notes of the case, and left him ith my patient, as I had another consultation On my turn I was informed that the insurance doctor had left ı urgent letter to be given to me the moment I arrived ack It was to the effect that he had found my patient far orse than I had suggested, that his blood pressure had risen ɔ 250/150, and that he did not think he had more than three ionths to live I rushed round to find a very agitated old entleman, greatly perturbed at the prospect of his weekly enefit being reduced, but on hearing that nothing of the ort was contemplated he quickly subsided, and in a couple of ays his blood-pressure was back to 175/100

He *did not die* in three months, but continued to draw is ten guineas a week until I could safely allow him to esume some of his various directorates, and it was not intil three or four years later that a second hæmorrhage emoved him peacefully to a realm where insurance loctors cease from troubling and emotional disturbances re at rest

Wimpole Street, W 1 **HAROLD BALME**

SIR,—Dr Butler is correct in his contention that motion influences the diastolic pressure as well as the ystolic From September, 1939, to January 1940, I was hairman of the medical board working with an officer eception unit Several young and otherwise healthy andidates were found at the board to show raised ystolic and diastolic pressures Before rejecting these andidates I used to make them come to my rooms on a later date, when I re-examined them at ease and without the possibly disturbing presence of a number of other candidates and a series of medical examiners In the majority of these young candidates the diastolic pressure as well as the systolic fell to normal limits I reported this observation at a meeting of the Assurance Medical Society in 1940

Bristol 8 **J A NIXON**

OPERATION FOR PILES

SIR,—During a somewhat ubiquitous surgical career I have seen a number of pile operations practised, all of which in good hands seem to give uniformly good results —not least of all the old-fashioned clamp and cautery I have, however, been most attracted to a little operation shown to me by Mr J H Rawlinson at the Northern Hospital, Liverpool The technique apparently originates from the Mayo Clinic and is really a modification of Whitehead's operation

The preoperative treatment is that used at St Mark's Hospital, but the pubis is not shaved Spinal stovaine, 0 3 c cm, is given, and with the patient in the lithotomy position the anal sphincter is slowly and gently stretched An incision starting in front and to one side of the midline follows the pectinate line to a similar point on the same side behind A semicircular cuff of pile bearing mucous membrane is then dissected up No encroachment must be made on anal skin The side with the largest piles is started first and each half completed separately The operation is greatly facilitated by the use of Lahé's tiny swabs gripped in the beak of a hæmostat, at the same time a right degree of tension being maintained by mosquito forceps on the edge of the fragile membrane Once the right plane has been entered this dissection proceeds easily The external hæmorrhoids, if present, are dissected out from the skin flap A small, round bodied, fully curved needle, charged with no 1 catgut, now begins a running suture which is first tied at the anterior end of the incision, by a process of cutting a little and sewing a little the pile bearing area is removed and the mucous membrane is approximated to the anal skin The stitches through the skin edge should be spaced more widely than those in the mucous membrane, so that an even apposition of the edges is achieved If the needle is made to pass in and out of the inner surface of the membrane, at its edge, a slight shelving effect is obtained, with advantage A small quantity of soft paraffin is inserted into the rectum, but no tube Postoperative treatment is by hot boracic compresses A warm olive oil enema is given on the third day, preceded by liquid paraffin, ½ oz, on the previous evening, a similar dose of paraffin is given twice daily for the remainder of the convalescence A hot sitz bath is taken twice daily from the third day, and the patient is out of hospital on the seventh day

The operation has several advantages Secondary and external piles can be dealt with comprehensively Postoperative pain is minimal, often absent, this contrasts strongly with the excruciating pain, requiring much morphia, which often follows the ligation type of operation The incidence of postoperative retention of urine in the male shows a similar reduction On digital examination, the anal canal seems to return to normal more rapidly than after other pile operations The average period of hospitalisation is reduced, and the results compare favourably with those of other methods

Romford, Essex **D LANG STEVENSON**

POSTURE DURING SLEEP

SIR,—May your correspondents upon this subject, so far as it affects the healthy person, be referred to the careful work of Johnson, Swan and Weigand (*J Amer med Ass* 1930, 94, 2058) who, using mechanical and photographic methods upon an adequate number of cases, upset the notion that healthy sleep is taken in a few positions each held for a long time, and found that, to quote a typical example, changes in gross bodily position, many being mirror images of others, occurred between 20 and 45 times during a night of 8 hours ?

Cambridge **F B PARSONS**

PERCY FLEMMING

SIR,—The death of Percy Flemming removes from the familiar U C H figures one who never failed to champion the cause of the women students Perhaps they were among the "lame dogs" mentioned in J H P 's obituary notice of Jan 3 But Flemming never acted from sentimental motives Through his wife, who was senior physician at the Elizabeth Garrett Anderson Hospital, he came to know very fully the possibilities of a professional life which never left out of account the claims of family life, so that he would not listen to those who tried to make out that no woman could succeed professionally unless she were divided against herself and had forfeited her legitimate spheres of interest He was a tower of strength to those women who found themselves somewhat precariously and unpopularly installed at U C H in the difficult years immediately after the last war He was a stickler for professional etiquette, and realised how little chance the women had then of knowing the traditions of a great teaching hospital His professional advice to them was shrewd and was given unstintingly He enjoyed teaching, and had a way of imparting his facts which made the student feel capable of reproducing them He never gave brilliant demonstrations, but his diffident and halting way of putting his questions, and his insistence on the prick of intellectual curiosity being used to spur on further inquiry, would succeed in giving to students, who might have no particular interest in his specialty, a wide and sound foundation of knowledge Observation, clinical judgment, and an unusually fine sense of the personality of his patient would always come first, and theory only in sufficient amount to remind the student of the rules To make a success of Percy Flemming's clinic, it was not necessary to know a lot, but one had to notice everything and think hard, and the knowledge seemed to fit into place with that

Nowhere was his gift of making a subject interesting seen to better advantage than in his long talks on hobbies He was no athlete but a great walker and on foot he explored a good deal of this country, reconstructing as he did so the rich life of monastic England, or of the Romans His speculations were never undirected or romantic, but were related always to his bold and critical scrutiny of all his observations A walk beside the Thames, near his home, would lead to a discussion of the formation of the chalky Chilterns, and an afternoon with the grandchildren would mean a series of shrewd questions as to how children learn to notice shapes, and why some children are apparently word-blind

E M C

ANÆSTHETIC FLOWMETERS

SIR,—I feel it necessary to dissociate the Rotameter Company from Dr Magill's statement "the fact remains recorded in the correspondence files of the Rotameter Company that Mr King first suggested the manufacture of rotameters for anæsthetic purposes in 1932" We have on file one letter from Mr King in 1932 which states "Please let us have particulars of 'Rotameters' for gas and oxygen, and oblige" We have no record of any further communication from Mr King until June 1937, when we discussed with him the adaptation of rotameters to modern anæsthetic requirements I may add that early in 1937 we received a visit from Mr Richard Salt, technician to the Nuffield Department of Anæsthetics, and I accept the statement (*Lancet*, Dec 6, 1941, p 718) that the adaptation of rotameters in a form suitable for anæsthetic apparatus was suggested by Mr Salt

A H TROST,
Director,
Rotameter Manufacturing Co Ltd

Portslade, Sussex

NEUROSIS SIMULATING ORGANIC DISORDER

SIR,—The paper by Dr Cook and Dr Sargant is surely something of a landmark in medicine For about forty years isolated voices have been crying in the wilderness of the medical journals (one of them, for example, in the *Lancet* of Feb 24, 1940) that if the old formula "exclude organic disease before diagnosing neurosis" were amended to read "exclude neurosis (if you can) before diagnosing organic disease," it would go some way towards preventing the commonest error in medicine Is it not permissible for us to see in this paper, and in its publication in your columns, the first faint signs of the general acceptance of this obvious and elementary truth? If so, we may indeed regard it as a herald of the dawn

The writers might do still further service if they would—or could—explain what they mean by "neuro-psychiatric opinion" Is "neuropsychiatry" a specialty which can be practised by one individual, or are two required? If the latter, what are they called? If the former, does the "neuropsychiatrist" claim expert knowledge of the two great branches of medicine indicated in his horrible name? Much should, indeed, be required of him if he does I rather suspect that I met one or two of him at an earlier stage of the war Truth compels me to state, however, that in spite of his claims, or possibly because of them, he, like the House of Peers throughout another war, "did nothing in particular, and did it very well"

HENRY YELLOWLEES,
Late Consulting Psychiatrist
to the B E F in France

Harley Street, W 1

MEDICO-LEGAL SOCIETY—An ordinary meeting of this society will be held at 26, Portland Place, London, W 1 on Thursday, Jan 22, at 4 30 P M, when Mr Julius Grant, F I C, will speak on paper as evidence

BRITISH INSTITUTE OF PHILOSOPHY—On Friday, Jan 23, at 3 P M at 14, Gordon Square London, W C 1 Prof A D Ritchie will deliver a lecturer to the institute He will speak on the social relations of science

Obituary

ALFRED LEONARD FULLER

F R C S I

Mr A Leonard Fuller died on Christmas eve at the age of 71 in Bath which had been the pleasant setting of almost his whole life He was born and bred in the town, and soon after qualifying from St Thomas' Hospital in 1895 he returned to settle there for good as partner to the late Dr Tregenna Goss, whose elder daughter, Ethel Margaret, he married in 1897 His association with the Royal United Hospital was long and fruitful —he was appointed anæsthetist as early as 1901—and with it grew his reputation as a surgeon He was appointed assistant surgeon in 1904, took his Irish fellowship four years later, and when he retired from the staff in 1930 he had been senior surgeon for five years He was also surgeon to the Royal Mineral Water Hospital Fuller served for many years on the committee of management of the Royal United, he took a great interest in the founding of its paying block, an when it was opened in 1924 under the name of the Forb Fraser Hospital he performed the first operation there

In 1940 when the Bath Book Society celebrated it centenary Mr Fuller sent us an account of its work, an last year on Dec 12 when it met once more, as usual a his home, he was again elected to the secretaryship a office which he had worthily held for 37 years He wa also a past president of the Bath Clinical Society prominent freemason, since 1939 he had been provincia grand mark master for Somerset When the B M A me at Bath in 1925, as citizen and surgeon Mr Fuller was th obvious choice as secretary of the surgical section H was also one of the editors of the "Book of Bath" whic was published to commemorate the meeting, and som of its attractive illustrations were reproduced from print and pictures in his collection In his leisure Mr Fulle was an enthusiastic gardener He was generous wit his knowledge and skill, and the gardens at the Roya United owe much to his interest and counsel His wi died in 1927, and he leaves a daughter and two sons on of whom is Mr Herbert Fuller, F R C S E

G E CARTWRIGHT WOOD

M D, B SC EDIN, M R C S

Dr George Edward Cartwright Wood, who died o Christmas Day at Bexhill-on-Sea, was for 20 yea director of the laboratories of the Metropolitan Asylum Board at Sutton, retiring owing to ill health in 192 He graduated in medicine at Edinburgh in 1885, an then finding his interests were physical and physiologic rather than clinical went on to take the B Sc in publ health For the next few years he worked on enzym at Edinburgh, on saprophytes at Berlin with Hueppe and on anthrax at the Pasteur Institute in Paris Whe the Metropolitan Asylums Board started special labor tories and stables for the bacteriological examination specimens and the production of antitoxic sera for it fever hospitals, he became Sims Woodhead's assistan and when Woodhead left in 1905 to take the chair pathology at Cambridge, Wood succeeded him as dire tor His great bacteriological knowledge and his spec experience of bacterial filtration, on which he wrote important treatise, fitted him specially for this wor In 1908 excellent new laboratories and stables we erected at Sutton, mainly according to his plans an specifications One of his assistants, who later becam professor of hygiene at Breslau, gratefully recalls the yea he spent with Cartwright Wood Wood was, he writes, master of technique, a good teacher, the kindest and mo generous chief, and above all considerate of the welfare every member of the staff After his retirement h used to spend half the year in his London rooms amid h books, the other half with his sister [illegible] ved [illegible]

FELLOWSHIP FOR SIR EARLE PAGE

THE admission of Sir Earle Page, special representa- ve of the Australian Government, to the honorary llowship of the Royal College of Surgeons of England ok place on Jan 8 in room 1 of the college museum, e first occasion on which this room has been used since rearrangement as a lecture and assembly room In address Sir Alfred Webb-Johnson, the president, said t the council had decided to confer the honorary owship partly because of Sir Earle Page's services to gery and partly because of the honour he has brought our profession by his distinguished services as a esman

From the time of Aristotle to the present day," he said, e hazardous path of politics has attracted many members the medical profession Several of them have achieved inction, as one might expect from their training, for, as nd treatment can only be planned after correct diagnosis, an sound policy only be formulated in the light of a know ge of facts In the history of the British Empire we may proud of the record of many members of our profession o have followed a political career William Petty founded science of political economy Walter Foster, Christopher dison (a fellow of our college), Auckland Geddes and lter Elliot have held high ministerial office at home, arles Tupper was prime minister of Canada and Starr neson of South Africa, while Godfrey Huggins (another ow of our college) is prime minister of Southern Rhodesia other countries the record is not quite so good In France, example, that sturdy patriot Clemenceau, who today again ght have 'fired the soul of France and steeled her will,' s a medical man, but so was Marat and so was the advocate the humane killer, Dr Guillotin You have left active actice for some years but your colleagues have not forgotten ur services to surgery and have watched your political reer with interest and pride We recall that in the last r you gave splendid service in a busy casualty clearing ation on the Western Front In this war you are one of a am charged with the extirpation of the most dreadful ourge that has ever beset mankind, and for that scourge ll be needed the most radical excisional operation ever per rmed For such a task it is but fitting that you should be med with what is regarded as the highest surgical diploma tainable "

Sir Earle Page said he deeply appreciated the honour onferred on him Though he had had a varied life, at eart he was only a truant surgeon, and the most interest- g and happy period of his life was on the French front the casualty clearing station, with constant oppor- unities of meeting and working in full collaboration with he British and Empire surgeons " Surgical training is ost valuable for political life The most needed and ast common thing in politics is diagnosis before treat- ent Too often political treatment is empirical A uge poultice is clapped on the cancer to hide it from the ublic, instead of doing a complete excision The next ost important thing needed in politics which our life nd training teaches is quick decision and immediate ction on the decision With this combination of early agnosis, quick decision and immediate action, half the olitical and international troubles would never arise

My job during the last three months has been peculiarly ssociated with my professional training It was first o impress on the British Government the anatomical oint that the Empire has a heart and body as well as a ead, and that the whole organism would be just as dead f shot through the heart as through the head Four- ifths of the Empire possessions are in the Indian and acific Oceans, six-sevenths of its population and two- hirds of its resources, and Australia is an integral and nost important part of the body whose views it has been ny duty to put forward My second job has been a ivisectional research on the Empire system of govern- nent while it is actually functioning on its various planes, o see where it fails and how it can be improved In this, have followed true Hunterian principles and I find that he critical point of precipitation of policy was not always igh realms but usually three or four men down the cale My surgical research on this political problem of Empire coordination of policy which must be solved efore we can have a satisfactory Allied coordination of policy may perhaps entitle me to the distinguished honour you confer on me today But whether so or no, I thank you for what I shall always prize, not only for its intrinsic merit, but as a mark of your esteem and appreciation of my life work "

EMBRYO AS PATIENT

THE proper study of mankind is man, but for our knowledge of very early man we are largely dependent on study of the lower animals Diseases of the human embryo cannot be treated surgically and though the embryo can be affected by drugs controlled treatment is impossible Some of these aspects of intra-uterine life were discussed by Prof A St George Huggett at a meeting of the Pharmaceutical Society in London on Jan 8 Claude Bernard first demonstrated that the placenta has storage functions analogous to the liver and it is now known to exercise other important functions in the transmission of foodstuffs, waste products and gases between maternal and fœtal tissues Endocrines of the sterone type and from the pituitary appear to be stored there, they may, however, be secretions or possibly katabolites of placental tissue During the last third of pregnancy the six layers of tissue which separate fœtal and maternal circulation atrophy to one, two or three layers, but the persisting tissue always includes the fœtal vascular endothelium so that the blood circulates in sacs suspended in the maternal blood and conditions are thus suitable for diffusion and also for the diapedesis of organisms Before this critical age the placental storage of glycogen and fat was maximal, later carbohydrate, fat and iron appear in the fœtus but little is known of the mechanism by which they cross the placenta After the critical age the placental stores decrease and simple diffusion occurs, together with the passage of unaltered colloids and organisms Inorganic salts traverse the placenta by diffusion in all animals, strychnine and most diffusible alkaloids likewise cross with ease and can kill the fœtus The problem is largely one of molecular size versus placental thickness The cow, sheep and goat lose one maternal layer and allow potassium iodide to cross but stop thyroxin, œstrone and antitoxins The dog and cat lose a further maternal layer and permit the passage of the endocrines but stop all antitoxins and proteins The rodent and man lose still one more maternal layer and allow most antitoxins and colloids to pass but stop the toxins of diphtheria and tetanus as well as the big molecules of globulins Organisms have never been recovered from the human fœtus before degenerative changes have occurred in the placenta Virus and other infections causing skin rashes occurring in pregnant women during the last part of pregnancy result in fœtal rashes The fœtus seems to have no power of forming antitoxin on its own, this being entirely a postnatal development Complaints found in the fœtus include cholera, pneumonia, bubonic plague, erysipelas, anthrax, tuberculosis, scarlet fever measles and variola The fœtus has been infected with smallpox while the mother was unharmed In common with adults the fœtus is unable to synthesise the benzene ring and is therefore entirely dependent on the mother for amino-acids and vitamins The permeability of the placenta to drugs is fairly high in the human, a bromine rash has been observed Narcotics can percolate the placenta,—as in twilight sleep, water-soluble narcotics pass more readily than the fat-soluble water-insoluble anæsthetics, like chloroform, though a large dose will take effect Concomitant with the altered permeability there is a pronounced increase in the fœtal weight and deposition of mineral substances The chief factors which affect weight include heredity, maternal nutrition and mineral supply, the endocrines, competition in multiple pregnancies, and maternal disease At present the maternal food-supply is the only one of these which can be controlled If the maternal diet is sufficiently low the fœtus suffers from malnutrition and the most fruitful months of growth are wasted. Malnourished infants can be brought to a normal weight only by intensive supplementary feeding over a period of at least four to five years The remedy is to provide the mother with a diet adequate both in quantity and quality

Medical News

Royal College of Surgeons of England

A meeting of the council of the college was held on Jan 8, with Sir Alfred Webb Johnson, the president, in the chair Mr Victor Bonney was appointed Hunterian orator for 1943, Mr L R Braithwaite Bradshaw lecturer for 1942, and Sir Hugh Lett Thomas Vicary lecturer for 1942 The Hallett prize was awarded to P G Somerville (Camb and St George's)

The council received with thanks a gift of £2000 from the American College of Surgeons for assistance in restoration necessitated by enemy action

A Diploma of membership was granted to Ronald Fothergill (Birm) and also to Charles William Graham, hon surgeon to the Carlisle Dispensary Mr, Graham passed the primary examination for the membership in 1885 and therefore ranks as a pre conjoint board student

The following diplomas were granted, jointly with the Royal College of Physicians —

D P M —D T Aitken, Gerald Caplan J H Colhoun, Margaret J Moore, L H Rubinstein, B B Sharp, Barbara J Shorting, G M Tucker, A J Warren and Duncan Whittaker

D L O —T M Banham, Leon Gillis and J S C Monro

Epsom College

The council of the college will shortly proceed to award St Anne's scholarships to girls attending Church of England schools Candidates must be fully 9 and under 16 years of age, and must be orphan daughters of medical men who have been in independent practice in England or Wales for not less than 5 years The value of each scholarship is dependent upon the means of the applicant and the locality and fees of the school selected

The conjoint committee of the college will in May award a Christie pension of £89 a year to a necessitous medical man, fully 55 years of age who has been registered for 5 years, and who is in need of help

Forms of application for the scholarships and the pension can be had from the secretary's office, Epsom College, Surrey, and must be sent in by April 24

Royal Society of Medicine

A general meeting of the fellows of this society will be held on Tuesday, Jan 20, at 3 30 P M The sections of pathology and of psychiatry will meet at 2 30 P M on the same day At the section of pathology Dr G M Findlay will speak on virus D, and Dr Dorothy Russell will report on a case of gargoylism At the section of psychiatry Major M J F McArdle and Dr W L Neustatter will discuss neurosis after head injury On Jan 22, at 2 30 P M, Mr G E Neligan will give his presidential address on some comparatively uncommon diseases to the section of urology On Jan 23, the section of disease in children will meet at 2 30 P M, when Mr D W C Northfield and Dr W G Wylie will open a discussion on intracranial injuries in childhood On the same day and at the same time Lieut -Colonel D Gordon Cheyne will read a paper to the section of epidemiology and state medicine on the medical aspects of man power in a world army today

Medical Awards

The *D S C* has been awarded to Surgeon Lieut Commander E M Tymms, M D Melb, R A N R, H M A S *Perth*, Surgeon Lieutenant R I Bence, B M Oxfd, R N V R, Surgeon Lieutenant E B McDowall, M B Camb, R N V R and Surgeon Lieutenant C F Harrington, R A N R, for outstanding gallantry, fortitude and resolution during the Battle of Crete

The *M B E* has been awarded to Dr Jack Seidenberg, medical officer at a first aid post in Stepney

During an air raid the post was damaged, but despite the difficult conditions, Dr Seidenberg continued to treat casualties While loading an ambulance with the more serious cases a bomb fell nearby, and the doctor was buried by debris He extricated himself and although almost blinded and in great pain, he went to the aid of an injured fireman He then continued to help other victims until he collapsed Dr Seidenberg showed great courage and devotion to duty

---

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export

Dr JAMES FENTON, medical officer of health for the Royal Borough of Kensington and a former president of the Society of Medical Officers of Health, has been elected president of the Medical Defence Union

Hospital Committee for Scotland

The Secretary of State for Scotland has appointed a committee to report to him on the application to Scotland of the Government's post-war hospital policy which wa announced in Parliament on Oct 9 (see *Lancet*, 1941, ii, 466) The chairman of the committee is Sir Hector Hetherington, principal of Glasgow University, and the other members are Mr D A Anderson, Mr James Cook, J P, Mr J M Erskine, D L, J P, Sir John Fraser, F R C S E, Mr Neil Gunn, Mr Charles Murdoch, Mr David Robertson, LL B, Miss Beatrice Rose, Mrs C McNab Shaw, and Mr J M Vallance, W S

The committee's remit is "To consider and make recommendations within a policy aimed at the post war development of a comprehensive and coordinated hospital service in Scotland on a regional basis as to the future administration of new hospitals buil by the Government and now administered by them as part of the Emergency Hospital Service, the arrangements most likely to secure the maximum cooperation between voluntary hospital local authority hospitals and the new hospitals referred, and the financial arrangements between voluntary hospitals and local authorities and between voluntary hospitals and patients and contributors best fitted to enable those hospitals to cooperate in th coordinated hospital service "

Mr G Price Jones and Mr R P Fraser, both of the Department of Health for Scotland, will act as secretary and assistant secretary, and communications for the committee should be addressed to the secretary at St Andrew's House, Edinburgh, 1

London Jewish Hospital Medical Society

Miss Muriel Landau will deliver her presidential addr to this society on Thursday, Jan 29, at B M A Hou, Tavistock Square, W C 1, at 3 P M She will speak on the history of gynæcology with some points of special Jewish interest

---

Appointments

ALLAN K B M B DURH an examining factory surgeon for th Daimler Company

KING C A, M R C S senior R S O at the Royal Gwent Hospital, Newport Mon

MAUTNER FRANCIS, M D PRAGUE asst M O H and asst school M O for Dudley

MCLINTOCK, J M L R C P E examining factory surgeon for Larbert Stirlingshire

URICH L G W, M R C S, D T M & H D P H M O H (Grade A for Trinidad

Births, Marriages and Deaths

BIRTHS

BAILEY —On Jan 9, at Ealing, the wife of Dr Robert Bailey—a son

CRITCHLEY —On Jan 9, at East Molesey, Surrey, to Dr Dorothy (*née* Pope) and Major Cyril Critchley R A M C —a son

EDWARDS —On Jan 3 at Swansea the wife of Surgeon Lieutenant C H Edwards R N V R —a daughter

JOHNS —On Dec 26 at King's College Hospital, London, the wife of Dr F A M Johns—a son

MACHRAY —On Jan 9, in London, the wife of Dr Robert Machray—a daughter

MARSHALL —On Jan 5, at Tonbridge, the wife of Dr John Mar of Hadlow, Kent—a son

PASMORE —On Jan 8 in London, to Dr Jean and Dr Steph Pasmore—a daughter

WARD —On Jan 6 at Ellon Aberdeenshire, the wife of Surge Lieutenant F G WARD R N V R —a son

WATSON —On Jan 8 at Glasgow, the wife of Captain G I Watson R A M C —a daughter

MARRIAGES

MARTIN—STEWART —On Dec 20, in London Kenneth Whitt Martin M B, surgeon lieutenant R N V R, to Daphne F Stewart

MILES—CLAYTON GREENE —On Jan 8 in London, Roger Miles M B to Doris Clayton Greene

PETERKIN—EDWARDS —On Jan 6, at Warminster Douglas Bro Peterkin M B Edin, captain R A M C of Inverness, t Truda Edwards

DEATHS

ADDISON —On Jan 8 at Bradfield Hall Bury St Edmund Oswald Lacy Addison M B Lond F R C S

MARTIN —On Nov 3 John Martin M R C S surgeon capta R N retd (Corrected notice)

STEELL —On Jan 10 in London Graham Steell M D Edi F R C P, aged 90

ORIGINAL ARTICLES

EXPERIMENTAL WOUNDS TREATED WITH COD-LIVER OIL

AND RELATED SUBSTANCES

LOTTE DANN, M D TURIN
ALFRED GLÜCKSMANN, M D HEIDELBERG
KATHARINE TANSLEY, SC D , PH D LOND

(*Strangeways Research Laboratory, Cambridge*)

SINCE Lohr (1934a b c and d) introduced cod-liver oil dressings into surgical practice many workers have recorded beneficial effects from their use (Bosse 1935, 1936, Kummel and Jensen 1936, Strauss 1935, Bruckner 1935, Lucke 1935 Horn and Sanders 1934, Krauter 1938, Steel 1935, Zacker and Spier 1938) Kirschner (1937) however obtained better clinical results with zinc ointment and in some cases found cod-liver oil dressings harmful Experiments have also been made on the effect of cod-liver oil and certain of its fractions on wounds and burns in animals Lohr and Unger (1937) found that in guineapigs cod-liver oil improved not only the treated wound but also a " control " wound made on the same animal Of the fractions tested squalene and the saturated fatty acids were ineffective but improvement was observed with the unsaturated fatty acids vitamins A and D, and the unsaponifiable fraction of the oil, though none of these beneficial fractions was quite as active as whole cod-liver oil

The effect of vitamin-A dressings seems to depend on the concentration of the vitamin and the form of application Thus Lauber and Rocholl (1934) found that vitamin A in cholesterol is beneficial in low and harmful in high concentrations, but if applied in paraffin or lanoline is harmful in any concentration Escarras and Paillas (1938), applying vitamin A in oily solution, obtained beneficial effects with small doses while large doses promoted collagen regeneration and vascularisation but delayed epithelialisation Heinsius (1936) found that vitamin A promoted epithelial regeneration in experimental lesions of the rabbit cornea, while Rotth (1940) obtained beneficial results only in vitamin-A deficient animals

There is no convincing evidence that vitamin D improves healing Lauber (1933, 1934, 1935), whose results confirmed those of Saitta (1930), found small doses ineffective and large doses inhibitory

The beneficial effect of cod-liver oil has been attributed to the unsaturated fatty acids and the peroxides, which according to Lohr and Unger accelerate the healing of experimental wounds Seiring (1936) observed that a mixture of unsaturated fatty acids had a beneficial clinical effect which he believed to be due to a bactericidal action

Thomson, Clayton, and Howard (1941) suggested that in burns oils may form a film comparable to that formed by tanning This film would vary in its physico-chemical qualities according to its components and theoretically carron oil should be preferable to cod-liver oil This hypothesis, however, is not supported by sufficient evidence

In most of the experimental and in all the clinical work summarised above, the criteria of healing were time of closure and rate of decrease in wound size As Young, Fisher, and Young (1941) point out, closure of a wound does not necessarily imply sound healing, and surface observations shed no light on the mode of action of therapeutic substances The present contribution records the histological effects of cod-liver oil on the healing of standard wounds in the rat Since the beneficial action of this oil has been variously attributed to its content of vitamin A, of peroxides and of unsaturated fatty acids, experiments were made not only with the whole oil but also with those two fractions which are separable by distillation, of which the distillate contains all the vitamin A and the residue most of the peroxides, and with substances chemically related to the different components of the oil Thus vitamin A was tested both as a powder (vitamin A naphthoate) and in an oily medium (vitamin A in coconut oil), the latter experiment being controlled by wounds dressed with coconut oil only To study the effect of a peroxidised oil, wounds were treated with peroxidised arachis oil and controls with arachis oil As an example of unsaturated fatty acids linoleic acid and its methyl ester were tested and a series of wounds were dressed with liquid paraffin to investigate the effect of an " inert " oil

MATERIAL, METHODS AND RESULTS

The technique of making standard wounds in rats has already been described (Dann, Glucksmann and Tansley 1941) and the histological methods used in the present study were the same as those recorded in the previous paper Measurements of wound area were not made since experience has shown (Dann Glucksmann and Tansley 1941) that they are useless , the scab measured does not indicate the actual degree of healing and the process of measuring may itself interfere with repair The rats used were 9–18 months old and were fed on a well-balanced stock diet

Since the experiments were done during a period of nearly a year, new control wounds were made at intervals and the results which accord well with those reported in our first paper, are included with the earlier results in the graph relating to untreated wounds (fig 2)

The following substances were applied as dressings cod-liver oil, both the residue and distillate produced by a molecular distillation of cod-liver oil, vitamin A naphthoate vitamin A dissolved in coconut oil, coconut oil peroxidised arachis oil, arachis oil, linoleic acid, methyl linoleate and liquid paraffin All were applied in pastes or powders without a covering bandage

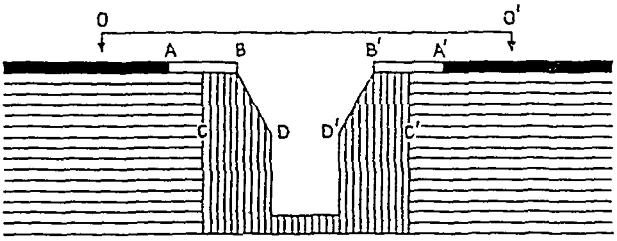


FIG 1—Cross section through a standard wound during the process of healing The original diameter of the wound (OO') is 6 mm The decrease in distance between the cut edges of old epithelium (AA' , continuous line in graphs) and the cut edges of collagen fibres (CC' , dot and dash line in graphs) is due to contraction AB + B'A' and CD + D'C' represent the areas covered by new epithelium (dotted line in graphs) and connective tissue (dash line in graphs) respectively

The method of plotting results employed is as follows As recorded in previous papers, the distance between the cut edges of old epithelium (AA' in fig 1) and old collagen fibres (CC') was measured These measurements (in mm) refer to the contraction of the wound and are plotted against time in days in figs 2–14 (AA' as a continuous line , CC' as a dot and dash line) The measurements of the diameter of areas not covered by new epithelium (BB') and new collagen fibres (DD') are plotted as the difference (AA' − BB') and (CC' − DD') —i e as the diameter of areas covered by new epithelium (short dash line) and new collagen fibres (long dash line) The closure of the wound by epithelial tissue is indicated by a circle marking the juncture of the lines referring to new and old epithelium A black dot indicates the bridging of the wound by collagen fibres The diameter of the original wound area is 6 mm and is subsequently reduced by the contraction of the wound (fig 1) Where there is considerable individual variation in the amount of contraction the average of measurements obtained on successive days is plotted Measurements of regenerative activity show very little individual variation and were not averaged except where a number of animals were killed on the same day Obviously infected wounds were omitted from the graphs

COD LIVER OIL

Two samples were supplied by two commercial firms (series A and B) Sample A (fig 3) contained vitamin A 1200 I U per gramme, iodine value 180, peroxide value 5–6 Sample B (fig 4) contained vitamin A 870 I U per g , iodine value 170–180 peroxide value 7

Reason for use to test effect and examine histological action No of animals 12 in each series No infected 3 in series A, none in series B Application as paste (with talcum) renewed every 48 hours

Results —Series A Cod liver oil promotes collagen regeneration The wound is bridged by fibres on the 7th day as compared with the 10th day in the untreated controls Epithelial regeneration is not affected, the wound being closed on the 9th day as in controls . The size of the scar does not show any significant variation from that of untreated wounds

Series B The results are much the same as in experiments with sample A There is no influence on size of scar There is slight delay in epithelial regeneration and a promotion of collagen regeneration

COD-LIVER OIL DISTILLATE AND RESIDUE

Distillate (fig 5) vitamin A content 1020–1080 I U per g , iodine value 150, peroxide value 0 83 Residue (fig 6) vitamin A content practically 0, iodine value 165, peroxide value 4 6

Reason for use to find whether either fraction is mainly responsible for the effect of cod liver oil No of animals 12 in each series No infected 1 in distillate series Application as talcum paste every other day

Results —Cod liver oil distillate dressings speed up the regeneration of collagen fibres, but greatly delay epithelial regeneration The size of the scar is not different from that of untreated wounds

Cod liver oil residue, though not shortening the latent period of collagen regeneration, accelerates the process once it is started There is no interference with epithelial regeneration The size of the scar is the same as that of untreated wounds

VITAMIN-A NAPHTHOATE

(Fig 7) Vitamin-A content 1,900,000 I U per g , iodine value 0, peroxide value 0 Each rat received six applications of 16,000 I U in 4 days Reason for use to test the effect of vitamin A only on wound healing No of animals 18 No infected 8 Application the powder was sprinkled on the wound every other day, to avoid oxidation the capsules containing the powder were opened immediately before use

Results —Vitamin-A naphthoate does not shorten the latent period in collagen regeneration, but speeds up the actual regeneration of fibres There is a well marked slowing of epithelial regeneration The size of the scar decreases more slowly than in the controls

VITAMIN A IN COCONUT OIL

(Fig 8) Vitamin-A content 10,800 I U per g , iodine value 8–10, peroxide value 0 Reason for use to test vitamin A in an oily medium not containing a great amount of unsaturated fatty acids No of animals 12 No infected 3 Application as talcum paste every other day

Results —As in the vitamin A naphthoate series, there is no shortening of the latent period but an acceleration of collagen regeneration The delay in epithelial regeneration is of the same order as in the vitamin A naphthoate series The decrease in scar size is somewhat retarded

COCONUT OIL

(Fig 9) Vitamin A content 0, iodine value 8–10, peroxide value 0 Reason for use to control above experiment No of animals 15 No infected 3

Results —Coconut oil accelerates collagen regeneration only slightly without altering the duration of the latent period It interferes as seriously as vitamin A in coconut oil with epithelial regeneration The decrease in scar size proceeds at the same rate as in wounds treated with vitamin A in coconut oil

PEROXIDISED ARACHIS OIL

(Fig 10) Vitamin A content 0, iodine value 90, peroxide value 30 Reason for use to examine the effect of peroxidised oils on wound healing No of animals 15 No infected 6 Application as talcum paste every other day

Results —Histologically there is an enormous stimulation of collagen regeneration followed by hyalinisation Epithelial regeneration is delayed and the wound closed on the 17th day The delay in epithelial regeneration is due mainly to the hypertrophy and hyalinisation of the collagen tissue, which interferes mechanically with epithelial migration and retards the contraction of the scar

ARACHIS OIL

(Fig 11) Vitamin A content 0, iodine value 90, peroxide value 0 Reason for use to examine the effect of a relatively unsaturated vegetable oil containing linoleic acid and as a control to peroxidised arachis oil No of animals 18 No infected 8 Application as talcum paste every other day

Results —There is a great stimulation of collagen regeneration and shortening of the latent period Epithelial regeneration, on the other hand, is seriously delayed and the wound closed on the 15th instead of on the 9th day as in the untreated controls

LINOLEIC ACID

(Fig 12) Vitamin-A content 0, iodine value 181 4 peroxide value 0 Reason for use to examine the effect of this unsaturated fatty acid on the rate of wound healing, particularly in view of its beneficial effect on certain skin lesions (Burr and Burr 1930, Hume et al 1940) No of animals 12 No infected 0 Application as talcum paste every other day

Results —Linoleic acid slightly accelerates both epithelial regeneration and collagen regeneration and shortens the latent period in collagen regeneration Decrease in scar size is, however, slightly retarded

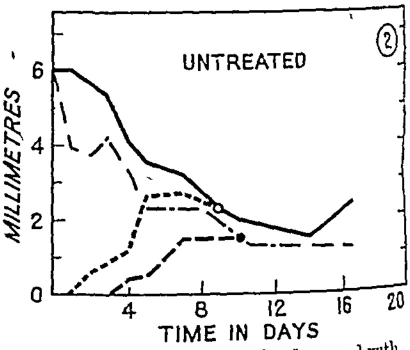


FIG 2—Healing of standard wound with no treatment (Key as in figs 3–14)

METHYL LINOLEATE

(Fig 13) Vitamin A content 0, iodine value 17 , peroxide value 0 Reason for use as source of linoleic acid No of animals 12 No infected 0 Application as talcum paste every other day

Results —Methyl linoleate seriously delays epithelial regeneration Collagen regeneration is promoted but the latent period is not shortened There is only a slow and slight decrease in scar size

LIQUID PARAFFIN

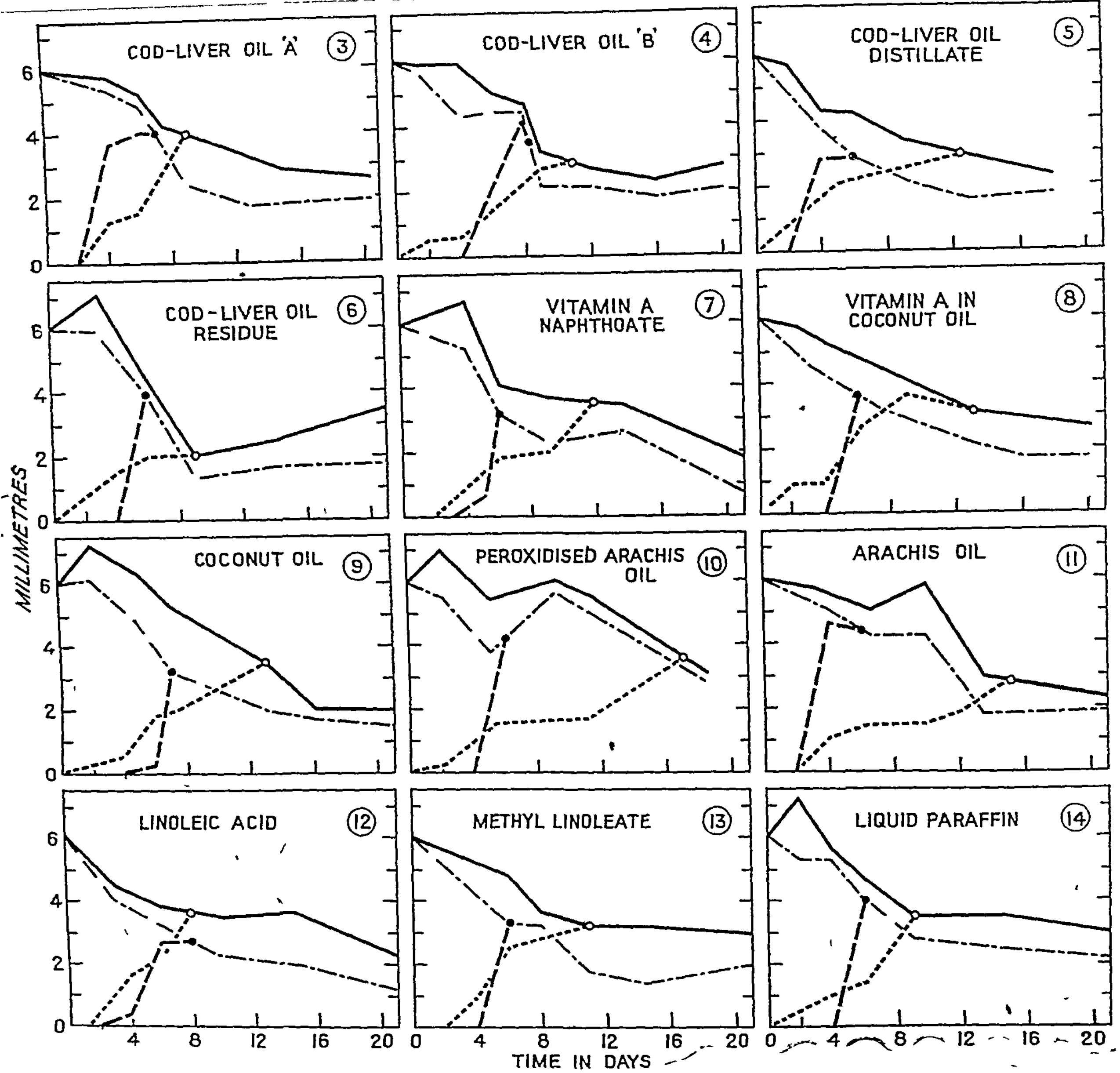
(Fig 14) Fully saturated oil Reason for use a common base for ointments containing vitamin A, &c , it is claimed to be inert by some workers and by others to have deleterious effects No of animals 12 No infected 0 Application as talcum paste every other day

Results —Liquid paraffin promotes collagen regeneration, the wound being bridged by fibres on the 6th day There is no interference with epithelial regeneration and the wound is closed on the 9th day The scar tends to be larger than in the untreated controls

DISCUSSION

In experimental wounds in the rat, the main effect of cod-liver oil, of its two fractions separable by distillation of vitamin A and also of the peroxides and unsaturated fatty acids tested, was to improve collagen regeneration Since all these compounds produced essentially the same result, the beneficial action of cod-liver oil cannot be attributed to any one of its components

Three aspects of collagen regeneration may be affected by treatment—the duration of the latent period, the deposition of fibres and the tensile strength of the scar Under different experimental conditions the latent period may vary from 2 to 4 days, but its duration bears no relation to the rate at which fibres are subsequently formed or to the functional efficiency of the resulting



Charts showing healing of standard wounds treated with various applications

—— *Distance between cut edges of epithelium*
------- *Diameter of area covered by new epithelium*
— — — *Distance between cut collagen fibres*
——— *Diameter of area covered by new collagen fibres*
○ *Closure of the wound by epithelial tissue*
● *Bridging of the wound by collagen fibres*

connective tissue Thus in two experiments the wound was bridged by collagen fibres by the 6th day, but in one (with cod-liver oil residue) the latent period lasted 4 days and in the other (with cod-liver oil distillate) 2 days (cf figs 5 and 6) On the other hand, the speedy regeneration of collagen fibres does not necessarily lead to a satisfactory contraction of the scar (figs 10 and 11)

A comparison of the curves obtained with different treatments showed a close relation between the acceleration of collagen formation and the retardation of epidermal regeneration This was very pronounced in the experiments with arachis oil, which caused hypertrophic regeneration of collagen with the formation of a fibrous "cauliflower" protruding from the surface of the wound and acting as a mechanical obstacle to epithelial migration (fig 11) Having no epithelial covering, the hypertrophic collagen became hyalinised, the hyalinisation spreading from the surface into the depths of the granulation tissue, and it is probable that this still further impeded epithelial regeneration so that a vicious circle was established

Whereas in the untreated controls the epidermis regenerated before the collagen, treatment with any of the substances we have tested, with the exception of linoleic acid caused the regeneration of collagen to overtake that of epithelium (figs 3–11, 13 and 14) This is due partly to the stimulation of collagen formation and partly to the retardation of epithelial growth Of the substances tested, linoleic acid alone slightly improved epithelial as well as collagen regeneration Liquid paraffin and one sample of cod-liver oil did not interfere with epithelial regeneration, the other sample of cod-liver oil together with cod-liver oil residue and methyl linoleate only slightly delayed it, but it was much inhibited by vitamin-A naphthoate, vitamin A in coconut oil, cod-liver oil distillate, arachis oil and peroxidised arachis oil

Our observations afford no evidence that cod-liver oil or the peroxidised substances are bactericidal but the results are inconclusive because the number of animals was not sufficiently large The incidence of infection varied considerably in the different series Thus in one series treated with cod-liver oil 25% of the wounds became infected while in another series there was no infection The greatest number of infections occurred in wounds treated with arachis oil, peroxidised arachis oil and vitamin-A naphthoate

In general, cod-liver oil, its fractions and the substances related to its components seem to act as mild irritants which benefit healing by stimulating the formation of connective (" granulation ") tissue While there is no experimental evidence that cod-liver oil has a direct influence on epithelialisation, in clinical practice it may indirectly promote this process by providing a satisfactory connective-tissue basis It must be emphasised that the present experiments were made on normal animals in which the untreated wound heals rapidly and without complication, and they therefore provide no information about the effect of these substances on an indolent wound

Experiments are now in progress in which cod-liver oil dressings are applied under a plaster-of-paris bandage, it may be mentioned here that a plaster bandage has no significant effect on wounds treated with a cod-liver oil dressing Plaster improves healing, particularly of the epithelium, but this beneficial action is not enhanced by cod-liver oil

SUMMARY

The effects of the following substances on the healing of standard experimental wounds in rats were investigated cod-liver oil, its two fractions separable by distillation, vitamin A (as naphthoate and in coconut oil), arachis oil, peroxidised arachis oil, linoleic acid, methyl linoleate, coconut oil, and liquid paraffin

Collagen regeneration was stimulated to a varying degree by all the substances tested Hypertrophic collagen regeneration in wounds treated with arachis oil interfered with the contraction of the wound and epithelial regeneration

Epithelial regeneration was promoted by linoleic acid only, it was delayed by all the other substances tested with the exception of liquid paraffin and one sample of cod-liver oil

We have pleasure in acknowledging the help of Dr T H Mead, of British Drug Houses Ltd, who supplied us with samples of cod liver oil and of coconut oil, with and without vitamin A as well as vitamin-A naphthoate, and arranged for the molecular distillation of the cod liver oil We must also thank Mr A L Bacharach, of Glaxo Ltd, who supplied another cod-liver oil sample, arachis oil and peroxidised arachis oil, Professor Heilbron who provided the methyl linoleate, Dr I Smedley Maclean who estimated the iodine values, Miss S J Hooper who helped with the experiments, and Mr V C Norfield who made the graphs

We are grateful to Dr H B Fell, director of Strangeways Research Laboratory, for her advice both during the investigation and in preparing the manuscript for press, to the Royal Society for a grant to provide technical assistance, and to the Medical Research Council by whom the general expenses of the investigation were defrayed

REFERENCES

Bosse P (1935) *Dtsch med Wschr* **61**, 1623, 2069, (1936) *Munch med Wschr* **83**, 601
Bruckner O (1935) *Dtsch med Wschr* **61** 2067
Burr, G O and Burr, M M (1930) *J biol Chem* **86** 587
Dann, L, Glucksmann A and Tansley K (1941) *J exp Path* **22**, 1
Escarras, A and Paillas T (1938) *C R Soc Biol Paris* **129**, 312
Heinsius, E (1936), *v Graefes Arch Ophthal* **136** 103
Horn, Z and Sanders S (1934) *Dtsch med Wschr* **60** 1018
Hume, E M Nunn, L C A Smedley MacLean, I and Smith, H H (1940) *Biochem J* **34**, 879
Kirschner M (1937) *Arch klin Chir* **189** 83
Kümmel H and Jensen, W (1936) *Dtsch Z Chir* **248**, 238
Krauter, H (1938) *Pr med* **46** 220
Lauber H T (1933) *Beitr klin Chir* **158** 293 (1934) *Dtsch med Wschr* **60**, 569 (1935) *Ibid* **161** 565
— Rocholl H (1934) *Klin Wschr* **14** 1143
Lohr W (1934a) *Zbl Chir* **61** 1686, (1934b) *Arch klin Chir* **179** 312, (1934c) *Chirurg* **6** 5 (1934d) *Ibid*, p 263
— Unger F (1937) *Arch klin Chir* **189**, 405
Lucke, H (1935) *Dtsch med Wschr* **61**, 967, 1638, 2068
Rotth (1940) *Arch Ophthal*, *N Y* **24** 281
Saitta, S (1930) *Scr biol L Castaldi* **5** 413
Seiring E (1936) *Münch med Wschr* **83** 1632
Steel, J P (1935) *Lancet* ii 290
Strauss, K (1935) *Dtsch med Wschr* **61** 50
Thomson, D Clayton, W and Howard A J (1941) *Lancet* i 341
Young, J S Fisher, A J and Young M (1941) *J Path Bact* **52**, 225
Zacker, K and Spier, W (1938) *Zbl Chir* **65**, 1155

DENTAL FLUOROSIS AND CARIES IN LONDON CHILDREN

MARGARET M MURRAY,
D SC LOND
LECTURER IN BIOLOGICAL CHEMISTRY
BEDFORD COLLEGE FOR WOMEN,
UNIVERSITY OF LONDON

DAGMAR C WILSON,
M D GLASG, M R C P,
F R C O G, D P H
WOMEN'S MEDICAL SERVICE
INDIA (RETD)

THE importance of fluorine as a trace element in human and animal nutrition has hitherto been overshadowed by the clinically more arresting signs of fluorosis, the most obvious of which is " mottled enamel " In America, Dean and his colleagues of the United States Public Health Service (1941) proved that in certain groups of children aged 12–14 years there was a relative immunity to dental caries associated with the intake of natural waters containing fluorine up to 1 8 parts per million They also considered that the threshold for toxic fluorosis was higher than the accepted figure of 1 p p m

In England one of us (Wilson 1941) correlated in a general way the occurrence of fluorosis, as indicated by mottling of teeth, with soils likely to contain fluorine (Bromehead 1941) She also correlated the occurrence of mottling, never of a severe degree, with the Board of Education figures for the percentage of caries free children In an examination of 1048 children in Somerset consisting of two groups, one showing mottled enamel and the other the control group, she proved that greater immunity to caries was associated with fluorosis Since then some Somerset waters have been analysed for fluorine and it is of interest that Long Sutton spring water showed 0 17 p p m while Somerton town supply contained none (Wilson 1941) In the examination of these children it was found that optimum calcification of the mottled enamel was associated with a good state of nutrition, and the suggestion was made that in areas of endemic fluorosis an adequate iodine intake should be assured in order to prevent the possible indirect action of the fluorine on the thyroid gland

INCIDENCE OF MOTTLED ENAMEL AND DENTAL CARIES IN 589 CHILDREN AGED 10–15 YEARS, RESIDENT IN LONDON DISTRICTS

DEGREE OF DENTAL FLUOROSIS *

Severe		Moderate		Mild		Very mild		Doubtful		None	
CE	CT	CE	CT	CE	CT	CE	CT	CE	CT	CE	CT
6	7 (1 1)	7	6 (0 4)	54	15 (0 9)	83	89 (1)	258	559 (2 1)	167	683 (4 1)

* Graded according to Dean et al (1941)

CE = children examined
CT = carious teeth (i e decayed, missing or filled) estimated on naked-eye examination Figures in parentheses indicate average number of carious teeth per child All examinations by one observer (D C W)

The finding of numerous cases of mottled enamel during the examination of the nutritional status of 1400 evacuated London school-children suggested a more detailed inquiry on the same lines as the Somerset investigation The results of this investigation, obtained in July, 1941, and given in the table, were held back until the presence of fluorine in London water had been established The figures show that, including all grades of fluorosis but excluding the questionable, 28% of 589 London children between the ages of 10 and 15 had some mottled teeth The previously reported negative association of fluorosis and caries was again borne out The general nutrition of the children was good and none showed abnormal enlargement of the thyroid gland

With the permission of the Metropolitan Water Board and the collaboration of Colonel E F W Mackenzie M B, we obtained samples of the three main sources of London's water-supply The fluorine was estimated by distillation and colorimetric comparison of the bleaching action of the distillate with that of standard sodium fluoride solutions of a zirconium alizarin lake The results were as follows

Aug 27 1941*	Fluorine p p m
Filtered Thames	0 1
Filtered Lee	0 15
Filtered New River	0 32

Figures for some other subsidiary sources of London's water-supply have been published (Metropolitan Water Board 1936) the highest figure reported was from the Campsbourne well which contained 1 2 p p m of fluorine It must be remembered that any London area tap-water comes from several or many sources but that fluorine occurs in some sources is proved Further work on this is now in progress

The figures obtained for the fluorine contents are very low compared with those reported in other countries and with that of Maldon (Essex) well water, which is 5 p p m (Bowes and Murray 1936), but the degree of fluorosis met with among London children was never very severe It is suggested that such low levels of fluorine intake in water during tooth development are significant in relation to incidence of caries

One of the authors (M M M) wishes to thank the Medical Research Council for a grant for the expenses incurred in connexion with the chemical part of this investigation We are indebted to Mr C N Bromehead of the Geological Survey for help, to the London County Council education committee for the opportunity to examine evacuated London school children, and to Mr W J Cook, L D S, for assistance in Oxfordshire schools

REFERENCES

Bowes J H and Murray M M (1936) *Brit dent J* 60, 556
Bromehead C N (1941) *Lancet*, i 673
Dean H T Jay, P Arnold F A jun and Elvove E (1941) *Publ Hlth Rep*, *Wash* 56 365 761
Metropolitan Water Board (1936) *Rep metrop Wat Supp* 1935
Wilson D C (1941) *Lancet*, i 211, 375

RECURRENT NEUTROPHIL AGRANULOCYTOSIS

BERYL E BARSBY
M B LOND, M R C P D C H
FORMERLY HOUSE PHYSICIAN AT THE ROYAL NORTHERN HOSPITAL, LONDON

H G CLOSE,
M D LOND
FORMERLY ASSISTANT PATHOLOGIST TO THE HOSPITAL

SEVERAL attempts have been made to classify the various cases of agranulocytosis described since 1922 Beck (1933), for instance divided them into five groups fulminating, subacute, subchronic, recurrent and cyclical But none of these classifications has satisfactorily accounted for all the cases since some, like the one to be described here, show the characteristics of more than one group

CASE-HISTORY

A married woman, aged 41, was admitted to the Royal Northern Hospital on Dec 29, 1937, complaining of chronic ill health due to repeated attacks of "influenza" There was nothing relevant in the family history Soon after the birth of her only child (now 14 years old), a nodule appeared in her thyroid gland She had had one severe bout of vomiting which had kept her in bed for 2 weeks but had had no other illness until 4 years before admission, when she had severe tonsillitis followed by purpura and a lung abscess After this illness she had a number of "influenzal" attacks which, she said, came on 3–7 days after a menstrual period During an attack there was slight fever, sore throat mouth ulcers, pink skin spots, joint pains, cough, and abdominal pains with vomiting Between attacks she felt quite well, although any skin lesion became "septic" readily In March, 1937, 9 months before admission, nine-tenths of her thyroid, including a retrosternal cystadenoma, were removed in the hope that her attacks would become less frequent The severe blood loss she had with periods was reduced but her other symptoms became worse

On admission she was thin, although she had not lost weight recently Her face was flushed and her hair was getting grey rapidly Temperature 100° F, pulse rate 80 respirations 20 Edentulous, no buccal ulcers, tonsillar beds clean Few small discrete glands palpable in the neck Neat healthy scar over the site of the thyroid gland Heart and lungs normal Spleen palpable ½ in below the costal margin Right kidney palpable Nervous system normal, no tremor or exaggeration of reflexes Nothing abnormal felt in pelvis Mild osteo arthritis in both knees Blood-pressure, 130/75 mm Hg Wassermann reaction negative Blood urea 30 mg per 100 c cm Blood-sedimentation rate 68 mm in 1 hr (micro method) Fractional test-meal free hydrochloric acid present in stomach Blood culture negative Patient's serum gave no agglutination with suspensions of *Bacterium typhosum*, *Bact paratyphosum* A B, and C and *Brucella abortus* Mantoux reaction positive with a 1/1000 dilution of O T No tubercle bacilli were found in the sputum, either in smears or on culture media The blood showed a mild hypochromic anæmia and a white cell count of 5000 per c mm No neutrophil polymorphs could be seen in the blood smears although a differential white cell count made 6 weeks before admission had shown 19% polymorphs

BONE MARROW DIFFERENTIAL COUNTS

Cells	Jan 1, 1938	May 17, 1938	Normal
	%	%	%
Segmented polymorphs			
neutrophil	15 6	0	9–30
eosinophil	0 4	1	0–3
basophil	0	0 5	0–0 5
Non segmented polymorphs			
neutrophil	27 6	0	20–40
eosinophil	0 4	0 5	0–2
basophil	0	0 5	0–1
Metamyelocytes—			
neutrophil	10 4	0	2 5–12
eosinophil	0 8	0	0–2 5
Myelocytes—			
neutrophil	5 6	0	2–8
eosinophil	0 8	0	0–1
Premyelocytes	2	0	0 5–5
Myeloblasts	0 8	1	0–2 5
Lymphocytes	21 6	82	5–20
Lymphoblasts	0	0	0
Monocytes	2 4	5 5	0 5
Normoblasts	4 8	5	7–19
Erythroblasts	5 6	1 5	2–7
Megaloblasts	1 2	0 5	0–4
Plasma cells	0	2	0–1
Nucleated cells per c mm		12,000	25 000–80,000
Polymorphs in peripheral blood per c mm	3200	0	3500–7000

On the fifth day after admission she began to cough and an abscess formed at the apex of the right lung Polymorphs reappeared in the circulation The changes in the white cells from day to day were then followed and it was found that her attacks came on when the polymorphs had disappeared from the blood (see figure) Seven days after the onset of her next period she again became pyrexial and was found to have a suppurative maxillary sinusitis and agranulocytosis This attack was followed immediately by a period and a high polymorphonuclear count in the blood The patient then went home, but after two more periods, both of which were followed by the usual attacks, she was readmitted with pains and swelling of her elbows, wrists and knees She also had abdominal pain, epigastric tenderness and retching The joints were tender and painful until the next attack began An ulcer appeared in her mouth during the agranulocytic phase and healed with the reappearance of the polymorphs A second lung abscess due to infection by *Staphylococcus aureus* formed The sputum was foul Night sweats had always been troublesome but now became severe As the abscess resolved the polymorph count reached the highest figure of the series (11,000 per c mm) She felt so well at this stage that she discharged herself from the ward, although a fall in the number of polymorphs foreshadowed another attack She reported at the hospital after she had been at home for 6 days She had been feverish and her blood was agranulocytic That night she had severe griping pains and vomiting and diarrhœa Her condition got worse rapidly and she was admitted next day—July 30, 1938—cyanosed and moribund The abdomen was slightly distended and resistant in the right iliac fossa Before a laparotomy could be performed, she died

The autopsy, by Sir Bernard Spilsbury revealed local peritonitis and inflammation round the lower end of the ileum and at the cæcum, a fairly large smooth lined cavity was found in the apex of the right lung, no other significant findings The bone marrow was not examined

BLOOD-EXAMINATIONS

During the 9 months that the patient was under observation the hæmoglobin percentage and red-cell was not sufficiently large. The incidence of infection varied considerably in the different series. Thus in one series treated with cod-liver oil 25% of the wounds became infected while in another series there was no infection. The greatest number of infections occurred in wounds treated with arachis oil, peroxidised arachis oil and vitamin-A naphthoate.

In general, cod-liver oil, its fractions and the substances related to its components seem to act as mild irritants which benefit healing by stimulating the formation of connective ("granulation") tissue. While there is no experimental evidence that cod-liver oil has a direct influence on epithelialisation, in clinical practice it may indirectly promote this process by providing a satisfactory connective-tissue basis. It must be emphasised that the present experiments were made on normal animals in which the untreated wound heals rapidly and without complication and they therefore provide no information about the effect of these substances on an indolent wound.

Experiments are now in progress in which cod-liver oil dressings are applied under a plaster-of-paris bandage; it may be mentioned here that a plaster bandage has no significant effect on wounds treated with a cod-liver oil dressing. Plaster improves healing particularly of the epithelium, but this beneficial action is not enhanced by cod-liver oil.

SUMMARY

The effects of the following substances on the healing of standard experimental wounds in rats were investigated: cod-liver oil, its two fractions separable by distillation, vitamin A (as naphthoate and in coconut oil), arachis oil, peroxidised arachis oil, linoleic acid, methyl linoleate, coconut oil, and liquid paraffin.

Collagen regeneration was stimulated to a varying degree by all the substances tested. Hypertrophic collagen regeneration in wounds treated with arachis oil interfered with the contraction of the wound and epithelial regeneration.

Epithelial regeneration was promoted by linoleic acid only; it was delayed by all the other substances tested with the exception of liquid paraffin and one sample of cod-liver oil.

We have pleasure in acknowledging the help of Dr. T. H. Mead, of British Drug Houses Ltd., who supplied us with samples of cod-liver oil and of coconut oil, with and without vitamin A as well as vitamin-A naphthoate, and arranged for the molecular distillation of the cod-liver oil. We must also thank Mr. A. L. Bacharach, of Glaxo Ltd., who supplied another cod-liver oil sample, arachis oil and peroxidised arachis oil; Professor Heilbron who provided the methyl linoleate; Dr. I. Smedley Maclean who estimated the iodine values; Miss S. J. Hooper who helped with the experiments; and Mr. V. C. Norfield who made the graphs.

We are grateful to Dr. H. B. Fell, director of Strangeways Research Laboratory, for her advice both during the investigation and in preparing the manuscript for press; to the Royal Society for a grant to provide technical assistance; and to the Medical Research Council by whom the general expenses of the investigation were defrayed.

REFERENCES

Bosse, P. (1935) *Dtsch. med. Wschr.* 61, 1623, 2069; (1936) *Münch. med. Wschr.* 83, 601.
Brückner, O. (1935) *Dtsch. med. Wschr.* 61, 2067.
Burr, G. O. and Burr, M. M. (1930) *J. biol. Chem.* 86, 587.
Dann, L., Glucksmann, A. and Tansley, K. (1941) *J. exp. Path.* 22, 1.
Escarras, A. and Paillas, T. (1935) *C.R. Soc. Biol. Paris*, 129, 312.
Heinsius, E. (1936), *v. Graefes Arch. Ophthal.* 136, 103.
Horn, Z. and Sanders, S. (1934) *Dtsch. med. Wschr.* 60, 1018.
Hume, E. M., Nunn, L. C. A., Smedley MacLean, I. and Smith, H. H. (1940) *Biochem. J.* 34, 879.
Kirschner, M. (1937) *Arch. klin. Chir.* 189, 83.
Kummel, H. and Jensen, W. (1936) *Dtsch. Z. Chir.* 248, 238.
Krauter, H. (1938) *Pr. méd.* 46, 220.
Lauber, H. T. (1933) *Beitr. klin. Chir.* 158, 293; (1934) *Dtsch. med. Wschr.* 60, 569; (1935) *Ibid*, 161, 565.
— Rocholl, H. (1934) *Klin. Wschr.* 14, 1143.
Lohr, W. (1934a) *Zbl. Chir.* 61, 1686; (1934b) *Arch. klin. Chir.* 179, 312; (1934c) *Chirurg*, 6, 5; (1934d) *Ibid*, p. 263.
— Unger, F. (1937) *Arch. klin. Chir.* 189, 405.
Lucke, H. (1935) *Dtsch. med. Wschr.* 61, 967, 1638, 2068.
Rotth (1940) *Arch. Ophthal., N.Y.* 24, 281.
Saitta, S. (1930) *Scr. biol. L. Castaldi*, 5, 413.
Seiring, E. (1936) *Münch. med. Wschr.* 83, 1632.
Steel, J. P. (1935) *Lancet*, ii, 290.
Strauss, K. (1935) *Dtsch. med. Wschr.* 61, 50.
Thomson, D., Clayton, W. and Howard, A. J. (1941) *Lancet*, i, 341.
Young, J. S., Fisher, A. J. and Young, M. (1941) *J. Path. Bact.* 52, 225.
Zacker, K. and Spier, W. (1938) *Zbl. Chir.* 65, 1155.

DENTAL FLUOROSIS AND CARIES IN LONDON CHILDREN

MARGARET M. MURRAY,
D.SC. LOND.
LECTURER IN BIOLOGICAL CHEMISTRY, BEDFORD COLLEGE FOR WOMEN, UNIVERSITY OF LONDON

DAGMAR C. WILSON,
M.D. CLASG., M.R.C.P., F.R.C.O.G., D.P.H.
WOMEN'S MEDICAL SERVICE, INDIA (RETD.)

THE importance of fluorine as a trace element in human and animal nutrition has hitherto been overshadowed by the clinically more arresting signs of fluorosis, the most obvious of which is "mottled enamel." In America, Dean and his colleagues of the United States Public Health Service (1941) proved that in certain groups of children aged 12–14 years there was a relative immunity to dental caries associated with the intake of natural waters containing fluorine up to 1·8 parts per million. They also considered that the threshold for toxic fluorosis was higher than the accepted figure of 1 p.p.m.

In England one of us (Wilson 1941) correlated in a general way the occurrence of fluorosis, as indicated by mottling of teeth, with soils likely to contain fluorine (Bromehead 1941). She also correlated the occurrence of mottling, never of a severe degree, with the Board of Education figures for the percentage of caries-free children. In an examination of 1048 children in Somerset consisting of two groups, one showing mottled enamel and the other the control group, she proved that greater immunity to caries was associated with fluorosis. Since then some Somerset waters have been analysed for fluorine and it is of interest that Long Sutton spring water showed 0·17 p.p.m. while Somerton town supply contained none (Wilson 1941). In the examination of these children it was found that optimum calcification of the mottled enamel was associated with a good state of nutrition and the suggestion was made that in areas of endemic fluorosis an adequate iodine intake should be assured in order to prevent the possible indirect action of the fluorine on the thyroid gland.

INCIDENCE OF MOTTLED ENAMEL AND DENTAL CARIES IN 589 CHILDREN AGED 10–15 YEARS, RESIDENT IN LONDON DISTRICTS

DEGREE OF DENTAL FLUOROSIS *

Severe		Moderate		Mild		Very mild		Doubtful		None	
CE	CT	CE	CT	CE	CT	CE	CT	CE	CT	CE	CT
6	7 (1·1)	7	6 (0·4)	54	15 (0·9)	83	89 (1)	258	559 (2·1)	16	6 (4·1)

* Graded according to Dean et al. (1941).

CE = children examined.
CT = carious teeth (i.e., decayed, missing or filled) estimated on naked-eye examination. Figures in parentheses indicate average number of carious teeth per child. All examinations by one observer (D. C. W.).

The finding of numerous cases of mottled enamel during the examination of the nutritional status of 1400 evacuated London school-children suggested a more detailed inquiry on the same lines as the Somerset investigation. The results of this investigation, obtained in July, 1941, and given in the table, were held back until the presence of fluorine in London water had been established. The figures show that, including all grades of fluorosis but excluding the questionable, 28% of 589 London children between the ages of 10 and 15 had some mottled teeth. The previously reported negative association of fluorosis and caries was again borne out. The general nutrition of the children was good and none showed abnormal enlargement of the thyroid gland.

With the permission of the Metropolitan Water Board and the collaboration of Colonel E. F. W. Mackenzie, M.B., we obtained samples of the three main sources of London's water-supply. The fluorine was estimated by distillation and colorimetric comparison of the bleaching action of the distillate with that of standard sodium fluoride solutions of a zirconium-alizarin lake. The results were as follows:

PERCENTILES FOR INTELLIGENCE QUOTIENTS

[redacted]

PATRICK SLATER M A OXFD, D PSYCH
RESEARCH PSYCHOLOGIST AT THE NATIONAL INSTITUTE OF INDUSTRIAL PSYCHOLOGY PSYCHOMETRIC PSYCHOLOGIST TO ST THOMAS'S HOSPITAL

FOR the medical profession the *intelligence quotient* has a definite meaning The patient's responses to a series of questions provide a measure of his mental age this is divided by his chronological age or a conventional equivalent, and the result expressed as a percentage is his I Q It provides an index of his mental capacity which is not liable to fluctuation with age, changes of circumstance or education

Medical men also recognise conspicuous points in the distribution of I Q s among *a normal population* A person with an I Q of 50 or less is presumed to be an imbecile A child with an I Q under 70 is regarded as liable to certification as mentally defective Children with I Q s between 70 and 85 are classed as backward, and are often a source of difficulty to their parents their teachers and themselves With the upper limits of the scale medical men are less concerned but a child with an I Q of 130 is recognised as exceptional, and if he presents a behaviour problem his prognosis given sensible treatment is considered good With this clear outline in his mind the doctor expects to have his patient's mental capacity assessed, when needful in terms of an I Q His preference is one of the most powerful influences helping to retain in practice a system of mental measurement which psychologists generally would be glad to discard at the earliest opportunity The purpose of this article is to explain why psychologists would like to discard the I Q , why medical men should be prepared to let it be discarded, and what sort of scale should take its place The considerations which should influence *medical men are different from those which influence* psychologists and have not received so much publicity Apologies are therefore offered for giving psychologists' considerations first

SHIFTING FOUNDATIONS OF I Q S

An I Q is, as stated a ratio between mental age and chronological age But mental age abstracted from chronological age is an inept fiction The psychological picture of a bright child of 6 is entirely different from that of a dull [illegible] of 13 though his " mental age " may be the same , and the type of test suitable for differentiating him from his comperes is also different To assign them both a mental age of 9 is a solecism—the psychological picture of a normal child of 9 is something different again But this kind of solecism is perpetrated every time an I Q is calculated

Being absurd in itself the concept of mental age produces outcrops of absurdities in all its consequences It is to be found at the root of almost all criticisms of the I Q scale There is an especially fine cluster of absurdities in the calculation of I Q s for superior adults The principles on which items are selected as determinants of mental age would lead to more absurd consequences if they were *not* abandoned whenever inconvenient And when the test is scored principles are abandoned completely the subject is credited with a score of so many marks for each question correctly answered, irrespective of the mental-age level it is drawn from and the total score is described as so many mental months The mental-age classification resolves itself into an expedient for exonerating the psychologist from administering more than a small part of a distressingly cumbersome test The medical man with his habitually pragmatic point of view is content to disregard all these psychological absurdities so long as their net result is to give him *a figure for an I.Q which he can understand and* rely on In deference to him I Q s are still calculated in clinics throughout the country

A request for an I Q is not the same as a request for an intelligence test , technically it restricts the psychologist to the use of the Binet test or one of its derivatives, for these are the only standard tests based on the unfortunate fiction of mental age They are not adapted to developments in the technique of mental measurement provided by Spearman's or any later work Given a certain amount of information, however, arbitrary scales can be made for converting scores in any intelligence test into I Q s It is necessary to know what proportion of *a normal population* scores up to a given limit on the test and what is the limiting I Q for that proportion of the population and the score can then be equated to the I Q But there is little justification for such an expedient It leads to the concealment of essential facts about the limits of the group on which the test has been standardised without which the significance of particular findings cannot be judged

The clear outline medical men have of the meaning of an I Q does not depend for its correspondence to reality *on the use of a specific technique of mental measurement,* but it does depend on the assumption that a valid objective distribution of I Q s for the general population is known This assumption is untenable The units in the I Q scale have no objective significance, different versions of the Binet test give different distributions of I Q s

TABLE I

Per centile	I Q (1916 version)	I Q (1937 version)	Per-centile	I Q (1916 version)	I Q (1937 version)
99	130	143	33 3	95	96
98	128	138	25	92	93
97	125	134	20	91	90
95	122	131	15	88	87
90	116	124	10	85	83
85	113	121	5	78	77
80	110	117	3	76	73
75	108	114	2	73	70
66 6	106	111	1	70	65

Table I taken from Merrill,[1] gives figures for comparing I Q s taken from two versions of the Binet test The figures for the 1916 version are based on 905 cases, those for the 1937 version on 2904 The comparison is made in terms of percentiles The figure 130 given opposite percentile 99 under the heading " I Q (1916 version) " means that 99% of the general population have I Q s of 130 or less on the 1916 version of the Binet scale On the 1937 version the corresponding figure is 143 This means that an I Q of 130 on the earlier scale corresponds to an I Q of 143 on the new scale—a person in the top 1% of the population might have his I Q assessed as 130 + or 143 +, according to the version used The differences in I Q s for given percentiles are more striking in the upper ranges of the two scales but of more concern to the medical profession in the lower ranges Thus if a constant proportion of children with I Q s below 70 are certified as defective, a change from the 1916 version to the 1937 version will lead to a 100% increase in the number of certifications

Table II is taken from the 33rd report of the Industrial Fatigue Research Board It is of interest because the figures for adults have been cited recently in the 22nd report of the Government's Select Committee on National Expenditure

Table II can be rewritten to show the percentiles corresponding to given I Q s The percentage at any level added to the percentages at all lower levels gives the percentile The derived percentiles are given in table III Comparisons can be drawn both between the two columns of this table and between this table and

---

[1] Merrill, Maud A *J educ Psychol* 1938, 29 641

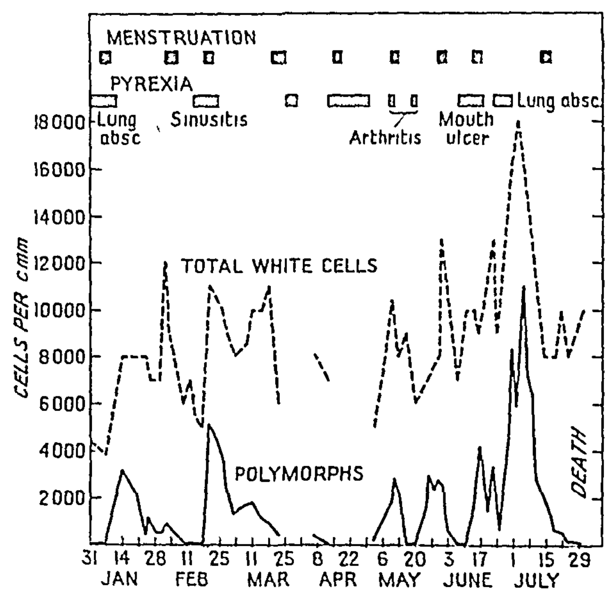
DRS BARSBY AND CLOSE (*continued*)

We have to thank Dr Bruce Williamson and Dr Bentley Purchase, coroner for north east London for permission to use the clinical and autopsy reports

REFERENCES

Beck, R C (1933) *Arch intern Med* 52 239
Chew W B , Stephens D J and Lawrence J S (1936) *J Immunol* 30, 301
Doan C A (1932) *J Amer med Ass* 99 194
Embleton, D (1937) *Proc R Soc Med* 30 980
Hynes, M (1939) *Lancet* i 1373
Jackson H jun (1934) *Amer J med Sci* 188 482
— Merrill D and Duane, M (1934) *New Engl J med* 210, 175
Reznikoff P (1934) *Laryngoscope St Louis* 44 66, (1935) *Amer J med Sci* 195 627
Rutledge B H Hansen Prüss, O C and Thayer (1930) *Bull Johns Hopk Hosp* 46 369
Stephens D J and Lawrence J S (1935) *Ann intern Med* 9 31
Thompson W P (1934) *New Engl J Med* 210 176

count remained more or less constant at about 60% (Haldane) and 3 500 000 per c mm The white cells showed considerable variations and were counted daily while the patient was in the ward, and as often as possible when she was an outpatient, 111 complete white-cell counts were made, and in the figure the number of white cells and polymorphs are shown in relation to her illnesses and menstrual periods The average total of white cells tended to be higher in the later than in the earlier months, but the main interest of the chart lies in the changes in the number of polymorphs They rarely remained at the same figure for more than a day or two, and on five occasions disappeared altogether for 4 or 5 days On each of these occasions the patient had one of her attacks It was even possible to predict the onset of an attack by the gradual fall in the numbers, and the end of an attack by the reappearance of polymorphs in the blood-stream Throughout most of the period of observation the blood also showed a neutropenia—i e , there were less than 3000 polymorphs per c mm Only twice was this number exceeded , for one week in response to sepsis in the maxillary antrum and for three weeks in response to sepsis in the lung The other white cells did not show wide variations in numbers There was a lymphocytosis throughout of 5000 to 7000 per c mm We, like Reznikoff (1938), found that the monocytes were scanty except during the few days before the polymorphs reappeared, when there was a slight monocytosis



Stephens and Lawrence (1935) noted the absence of eosinophils in all but 2 of the 400 white-cell counts made on their case In only 14 of our 111 counts were no eosinophils found , though when present these cells never formed more than 1% of the total white cells Similarly basophils were scanty, though rarely completely absent Differential counts were made on the sternal marrow by Dr Martin Hynes , when the polymorphs were present, and again when they were absent from the blood-stream The results are shown in the table and have been discussed by him elsewhere (Hynes 1939) It will be seen that eosinophils and basophils were found in the marrow even when there was a complete absence of neutrophil forms It would be more accurate therefore to describe the condition in an attack as a " neutrophil agranulocytosis "

When the polymorphs in the circulating blood were at one of their relatively high levels (40%), 69% of the cells in the marrow were neutrophils When no polymorphs were seen in the circulating blood no polymorphs were seen in the marrow The rise and fall of the circulating polymorphs were therefore a reflection of what was happening to their production in the bone-marrow

DISCUSSION

Ætiology —We could find no satisfactory explanation for the intermittent failure of the marrow to produce polymorphs Every effort was made to exclude the well-known causes of agranulocytosis We saw all the prescriptions of the medicines that her doctor had given her, but it was not until after her death that we learnt that our patient had taken 'Yeast-Vite' irregularly to within four months of our seeing her as an outpatient The amount taken was small—less than fifty tablets—and it is improbable that these contained amidopyrin for this has not been an ingredient of the tablets since 1935 Had there been amidopyrin in the tablets, it would still be difficult to explain the *intermittent* effect on the bone-marrow Although it is known that amidopyrin may have a delayed action on the bone marrow (Jackson 1934), we are not aware that anyone has reported an intermittent action Our patient had also been taking " iodised " tablets for nearly two years The amount of iodine in these tablets is little more than a trace, but its effect on the bone-marrow over a period of two years is not known

The patient's story of pyrexial attacks after menstruation made us suspect a hormone as a cause Thompson (1934) had found that, in 17 out of 18 women who had had agranulocytosis, subjective symptoms appeared a day or two after the onset of a menstrual period He also claimed to have established a relationship between the number of polymorphs in the blood and the amount of male hormone and prolan excreted in the urine of a male patient who had had feverish attacks with agranulocytosis every 3 weeks for most of the 20 years of his life Stephens and Lawrence (1935), however, followed the œstrin excretion through a complete menstrual cycle and found "no apparent relationship between the number of white cells in the blood and the amount of œstrin excreted" Through the kindness of Dr W R Spurrell, director of the physiology department at Guy's Hospital, we also tried to estimate the œstrin excreted by our patient during a menstrual cycle, but without success For an unknown reason, 33 out of 38 mice died within 24 hours of being injected with the urine

In an attempt to exclude the possibility of an antineutrophilic substance in the blood, we took serum and urine from our patient when the polymorphs had all but disappeared from the blood and injected them into the peritoneal cavity of guineapigs White-cell counts were done before and 18 hours after injection, as suggested by Chew, Stephens and Lawrence (1936) Presumably there was no antineutrophilic substance in the patient's blood or urine for the polymorphs of the guineapigs were increased, not reduced, after injection

Treatment —Since the nature of the agent which affected the bone-marrow was not known, treatment was empirical and the following were tried unsuccessfully blood-transfusion, injections and oral administration of liver, œstrin, iron, nicotinic acid, pentnucleotide and Armour's yellow bone-marrow

Relation to other cases —From a large number of published reports, we were able to find only 6 cases which resembled ours Of these, 3 (Jackson and Merrill 1934 Reznikoff 1934, Stephens and Lawrence 1935) had had an agranulocytosis at the time of the menstrual period In the other 3 (Rutledge et al 1930, Doan 1932, Embleton 1937) agranulocytosis was not related to the menstrual cycle We followed the blood changes of our patient through 7 menstrual cycles, but we are still not sure that the patient's story is correct and that her agranulocytic attacks occurred a few days after her periods She had an attack after four of her periods when she was apyrexial but not after three when she had a fever and was recovering from a recent attack

Of the 7 cases (ours included) 2 died and 2 recovered, in 2 the condition remained stationary, and the later history of 1 is not known

SUMMARY

A case of recurrent neutrophil agranulocytosis in a woman of 41 is reported

Pyrexial attacks with sore throat, ulcers in the mouth a pink rash, joint pains, cough, abdominal pain and vomiting had recurred 3–7 days after menstrual period for 4 years For the last 7 months at any rate they were accompanied by neutrophil agranulocytosis Autopsy showed pericæcal inflammation and a lung abscess

No cause for the blood changes could be found

Continued at foot of opposite page

enlargement of lymph glands in the portal fissure obstructing the bile passages seems to be supported by the fact that the jaundice deepened while those glands which could be palpated were enlarging In differential diagnosis lymphatic leukæmia and Weil's disease present the chief immediate difficulties, although diffuse lymphatic enlargement is uncommon in the latter Full blood investigations will, of course, at once decide the diagnosis

---

GLANDULAR FEVER WITH JAUNDICE

STEPHEN GOLD, M B CAMB
TEMPORARY ASSISTANT MEDICAL OFFICER AT WEST MIDDLESEX COUNTY HOSPITAL

A WOMAN of 20 took to her bed on July 25, 1941, complaining of pain in the epigastrium Two days later she had a severe epistaxis, the epigastric pain, now more a discomfort, continued, she was feverish and sweated profusely at night She had completely lost her appetite and this was followed by the continual nausea with vomiting after food On the 30th she complained of a sore throat and noticed enlargement of glands in her neck On questioning she said her urine had been unusually dark

As well as measles and whooping cough when a child, she told of an illness "similar" to this one two years ago It was diagnosed as "kidney trouble, pleurisy and muscular rheumatism" but its exact nature remains obscure

On admission to the West Middlesex County Hospital on Aug 2 the patient was ill, febrile and jaundiced, she indignantly denied the jaundice, for she has always claimed a dark skin Her throat was injected and both submandibular glands enlarged There were no bleeding patches in the mouth and neither gums nor teeth were abnormal Enlarged glands, if they were present on admission, were overlooked and apart from the submandibular ones were not noticed by the patient There was no clinical evidence of enlarged mediastinal glands and their absence was subsequently confirmed by X ray The liver was enlarged one finger's breadth, and the spleen even more, both were tender on palpation The pulse rate was regular at 88, which, compared with the temperature of 99 5° F was slow The heart was not enlarged but a well-marked hæmic bruit was heard over the pulmonary area There was no skin eruption The urine was very dark and loaded with bile The stools were correspondingly pale

A diagnosis of simple catarrhal jaundice was made, Over the next three days the fever continued (99 4°–100° F), the jaundice increased and the patient still complained of nausea, vomiting and soreness of the throat By Aug 5th some biochemical investigations had been performed on the serum revealing serum bilirubin 23 3 mg per 100 c cm, icterus index 150 units, van den Bergh reaction strongly positive direct These findings all pointed to a severe degree of obstruction of the bile ducts, a clue as to the cause was provided on the 6th by the blood count red cells 5,500,000, hæmoglobin 90%, white cells 14,200 (polymorphs 37%, lymphocytes 56%, monocytes 7%) The majority of the lymphocytes presented a reticulated appearance highly suggested of glandular fever On this news the patient was hastily revisited and four lymph glands were found palpably enlarged They were painless, though tender on pressure, and were situated in the right axilla, right suboccipital region and two in the right groin The Paul Bunnell test was positive on Aug 7 at a dilution of 1 in 128 The Wassermann reaction was negative By Aug 9 the patient's general condition had not materially altered, but there had been a further absolute increase in the circulating lymphocytes white cells 19,200 (polymorphs 15%, lymphocytes 75%, monocytes 10%) The serum bilirubin was slightly less than in the previous estimation, the van den Bergh was unchanged Both the bone-marrow, as obtained by sternal puncture, and the red-cell fragility were normal

The low fever (up to 100 4° F) continued until Aug 22, after which the temperature remained normal By that date the jaundice, clinically and biochemically, had disappeared The glands that were previously enlarged had regressed and the spleen was only just palpable On the 18th the Paul-Bunnell test was positive to 1 in 64 On the 19th she complained of an acute pain in the right hypochondrium and gave a positive Murphy's sign This was assumed to be a mild cholecystitis with the passage of pigmentary gravel In two days it had disappeared On the 20th the white cell count was 6000 (polymorphs 48%, lymphocytes 42%, monocytes 8%, eosinophils 1%, basophils 1%)

The occurrence of jaundice in glandular fever is mentioned by Tidy,[1] Whitby and Britton [2] and Downey [3] These authorities ascribe the jaundice to an associated hepatitis, only Tidy mentions that it may be due to enlargement of glands in the porta hepatis, obstructing the bile-duct Tidy says that all recorded cases except one have been in adults In this case the serum liberation had begun to fall before the number of mononuclear cells had reached its peak

---

RELAPSING FEVER

HUGH S STANNUS,
M D LOND, F R C P
SENIOR PHYSICIAN TO THE FRENCH HOSPITAL LONDON

MAXIMILLIAN BENDIT,
M D PARIS
HOUSE PHYSICIAN AT THE HOSPITAL

WAR, famine and epidemic diseases have been bound together throughout history, and relapsing fever, often hand in hand with typhus (both mothered by the louse), has commonly been a scourge—for example in Russia, south-eastern Europe and Asia Minor after the last war

Relapsing fever was common enough in Great Britain in the eighteenth and nineteenth century, with notable major outbreaks in the more insanitary quarters of the large cities—Dublin, Glasgow, Edinburgh, Manchester, Liverpool and London The deaths registered in England in the last epidemic years were 139 in 1869, 628 in 1870, 327 in 1871, 63 in 1872, and 41 in 1873 During the thirty years 1874–1903 a total of 366 deaths from relapsing fever were registered, and in the five years 1904–1908 only 14 In the twenty years 1908–1937, according to the Registrar-General's annual report (England and Wales) for 1938, there were 40 cases notified, 39 of them being among civilians Thus relapsing fever is now rarely seen in this country, but the fact that the greater part of Europe and the Near East is a theatre of war, coupled with the development of rapid transport, may bring the disease nearer home The following case is therefore recorded

CASE-HISTORY

A Belgian aviator, aged 25, was admitted to the French Hospital on July 30, 1941, with temperature 103° F, pulse-rate 84 He complained of no symptoms, and except for a dirty tongue and constipation had no abnormal physical signs The rise of temperature had been accompanied by shivering, and a fall to 98° F next day was associated with profuse sweating and a feeling of exhaustion On admission the urine was normal, stool examination negative, blood-culture sterile The temperature reached normal 4 days later and remained so for a week, then it began to rise again In the light of a history of a previous febrile attack in Lisbon before admission, beginning on July 13 and lasting 5 days, a diagnosis of relapsing fever was made and immediately confirmed by examination of a blood-film In this, the second relapse, the temperature reached 103 4° F, pulse rate 104, both became normal on the fourth day Ten days later what appeared to be an abortive relapse was signalled by a slight rise of temperature, but thereafter uninterrupted convalescence ensued No treatment was given

From his history it appears that he was shot down at the time of the Belgian collapse, escaped to France, which he traversed as a refugee, and entered Spain in an attempt to reach Portugal In Spain he was imprisoned from Oct 26 to Nov 10, 1940, and afterwards sent to a concentration camp whence he escaped on Feb 7, 1941, and made his way back to unoccupied France, he remained there until June 15 when he managed to slip over the border, to cross Spain, this time evading capture, and to reach Lisbon on July 13, where he was smitten down the day of his arrival with the first attack of fever During his many months of wandering and imprisonment he had suffered great privation All the inmates of the prison were lousy, they were gnawed by rats and much attacked by fleas The patient does not recall being bitten by ticks In relapsing fever the incubation period is commonly 6–10 days, but may be much shorter or in some cases longer It is therefore probable that he was infected in Spain table I Thus table I I Q (1916 version) gives the percentage of the population with I Q s of 85 or under as 10 In table III the percentages given are 26·2 (adults) and 11·7 (children) Since an I Q of 85 is accepted as marking approximately the upper limit of the backward group these differences are momentous It is also difficult to believe that 7·2% of the adult population have I Q s at or below the limit which for children generally implies liability to certification for mental defect The 1929 report of the Mental Deficiency Committee gives the percentage of certified defectives of all ages as 0·157

---

[1] Tidy H L *Lancet* 1934 ii 184 and 236

[2] Whitby L E H and Britton C J C Disorders of the Blood, London

[3] Symposium of the Blood, Wisconsin 1941

The I F R B report refers the data in table II to an article by Burt[2] No indication is given in any of these publications of the number of cases on which the figures are based, but it is clear that unless the number of cases were very small, the differences between children and adults are too great to have arisen from random sampling of a common population Burt's article however seems to imply that the figures of the adult percentages have been obtained inferentially, the types of vocation suitable for children of given I Q s were classified and the proportion of the adult population following those trades was taken to provide the corresponding percentages within the same I Q limits It is surprising that the Select Committee chose this source for their data

TABLE II

I Q	Per cent (adults)	Per cent (children)
150 or over	0·1	0·2
130–150	3	2
115–130	12	10
100–115	26	38
85–100	33	38
70–85	19	10
50–70	7	1·5
under 50	0·2	0·2

TABLE III

I Q	Percentile (adults)	Percentile (children)
150	99·9	99·8
130	96·9	97·8
115	84·9	87·8
100	58·9*	49·8*
85	26·2	11·7
70	7·2	1·7
50	0·2	0·2

* The total of the second column in table II is 100·3 and of the third 99·9 Corrections have been applied in table III where they seem most reasonable

ADVANTAGES OF PERCENTILES

Comparison between all these different distributions can be made in percentiles The percentile gives the meaningful interpretation of a test score by showing just how common or exceptional it is Percentile scales can be prepared for any quantitative psychological test, and used to provide data for comparing individuals with general or with specialised groups The percentile does not conform completely to Fisher's requirements for an efficient statistic But it has several very conspicuous merits which make it the most desirable general term for recording psychometric results A complete table of percentiles, given with the number of cases on which it is based, furnishes a full description of any distribution and further statistics can therefore be derived from it as required It is independent of assumptions with regard to the form of the distribution of any theoretical population It provides a basis for calibrating one psychological test with another It furnishes in the simplest and clearest form the information which practitioners and lay people require when making use of psychometric material Medical men would benefit themselves by obtaining more reliable information from a greater variety of tests and would help psychology to put its house in order if they made a practice of requiring psychometric results to be returned to them in the form of percentiles

SUMMARY

Doctors are used to having the intelligence of patients assessed in I Q s Various disadvantages arise, notably

1 The I Q scale applies properly only to a restricted number of tests—those which measure mental age Such tests involve unsound assumptions and do not satisfy modern scientific requirements

2 Different versions of the same test, and a fortiori different tests give different distributions of I Q s I Q s obtained from different tests are therefore not comparable

3 Fitting an I Q scale obscures the data on which a test is standardised

Doctors need psychological tests particularly for differentiating defectives, backward children and precocious children who are found respectively in the bottom 1% of the population the bottom 10% and the top 5% approximately The first the 10th and the 95th percentile define the limits within which these cases fall on a percentile scale I Q s do not define these limits reliably, since their distributions vary The percentile scale can be fitted to any quantitative psychological test, and is recommended as the most suitable for clinical and general purposes

---

[2] Burt, C *Brit J Psychol* 1924, 14, 336

GLANDULAR FEVER WITH JAUNDICE

A BARHAM CARTER, M D CAMB, M R C P, D P M

PHYSICIAN TO THE CENTRAL MIDDLESEX COUNTY HOSPITAL

JAUNDICE is an unusual complication of glandular fever, and recently Martin,[1] in an article describing 2 personal cases, mentions that he was able to find only [illegible] recorded examples In the following case well marked jaundice appeared during the course of typical glandular fever

A woman, aged 28, was admitted to the Central Middlesex County Hospital on July 15, 1941 She was quite well until ten days before admission, when she noticed swellings on both sides of her neck, complained of sore throat and shivering, and had a temperature of 100° F She felt sick, unduly tired, and vomited once Five days before admission she was examined by Dr H G Letcher who found enlargement of cervical (including submaxillary and suboccipital) axillary and inguinal glands These glands were discrete and slightly tender, and the patient said they had already begun to get smaller Her temperature was 99·4° F, her throat was injected and a provisional diagnosis of glandular fever was made Two days later (a week after onset) a faint icteric tinge developed in her conjunctivæ, and gradually increased to definite jaundice, with a palpable spleen and persistent glandular enlargement

On admission she was jaundiced and showed diffuse enlargement of the glands mentioned above, which were slightly tender and soft Her spleen was palpable, her gums were normal, there was a purpuric patch on the left shin 2 in square without history of injury The liver was palpable 1 in below the right costal margin, smooth, tender and soft, and bile was present in the urine Pulse rate 110, respiration 20, temperature 100° F The diagnoses considered were glandular fever, lymphatic leukæmia and mild spirochætosis icterohæmorrhagica Next day the patient had an epistaxis of approximately 2 oz and slight hæmorrhage from the vagina, although menstruation was not expected, this hæmorrhage lasted only a few hours, and after a further epistaxis of 3 oz next day there was no further bleeding The stools were clay coloured for two days and slightly relaxed, and then returned rapidly to normal Bile persisted in the urine

—	July 16	July 19	July 23	July
White cells per c mm	16,900	15,700	13,000	[illegible]
Polymorphs %	10	12	21	30
Lymphocytes %	66	66	73	66
Monocytes %	24	22	6	4
Van den Bergh (direct) reaction	Pos delayed 20 sec	Pos delayed 60 sec	Pos delayed 30 sec	Neg
Serum bilirubin (mg per 100 c cm)	22·5	[illegible]	18·[illegible]	1
Bleeding time (min)	5	4	2	
Clotting time (min)	1			
Paul Bunnell reaction	Pos 1/256		Pos 1/256	Neg 1
Stools	Pale	Normal	Pale	Normal
Urine	Bile +	Bile +	No bile	No bile

The clinical picture slowly improved until six days after admission (July 21), when there was some increase in the jaundice, with renewed pyrexia up to 99·4° F, and pallor of the stools, and the glands began to enlarge further After this exacerbation the condition again gradually improved and the jaundice had disappeared by the 25th, the pyrexia by the 27th and the glands by the 31st, sixteen days after admission The spleen was not palpable after the 24th, and the patient was discharged well on Aug 3 The total duration of the jaundice was thirteen days The results of investigations are given in the table

This patient showed an obstructive type of jaundice Martin's theory that the jaundice may be caused by tendency of the sulphonamides group to produce the same condition In this case the drug though given intensively, had no influence on the white cells If anything the number of white cells actually increased during the treatment, the shift to the left of the Arneth index improved, and the eosinophils reappeared The agglutination a week after the beginning of the disease was positive The fact that the agglutination after four weeks had not increased in titre may be explained by the quick disappearance of the bacilli

---

[1] Martin, L *Lancet*, 1941 ii 481

I wish to thank Messrs May and Baker for placing their bibliography of the subject at my disposal

REFERENCES

Bazin A T. (1938) *Canad med Ass J* 38, 559
Douthwaite A H (1939) *Lancet* i 1401
Harries, E H R. Swyer R and Thompson N (1939) *Ibid*, p 1321.
Hughes T L and Harwood H F (1940) *Ibid* ii, 601
Patel T B (1941) *Antiseptic*, 38 105
Stanyon J H (1940) *Canad med Ass J* 42 66

URINARY CALCIUM IN NUTRITION SURVEYS

THE SULKOWITCH TEST

GEOFFREY C LINDER. M.D LOND, M.R C P
JOHAN M LATSKY. M SC STELLENBOSCH
(Depts of Pathology and Medicine, University of Cape Town)

IN 1937 Barney and Sulkowitch introduced a simple test for the detection of excessive urinary calcium excretion in patients suspected of hyperparathyroidism

In this, 5 c cm of a buffered oxalate solution are added to n equal amount of urine which is acid to litmus, the test-ube is inverted and shaken, and the turbidity caused by the recipitation of calcium oxalate is observed after 2 min An mmediate dense cloud indicates a high concentration of alcium which demands further investigation, and the absence f any precipitate almost always rules out excessive parahyroid activity When the test is done the diet must e free from milk and acidifying agents which may cause emporary increases in calcium excretion

Albright (1939) recommended this test for control of he treatment of tetany with dihydrotachysterol and ave the following interpretation of the results If here is no precipitate the serum-calcium level is probbly between 5 and 7.5 mg per 100 c cm , a fine cloud ndicates that the serum calcium is at a satisfactory evel; and if the precipitate looks like milk there is a langer of hypercalcæmia He applied the test to atients on a high calcium diet and reduced the dose of ihydrotachysterol as soon as a heavy cloud appeared n this way he claims to keep the serum calcium at a safe lightly subnormal level He found that a normal erson on a very low calcium diet might excrete an ccasional specimen which failed to give a precipitate nd that almost any normal person after drinking a arge amount of milk will show excess of calcium in the rine.

It seemed possible that this test might be of use for detecting abnormalities in calcium metabolism in nutrition surveys The test was therefore applied to 114 children who were being studied in the Cape Nutrition Survey, and at the same time a specimen of blood was taken for determination of calcium inorganic phosphorus and phosphatase By clinical examination and grading tests the children were classified as 59 normal, 49 malnourished and 6 diseased, their ages were 9–15 years They were studied as outpatients and arrived at the clinic after their normal home breakfast which contained more or less milk It was recognised that some children who had a low serum-calcium might be excreting calcium because the breakfast had contained a liberal amount of milk but this seemed unlikely to happen in the case of those usually receiving an insufficient amount of calcium in their diet It was expected that a few children with a habitually low calcium might be missed for this reason, but that those with no calcium precipitate would certainly have a low calcium as described by Albright

METHODS AND RESULTS

The methods used were that of Clark and Collip (1925) for calcium and that of Bodansky (1932–33) for phosphorus and phosphatase Table I gives the number of children in whom the Sulkowitch test was "clear," "faint" and "thick" and the mean of the serum calcium inorganic phosphorus and phosphatase determinations in each category with their standard deviations It is obvious that there is no difference between the mean serum calcium of the group with a "clear" test and of that with a "faint" test Between the means of the "clear" and the "thick" the difference is 0.31 mg This difference was examined by the method (Tippett 1931) for the comparison of the means of small samples "t" was 1.87, which from Fisher's (1938) table gives a value between 0.1 and 0.05 for p To be statistically significant p must be less than 0.05 and therefore there is no proof of any real difference between the means of the extreme groups

TABLE I—MEAN CALCIUM, INORGANIC PHOSPHORUS AND PHOSPHATASE IN THE SERUM OF CHILDREN CLASSIFIED ACCORDING TO RESULT OF SULKOWITCH TEST

Sulkowitch test	Calcium			Inorganic phosphorus			Phosphatase		
	obs	mean (mg *)	S D	obs	mean (mg *)	S D	obs.	mean (units)	S D
Clear	46	9.47	0.86	41	4.46	0.73	37	9.3	3.3
Faint	37	9.54	0.65	33	4.47	0.82	32	10	3.8
Thick	31	9.78	0.54	32	4.28	0.95	28	8.1	3.5

Obs, number of observations. S.D standard deviation
* per 100 c cm

Similar examinations were made of the mean serum inorganic phosphorus and the mean phosphatase values of the "clear" and "thick" groups The values of p were 0.2 and 0.2–0.1 respectively, so that there is even less evidence that these means are different

A further examination was made to see whether a low serum calcium a low serum inorganic phosphorus or a high phosphatase was significantly more frequent in any group Low inorganic phosphorus and high phosphatase were found in all groups almost equally commonly but the incidence of a serum calcium below 8.5 mg per 100 c cm did vary (table II) The incidence of serum calcium concentrations below 9 mg per 100 c cm, however showed no statistically significant differences.

TABLE II—INCIDENCE OF LOW SERUM CALCIUM IN CHILDREN GROUPED ACCORDING TO RESULT OF SULKOWITCH TEST

Sulkowitch test	No in group	Serum calcium under 8.5 mg per 100 c.cm	Difference of percentages	S E of difference	Difference/S.E.
Clear Faint and thick	46 68	15.2 2.94	12.26	5.7	2.15
Clear Faint	46 37	15.2 5.4	9.8	6.5	1.5
Thick Clear and faint	31 83	0 10.84	10.84	3.41	3.18

S E, standard error

The data in table II show that it is more likely that a serum calcium below 8.5 mg per 100 c cm will be found among the children with a "clear" test since the value of the difference of the percentages divided by its standard error is greater than 2 This supports to some extent the claims for this test but does not seem to have any practical application in a nutrition survey. The table also shows that a child with a "thick" Sulkowitch test is unlikely to have a serum calcium below 8.5 mg. per 100 c cm and in this series 27% of the children had a thick test From this it appears that if serum calcium alone is being determined in a survey as an indication of vitamin D and calcium sufficiency then the Sulkowitch test could be used to save bleeding and calcium determination in about a quarter of the children without missing an appreciable number with a serum calcium under 8.5 mg per 100 c cm This is the most that can be claimed for the Sulkowitch test in this connexion

It was shown that if several cups of water were given to children arriving with a "thick" test the urine

DISCUSSION

The commoner symptoms include a rapid rise of temperature to 102°–104° F. with rigor, headache, pains in the limbs, flushed face and eyes, nausea and vomiting, epistaxis, and enlargement of the liver and spleen; jaundice and bronchitis may occur; in a few cases a macular rash may be noted and occasionally iritis. The initial attack lasts 4–9 days, and is followed by an afebrile interval of 11–15 days. In the relapse the febrile period is commonly shorter and the second interval longer. The temperature may fall by lysis or crisis, and the drop is accompanied by profuse sweating. In the ordinary louse-borne disease it is uncommon for patients to have more than one relapse, but the number varies in different epidemics.

In the case reported here two features are of interest: the mildness of the symptoms and the number of the relapses. Lack of severe symptoms is characteristic of a form of the disease met with in Spain and transmitted by ticks (*Ornithodorus marocanus* and *exoticus*), belonging to the same genus as those which carry tick fever in Central Africa (*O. moubata*), in South America (*O. venezuelensis*), Persia and Northern India (*O. tholosani*). It seems possible therefore that our case is one of endemic relapsing fever, with the tick as the vector, rather than a case of the epidemic type carried by the louse.

After the discovery of the causal organism in different parts of the world it was believed for a time that there were different species, to which specific names were given: *Spirochæta obermeieri* (Europe), *S. carteri* (India), *S. duttoni* (Africa), *S. novyi* (North America), *S. venezuelensis* (South America), *S. berbera* (Persia and N.W. India) and *S. hispanica* (Spain). They are now all grouped together under the simple denomination of *S. recurrentis*.

PARATYPHOID FEVER

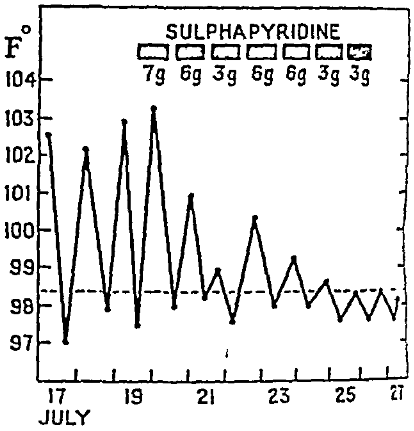
A CASE TREATED WITH SULPHAPYRIDINE

FRITZ MULLER, M.D. BERLIN, L.R.C.P.E.
CLINICAL ASSISTANT AT PADDINGTON GREEN CHILDREN'S HOSPITAL

COMPARATIVELY few cases of typhoid and paratyphoid fever treated with the sulphonamides have been reported, and in these the results have been conflicting. Stanyon (1940) had a spectacular success in an accurately observed case of typhoid fever treated early with sulphapyridine. Treatment was started on the sixth day of the disease. The temperature dropped to 99° F. within 48 hours, and after a fortnight the patient was discharged from hospital, two negative stools having been obtained. Harries, Swyer and Thompson (1939) treated a number of typhoid-fever cases with insufficient doses of sulphanilamide given rather late in the course of the disease. They were favourably impressed, but the results were not conclusive. Douthwaite (1939) warns against the use of these drugs in view of the leucopenia in enteric fevers. Patel (1941) treated 23 cases of typhoid fever with sulphapyridine. Treatment was started between the seventh and twelfth days of the disease and continued for seven days. In 2 patients who had pneumonia as a complication the temperature came down by crisis and did not rise again; in all the others the drug had no effect. Bazin (1938) succeeded in freeing an obstinate carrier of *Bacterium paratyphosum B* from bacilli very quickly. Hughes and Harwood (1940) treated a number of cases of paratyphoid fever with sulphanilamide. In these the length of the pyrexia was not influenced, but fæces and urine became sterile quicker than in the control cases.

The following case of paratyphoid fever, observed in private practice, was treated early with sulphapyridine—actually before it was diagnosed.

On July 16, 1941, I was called to see a man, aged 27. He had been indisposed for 24 hours, and complained of frontal headaches and stuffiness in his nose. Temperature 102.6° F., pulse rate 102; slight inflammation of pharynx; otherwise nothing abnormal. On July 18 a papular rash appeared on his legs and forearms. On the 19th there was a morbilliform rash, more profuse on the legs and forearms, spreading to the thigh, face and neck; there were a few smaller spots on the abdomen and chest, somewhat larger than the rose spots of typhoid fever. The patient looked gravely ill, and complained of headache. Tongue furred, brownish; pulse rate 104; blood pressure 100/65 mm. Hg; heart sounds of poor tone; no stiffness of neck; Kernig sign negative; left ankle joint swollen; both ankle joints, right knee joint and both wrist joints tender and painful on movement; spleen not definitely palpable; no meteorism; daily rise of temperature from subnormal to about 103° F. (see figure) accompanied by a chilly feeling, fall of temperature accompanied by profuse sweats; no stool for the previous 3 days. Urine, traces of albumin, urobilin present, nothing abnormal microscopically. White cells, 4600 at first count, 5000 at second; (segmented neutrophils 41%, stabs 20%, juveniles 10%, lymphocytes 21%, monocytes 9%, a few metamyelocytes). Diagnosis: septicæmia caused probably by *Bact. paratyphosum B* or meningococcus. Sulphapyridine given 4 hourly, 7 g. in the first 24 hours. July 20, temperature maximum 100.8° F., no chill; herpes labialis. Sulphapyridine 6 g. for next 24 hours. July 21, patient feeling much better, apart from sickness due to drug; joint pains much improved; spleen felt, 1½ in. below lower border of ribs, fairly firm; more spots on abdomen and chest. White cells 5000 at first count, 5700 at second; (segmented neutrophils 47%, stabs 17%, juveniles 4%, lymphocytes 19%, monocytes 13%). Maximum temperature 99° F. Sulphapyridine reduced to 3 g. for next 24 hours because of sickness. July 22, blood culture negative. Urine, some urobilin present; diazo reaction positive. Temperature rose to 100.4° F. in the afternoon. *Sulphapyridine increased to 6 g. in next 24 hours.* July 23, blood culture specially for meningococci negative. Agglutination test positive 1/125 for *Bact. paratyphosum B*. Sulphapyridine, 6 g. daily continued. July 24, pains in joints disappeared; no more eruptions of rash; temperature taken two hourly, normal all day. White cells 5800 at first count, 6600 at second; (segmented neutrophils 44%, stabs 9%, juveniles 4%, eosinophils 3%, small lymphocytes 19%, large lymphocytes and monocytes 20%, basophils 1%, 1 myelocyte, some metamyelocytes). Temperature has remained normal ever since. Two subsequent examinations of stools were negative. Widal test after four weeks: positive 1/125, negative 1/250. Patient had never been vaccinated against typhoid or paratyphoid fever.



DISCUSSION

The diagnosis of paratyphoid B is proved by the form of the rash, not uncommon in this disease, the enlarged firm spleen, herpes labialis, the laboratory findings of leucopenia, positive diazo reaction and positive agglutination test. The blood-cultures, for technical reasons made rather late, were expected to be negative under intensive treatment with sulphapyridine. The first examination of the fæces was made after 32 g. of sulphapyridine had been given. The negative finding corresponds with the experience of Bazin and that of Hughes and Harwood, who noted quick disappearance of paratyphoid bacilli under treatment with *sulphonamides*. The clinical success seemed spectacular, more to the patient and those in attendance than the temperature chart could convey. The patient, who looked toxic and gravely ill, was completely changed within 36 hours. The course of the paratyphoid fever was that of septicæmia without symptoms of the gastro-intestinal tract except obstinate constipation, so the case probably offered better prospects for chemotherapy than if the process had been localised in the lymph apparatus of the intestine. Infection with *Bact. paratyphosum B* occurs more often in a septicæmic form, and is generally diagnosed earlier than typhoid fever and is thus more suitable for chemotherapy. The leucopenia characteristic of the disease should be k

Compensation neurosis.—Whatever method of treatment is adopted the mental attitude of the patient will influence the degree and rapidity of his recovery. Fractures of the os calcis occur, as a rule, in window-cleaners, steel-erectors and other men who work at some height above the ground. The prospect of returning to work on the ladder or the scaffolding after a serious accident must often be unpleasant, and reluctance to do so is encouraged by the machinery of the Workmen's Compensation Act. In this regard simplicity of treatment is a virtue. The ordeal of reduction, and the formidable apparatus of immobilisation in the modern technique are likely to impress the patient with the serious nature of his injury. If this preoccupation can be avoided, so much the better.

OTHER METHODS OF REDUCTION

Bankart (personal communication) has exposed the fractured bone experimentally in a few cases and moulded it under direct vision. Internal fixation has been employed by some surgeons. Lenormant and Wilmoth used bone grafts; Bankart has at times inserted a metal screw in the long axis of the bone. In general, procedures involving open operation fail because the fractured bone is so spongy as to be unmanageable. Henderson (1930), Hermann (1937) and Yoerg (1937) recommend reduction by manipulation. All these types of treatment are subject in some degree to the disadvantages already considered. Primary subastragaloid arthrodesis is a method of treatment which is still on trial.

Conservative treatment.—In former times crush fractures of the os calcis were not subjected to much interference. Hogarth Pringle (1910) advised the following treatment:

> "Fractures of the tuberosity should be fixed by operation whenever there is much separation of the fragments, otherwise they, and all the fractures of the body of the bone, are best treated by massage, with elastic pressure between the sittings, and passive movements in the course of a week. These fractures are often long in consolidating and the patients frequently have much trouble from them afterwards, pain in the sole of the foot, and below the external malleolus, and in the calf of the leg being often complained of, along with difficulty in walking; it is often three or four months before the patient can bear his weight in locomotion after this fracture."

RESULTS OF CONSERVATIVE TREATMENT

GROUP 1. REST, MASSAGE AND EXERCISES

Case	Occupation	Sex	Age	Fit for work in (weeks)
1	Porter	M	47	12
2	Housewife	F	53	14
3	Porter	M	55	16
4	Window-cleaner	M	38	16
5	Carpenter	M	56	26†
6	Decorator	M	63	16
7	Window-cleaner	M	38	26
8		M	34	14
9	Fitter	M	46	Rt failure ‡ Lt recovery
10	Housewife	F	50	18
11	,,	F	51	16
12		F	50	13
13	Porter	M	34	Failure
14	Sailor	M	22	14

GROUP 2. HEALED IN PLASTER WITHOUT REDUCTION

Case	Occupation	Sex	Age	Fit for work in (weeks)
15	Retired	M	74	16
16	Coach builder	M	61	16
17	Retired	M	72	12
18	Motor-driver	M	43	14
19	Retired	M	69	14
20	Window cleaner	M	43	18
21	,,	M	33	16
22	Fitter	M	58	Bilateral failure ‡
23	Housewife	F	67	16

* Light work only.
† Associated fracture of 2nd lumbar vertebra; foot satisfactory after 12 weeks.
‡ Severe crush.
§ Mild fissured fracture.

Practical experience has convinced me that Pringle's advice was sound. Good results (in 14 cases summarised in group 1 of the accompanying table) have been obtained by the method of treatment which is described below. For convenience the description is written in the imperative.

When first called to the patient examine him carefully. The injured heel is bruised and tender. Estimate the degree of broadening between finger and thumb, then turn to the opposite foot. In a fall from a height, the os calcis on both sides may be fractured, and if the fracture on one side is of a minor type it may be overshadowed by the more obvious damage on the other side and so missed for a time, unless borne in mind and sought out. If there is any tenderness on deep pressure over the "normal" os calcis, order a radiogram of this bone also, to exclude fracture. Next examine the lumbar spine. At the end of a long fall the jar of the impact may be sufficient to cause a compression fracture of one or more lumbar vertebræ. According to Hermann in 10% of cases of fracture of the os calcis there is an associated crush fracture of the lumbar spine; for this reason he recommends routine X-ray examination of the lumbar spine in all cases of fracture of the os calcis.

When the radiograms of the injured foot have been developed, examine particularly the axial view. If from this in conjunction with the clinical examination which has already been performed, it appears that the bone is appreciably broadened, reduce the lateral spread by compression with a hand clamp. This operation is performed under anæsthesia; it is not often necessary. Elevate the injured foot on a pillow and during the first 24–48 hours apply a cold compress. Lotio plumbi cum opio does very well. If there is severe pain, control it with suitable analgesics. Confine the patient to bed until the bone has become consolidated; weight-bearing must be rigidly forbidden. The patient may sit out of bed in a chair, but if he does so the injured leg must be supported on an adjustable rest. If the leg is allowed to hang down intractable swelling of the foot and ankle will occur. For this reason, walking about with crutches swinging the injured leg, must be forbidden. Consolidation will not take place until 2 or 3 months have passed. During this period of waiting the affected limb is massaged every day and movements of the foot and ankle, both active and passive, are practised, particular attention being paid to the subastragaloid joint. In this way swelling is controlled, the metabolism of the limb is assisted, and stiffness of the foot is minimised.

Allow the patient to begin weight-bearing when consolidation has occurred. The appropriate time must be judged by clinical examination. In this respect radiographic appearances are of no value. Consolidation is sufficiently advanced when the bone ceases to be tender on deep pressure. Before the patient begins to walk apply an 'Elastoplast' bandage from the roots of the toes up to the tibial tubercle, in order to prevent swelling when the erect posture is resumed. Encourage the patient to walk as much as possible and continue the daily systematic exercising of the tarsal joints.

No claims are made for this conservative method of treatment. It will be seen that remodelling of the subastragaloid joint is not attempted, and that the penalties which attend deformity of a weight-bearing articular surface are accepted. The justification for this attitude lies in the fact that attempts at reduction, while failing in their object, aggravate the noxious effects of the fracture. The simple method of treatment recommended yields a foot which if not absolutely painless is at least comfortable. The texture of the tarsal bones quickly returns to normal; the mobility of the foot is in a large measure retained; and the danger of sepsis is avoided.

It is not always possible to keep the patient at rest in hospital until consolidation of the bone has occurred; shortage of beds may make it necessary to treat him as an outpatient. For this reason many surgeons adopt as their routine treatment immobilisation in a plaster cast for 2–3 months; weight-bearing is allowed after a few days when the acute pain subsides. My experience of this method in 9 cases is summarised in group 2 of the table. Eastwood (1938) reports successful results from this treatment. He records the interesting observation of an insurance official that the period of disability after a fracture of the os calcis is increased by surgical treatment, and that those cases do best which are treated at home by the private doctor with embrocation and liniment, whereas cases treated in hospital and operated on do badly.

SUMMARY

The modern method of treating crush fractures of the os calcis consists in reduction by traction and compression, followed by long immobilisation in plaster. The articular facets for the astragalus cannot be completely and accurately restored by this or by any other method; in addition this method of treatment promotes passed subsequently would be "clear" Reversely "clear" tests could be converted to "thick" by giving milk, as had been noted by Barney and Sulkowitch, and Albright We concluded that Sulkowitch's test for urinary calcium has only a very limited use in a nutrition survey

We wish to thank Prof J F Brock for his help and for permitting this work to be done in the Cape Nutrition Survey, and Mr L J Duncan for his technical assistance

REFERENCES

Albright, F (1939) *J Amer med Ass* 112 2592
Barney J D and Sulkowitch H W (1937) *J Urol* 37 746
Bodansky A (1932–33) *J biol Chem* 99, 197, (1933) *Ibid* 101 93
Clark, E P and Collip J B (1925) *Ibid* 63 461
Fisher, R A (1938) Statistical Methods for Research Workers London p 177
Tippett, L H C (1931) Methods of Statistics London p 80

CRUSH FRACTURES OF THE OS CALCIS

CHARLES H GRAY, M B MANC, F R C S
ASSISTANT ORTHOPAEDIC SURGEON TO THE ROYAL INFIRMARY

MODERN fracture treatment is based on the following principles Accurate reduction Enforced uninterrupted immobilisation prolonged until union is complete The greatest possible functional use of the injured part and indeed of the whole body during the period of immobilisation and in the ensuing phase of rehabilitation Improvement has followed the widespread acceptance and practice of these principles There are exceptions, however, in which, for one reason or another, it is better to follow a different plan—for instance, reduction is sometimes impossible or may be achieved only by processes which in the end lead to serious loss of function Such considerations arise in the treatment of crush fractures of the os calcis

These fractures present a difficult problem, the injured bone is squashed and becomes both flattened and broadened In addition, the subastragaloid articulation is disturbed, because the articular surface for the astragalus is fragmented and deformed Sometimes the altered shape of the os calcis causes a subluxation of the mid-tarsal joint The scale of the deformity may be estimated in the lateral radiogram by measuring the salient angle of the bone This is the acute angle made by the intersection of two lines, drawn from the posterior lip of the facet for the astragalus to the anterior angle of the bone, and to the highest point of the tuberosity In a normal bone, this angle is between 20° and 40°, being an index of the upward convexity of the bone After a crush fracture it is always reduced, often to only a few degrees, and sometimes to a negative reading when the bone has been crushed into an upward concavity In the anteroposterior radiogram the body of the bone is seen to be broadened, and the contour of the subastragaloid joint is deformed

It is obvious that reduction of these complex and intricate displacements will always be difficult, and because the bone is small and irregular in shape the maintenance of reduction will not be easy Bohler has supplied an ingenious mechanical solution of these technical problems He restores the upward convexity of the bone by screw traction applied to a pin inserted through the posterior mass of the os calcis, and the lateral broadening of the bone is obliterated with a hand clamp like a little vice The ensuing reduction is maintained by the application of a plaster cast which incorporates not only the pin through the os calcis but also another pin, impaling the tibia just above the ankle-joint This apparatus is retained for a period of 10–14 weeks, when union is judged to have occurred

In my experience this method of treatment, although capable of producing satisfactory radiographical appearances, yields poor functional results, and since the fractured os calcis has such a sinister reputation it is probable that others have been equally unfortunate It is not surprising that the practical outcome of mechanical reduction should be indifferent In fact, this is a surgical problem of such difficulty that no method of treatment would give perfect results, but it is possible to find theoretical reasons for supposing that the modern system of formal mechanical reduction, followed by long immobilisation, is likely to be ineffective and sometimes harmful, and conversely, on practical grounds at any rate, to advocate older and more passive methods of treatment That is the object of this paper

OBJECTIONS TO MODERN METHOD OF TREATMENT

Practical experience, or the illustrations in textbooks will demonstrate the ease with which a skilled operator can, by the use of skeletal traction, secure what appears on radiographical examination to be a good reduction of a crush fracture of the os calcis, the salient angle being restored The radiographic appearances, however, may be fallacious because they direct attention to the gross outline of the bone but are unable to reveal intimately the state of the articular cartilage of the facet for the astragalus In this sense the salient angle is not a true index of successful reduction The functional issue in any particular case will turn to some extent on the final state of the articulations in which the os calcis participates The mid-tarsal joint may escape serious injury but the articular cartilage of the subastragaloid joint is always fissured and its contours deformed Extreme disruption is common After reduction the fissures remain and the complex articular surface is not accurately restored to its normal shape and direction In addition, the violence of the crushing may deprive some areas of their vitality, so that portions of the cartilage slough Probably treatment can never be completely successful as far as the subastragaloid joint is concerned Conn (1935) had reason to expose the subastragaloid joint in several cases which had been treated meticulously by skeletal traction and compression to secure reduction In each of them he found that the joint surfaces were rough and deformed

It may be supposed that the modern method of treatment (by traction and compression and subsequent immobilisation) must fail in an essential respect Does it do any harm? I believe that it does in three ways by introducing the risk of sepsis, by promoting stiffness of the foot, and by encouraging "compensation neurosis"

Sepsis—The transfixion pin in the posterior part of the os calcis lies in a vulnerable area Operation wounds on the outer side of the foot, inflicted on tissues which have not previously been traumatised, are often slow to heal and become superficially infected This tendency to infection is exaggerated by the heavy bruising which accompanies a fracture of the os calcis Hermann (1937) reports that 10% of the cases of fracture of the os calcis in which transfixion pins are used become infected If sepsis does occur, it leads to the formation of persistent sinuses in the skin and soft parts, and to low grade osteomyelitis of the os calcis itself These conditions become chronic and are very difficult to cure

Stiffness—After removal of the plaster it will be found that the foot is stiff and painful The stiffness, which is persistent, affects particularly the subastragaloid joint and proves a serious handicap when walking over uneven surfaces, because the subastragaloid joint normally provides some of the play by which the foot adapts itself to irregularities of the ground In many cases the development of traumatic osteo-arthritis in the joint contributes to the disability The pain is caused partly by strains imposed on the stiffened joints and partly by tenderness of the soft tissues of the heel These have a brawny feel and quite light pressure on the inferior and lateral surfaces of the heel is often sufficient to cause pain X-ray examination of the affected foot will show an extraordinary degree of decalcification, affecting not only the os calcis but all the bones of the foot This change is partly attributable to disuse, but may be analogous to the osteodystrophy which occurs in association with other types of injury It must be emphasised that the pain, stiffness and decalcification persist The patient is disabled and fails to obtain relief from physiotherapy Injections of saline, procaine and 'Proctocaine' (A&H) produce no improvement and may even make the pain much worse for several days after the injection Arthrodesis of the subastragaloid joint is sometimes performed, and as a rule the results of the operation are not satisfactory In some cases amputation is performed as a last resort and after this it is not uncommon to find the patient complaining of a painful phantom foot

THE LANCET

LONDON. SATURDAY, JANUARY 24, 1942

WANTED A TUBERCULOSIS POLICY *

MANY medical problems must be left for a decision ntil the end of the war, either the material facts are ot now available or they must be used in the light f post-war conditions which we can hardly even guess t But tuberculosis is an exception We know nore about it than we do about any three or four ther diseases If we fail to act it is not our knowledge ut our application of it that is at fault Nor can the olution be left for a year or two with impunity The ains which our official mentors are at to explain way the Registrar-General's figures reveal rather han conceal their anxiety that tubercle will get away with it in this war as it has done in every other The first thing is to be frank about the danger The public will only agree to pay for, accept and submit to a policy which they feel is an investment against their own conception of the fearsomeness of a particular disease They have been taught that tuberculosis is preventable that its early detection is simple, that treatment instituted in good time leads to arrest and recovery, that sanatorium treatment is available for all who may be unfortunate enough to become affected, and that a stay of a few months in delightful country surroundings will ensure an early return to home and duty There is scarcely one of these teachings true in the strict sense for it is impossible to prevent infection in the community as a whole (it has been argued, in fact, that minor degrees of infection may actually be beneficial), the early detection of the disease is one of the most formidable problems confronting doctors treatment cannot be instituted in good time for the great majority of cases because the lesions are relatively advanced when they are first detected, and if we could detect all cases there would be a lamentable shortage of beds for their treatment, assuming they would enter institutions at all The slogan of 1911 that three months in the open air was the passport to pulmonary security is a will-o'-the-wisp

This may sound to some like dialectic, an unsympathetic thought-process reflecting too hastily the underlying world-process It needs to be said, but it should not lead to despair or inertia The results so far achieved may not have been commensurate with the "new hope" which TRUDEAU proclaimed at the beginning of the century, but no-one can walk around colonies like Saranac or Papworth without becoming aware that infection with the tubercle bacillus in a good environment is not necessarily prejudicial to health Here is the ideal conception, the very paradigm, of the problem of seed and soil Here are object lessons in combining all the beneficial factors in infection and environment Apply these principles by and large and the problem is solved Of course these institutions cannot be multiplied indefinitely, but the lessons they teach are capable of much wider application than they have hitherto received Let us turn for a moment to some recent epidemiological surveys and consider in broad terms what has come out of them BUSHNELL CUMMINS and others, attempting to explain the incidence of the disease in different countries, have shown that where tuberculosis is common, as in England, the disease assumes the chronic and relatively benign type, where, on the other hand, the disease is rare the cases that do occur are as a rule rapidly fatal Certain individuals and communities are much more resistant to tuberculosis than others of the same race BRADBURY (Lancs) and EDWARDS (New York) have taken special districts and tried to determine the responsibility for the higher attack-rate in certain groups of the population, but they have found it impossible to isolate the various factors included under the term 'environment" and to allocate to each factor its proper rôle in the spread of the disease Some would even dispute BRADBURY'S conclusion that the Irish of Tyneside are a specially susceptible group It is true that certain towns like Manchester, Liverpool and Cardiff, which have had a consistently high tuberculosis mortality-rate, have large congregations of Irish in their populations, but as PICKEN has pointed out, Glasgow seems to provide an exception to the rule In a third type of survey a selected group of the population has been investigated, as at Saranac Lake, in some of the Welsh inquiries, and at Preston Hall in Kent To these belongs BARDSWELL'S discovery that in Cyprus, where poverty bad housing, overcrowding, malnutrition and other bad environmental factors coexist tuberculosis need not assume serious proportions so long as massive infection is controlled Per contra experience at Saranac and Preston Hall shows that in communities where large numbers of open cases are congregated but where there is no poverty, no bad housing, no overcrowding, no malnutrition—but where close watch is kept on families as a whole—healthy individuals nearly all escape

The lesson is this Infection and environment must be considered together and not separately as we have been wont to do Infection is itself an environmental factor Germs may lurk in dark damp places, but the darkest and dampest is the cavity in the lung which remains uncontrolled or uncollapsed, and all the public-health measures in the world will not sanitate these, the most important source of infection Infection being present, other environmental factors must be brought up to a specified standard if massive infection is to be avoided In our own world at the moment tuberculosis must be prevented, not by entire elimination of the infecting agent but by reducing its degree of infectivity We know what the tubercle bacillus does in the unfavourable environmental conditions of Wales and among the homeless and non-settled males of New York City Let our own public-health service set itself to search out the sources of infection, many of them completely unknown and eradicate them, not waiting for the interplay of other environmental factors which sooner or later will lead to the spread of disease This is what Prof E S GODFREY jun, of New York, calls 'shoe-leather' epidemiology to distinguish it from the "swivel-chair" epidemiology based on card-indexing mixed groups of the population It may involve, as he remarks, going out on the highways, byways and alleys, walking the streets stiffness of the foot, incurs the risk of sepsis, and encourages compensation neurosis

---

* This article has been prompted by a monograph to be published in the near future for which Dr F R G HEAF Dr G LISSANT COX Dr D A. POWELL and Dr J B MCDOUGALL accept responsibility

Conservative treatment leaves a comfortable and mobile foot and avoids the danger of sepsis Lateral spread, if considerable, is reduced with a hand clamp, otherwise no attempt at reduction is made The patient is confined to bed, weight-bearing being forbidden but early function encouraged, until the disappearance of deep tenderness shows that adequate consolidation has taken place This takes 2–3 months Alternatively the foot is immobilised for the same period in a plaster cast

These methods were successful in 20 out of 23 cases

REFERENCES

Conn, H R (1935) *J Bone Jt Surg* 17 392
Eastwood, W J (1938) *Brit J Surg* 25, 636
Henderson, M S (1930) *Surg Gynec Obstet* 63 782
Hermann, O J (1937) *J Bone Jt Surg* 19 709
Pringle, J (1910) Fractures and their Treatment London
Yoerg, O W (1937) *Surgery*, 2, 493

Reviews of Books

New Facts on Mental Disorders

NEIL A DAYTON, M D, M C, director of the divisions of statistics and mental deficiency, Massachusetts State Department of Mental Health London Baillière, Tindall and Cox Pp 486 25*s*

THE annual report of Dr Dayton's department has cast its beam far in a world where mental hospital statistics and official reports are mostly jejune, archaic, marrowless tributes to custom Its 278 tables have provided statistical material, not otherwise available, on many points of clinical and social importance He has now published an elaborate survey of all admissions to mental hospitals in Massachusetts between 1917 and 1933 This work of collection and analysis has been going on, with Rockefeller support, since 1928 and has occupied as many as 24 field investigators at one time A concise statement of the conclusions reached heads every chapter, 84 tables and 110 graphs give the statistical evidence on which the conclusions are based, and the commentary in the text is always to the point The main topics are the relationship of age, place of birth, alcohol and marital state to mental disorder, and problems of diagnosis and changing incidence This list, however, gives little notion of the wide range of social factors examined, thus in the opening chapter economic changes are discussed in their bearing on the incidence-rate of insanity, and a remarkable year-to-year agreement is demonstrated between the increasing admission-rate and the decreasing numbers of employed persons between 1923 and 1929, thus the observed increases in mental disorder are shown to have come before the financial depression of 1930 to 1933, not during it For investigators of the social aspect of mental disorder the information in this book is a gold mine

Instruments, Appliances and Theatre Technique

EVELYN PEARCE, S R N, senior sister tutor at the Middlesex Hospital London Faber and Faber Pp 226 6*s*

Miss Pearce, with her expert knowledge, has provided answers to some questions which puzzle the probationer nurse, and even cause those who have passed their professional examinations to stop and think Primarily intended for the instruction of nurses in theatre technique, this little volume also describes clearly the apparatus and technique for modern oxygen therapy, blood-transfusion, instrumental artificial respiration and the irrigation of wounds and burns The earlier chapters deal with operating theatre technique, and in later chapters lists are provided of the instruments required for most of the commoner surgical operations Many excellent photographs make it easy to identify these instruments The handling and sterilisation of delicate and complicated appliances is well described The suggested plan of an operating theatre unit on p 1 is not perhaps ideal The relative positions of sluice and sterilising rooms would entail an unnecessary amount of traffic and the transport of bowls and instruments through the theatre, this is avoided where the two rooms are built next each other The anæsthetic rooms, too, are so placed in the plan that the anæsthetised patient would have to be wheeled through two sets of doors and along what looks like a draughty corridor

School Health Services

W FRANK WALKER, Dr Ph, and CAROLINA R RANDOLPH London Humphrey Milford, Oxford University Press Pp 172 8*s* 6*d*

TAKING six counties in Tennessee as a just section, Walker and Randolph, on behalf of the state department of public health of Tennessee and of the Commonwealth Fund, carried out an investigation into the development and present condition of the school medical service to estimate its efficiency as judged by its results and to discover its trends with a view to their direction Like most American work of this kind, it was carried out in a searching and judicial manner and, allowing for differences in national procedures and customs, is a fair pattern for the evaluation of the school medical service in any country In Tennessee, as throughout the United States, the trend is against routine inspection at fixed intervals

Human Cross Section Anatomy

DUDLEY J MORTON, M D, associate professor of anatomy, RAYMOND C TRUEX, M S, instructor of anatomy, and CARL E KELLNER, departmental artist, all from the College of Physicians and Surgeons, Columbia University, New York London Baillière, Tindall and Cox Pp 250 90 cross sections 33*s*

IN learning anatomy much depends on the visual imagination of the dissector Some people think readily in three dimensions, so that straightforward dissection, the laying back of planes, gives them a good working idea of the solid body Others are preoccupied by surfaces, and to see things in the flat calls up no mental picture of what it looks like in the round For those in the second group cross-sections are necessary to the understanding of anatomy, and for the first group cross sections offer a rapid means of revision The first atlas of sectional anatomy was that of W Braune, published in 1877, and since his day most anatomy textbooks have included transverse sections to illustrate special points like the relations of the lesser omental sac or the distribution of structures at the wrist-joint Now a handsome development of the principle has come from America The hands required to lift this manual—which measures 15 by 12½ in and weighs nearly 7 lb—must be sturdy and should be clean, for inside are almost tactlessly liberal expanses of thick white paper some of which are inscribed with diagrams of human cross sections but many of which are virgin The diagrams are intended for use with coloured lantern slides made from photographs of wax models impressed directly from cross sections During the showing of the slides the students are expected to make notes and sketches on the blank pages Later, after a second showing, they will transfer their notes to the official diagrams, which give only the framework of bones and muscles but not arteries, nerves or veins Having marked in their notes in pencil, the students are advised to outline them in ink and colour the whole picture realistically with special paints "When the course is finished each student should have a complete cross-section atlas of his own making" There should be no difficulty about luring the student into spending hours with this delightful picture-book The question is, what will his physiology teachers be saying in the meantime?

Letters to Margaret

A Simple Introduction to Psychology THEODORE FAITHFULL formerly principal of the Priory Gate School London Allen and Unwin Pp 160 5*s*

WHEN doctors inveigh against the non-medical psychotherapist it is such quarter-baked teachings as these that they have in mind The book is a viscous mixture of dilute psycho-analysis and stale philosophy There is a lot about the subjective and objective forms of love, and about "the sixth sense or the intuition" The style and flavour of the book may be recognised in such a sentence as "the ordinary run of homosexual can normalise himself or herself by clearing up his fixations, probably with greater ease if he secures temporary aid from an endocrinologist" This optimistic generalisation, linking bad psychology with bad physiology, would be a typical extract if it were not that it happens to omit any of the benevolent, semi mystical flummery that abounds in [illegible] ook

Liver extract can of course, be avoided altogether by giving one of the desiccated stomach preparations by mouth. Some patients prefer this method of treatment; others detest it. But stomach preparations are on the whole less plentiful than liver, and this is not surprising since one ox liver made into intramuscular liver extract goes much further than one pig's stomach; moreover the Government's order has led to a rush on existing stocks. Since it is important that treatment should be steadily maintained liver has to be relied on to fill the gap, and it remains the mainstay of war-time treatment of pernicious and allied anæmias.

WHITE OR BUFF?

"We have passed that way before"

WHOLEMEAL bread with 80–90% of the wheat grain tilised was introduced by the Ministry of Food during he war of 1914–18 as a result of the pressure of ubmarine piracy. Necessity dictated the measure, but the Controller's scientific advisers were able to assure him of the advantages the public would gain from wholemeal extraction and an official statement was issued to the following effect:

> "We have become accustomed to eat bread made from the inner two-thirds of the wheat grain, the outer third having been given to animals. But at the present time it is important to use as much as possible of the grain for human food, so that wheat flour is ground to contain four-fifths or more of the whole grain. This is an advantage, not only because we get more food, but because the part of the grain which was formerly rejected contains valuable flesh-forming material and salts."

The experimental work on which this statement was based demonstrated for all time the superiority of wholemeal over white flour, although war bread as actually purveyed to the public was not always nice. This was not entirely the baker's fault, for the wheat was diluted with varying quantities of other cereals and since he was not told the exact composition of the flour he had to do the best he could by rule of thumb. As the war went on longer than was expected there was time for him to gain proficiency and few complaints were heard in 1918. But immediately after the armistice the Food Controller announced the Cabinet's decision to allow a relaxation in the percentage extraction of the wheat grain in order to release offals for animal stock. The reactionary section of the public then discarded with a sigh of relief the good husks of which it felt the pigs had too long been deprived and the rest of the public returned willynilly to the old over-refined flour. Meanwhile one myth had been exploded. Young people of the educated classes had been found innocent of any preference for white bread. But dietetic common sense which had triumphed in 1918 over old-established custom was overruled by economic necessity, and when that necessity passed white bread had become once more the neutral background of daily life which everyone accepts without question. When we are at peace bread is just bread.

Now that we are 28 months into the second world war bread has again become a matter for columnists and gossips. But this time with a difference. The Government have so far left us free to choose between white and wholemeal, or may we say more simply between white and buff, with the result that far more people are thinking about what is involved in the choice. That is all to the good because it may lead to the growth of a health consciousness which will outlast the repressions of the moment. The present-day advisers of the Ministry of Food are telling him what their predecessors told the earlier minister, even if they can now express the valuable flesh-forming material of the wheat germ in terms of riboflavin and nicotinic acid and can point to such a convincing analogy as the Lister Institute has provided. Chick's rats have the same symbolic value as Topley's mice. Dr CHICK fed half a litter of Norwegian pied rats on a basic diet to which straight-run white flour and vitamin B_1 were added, the other half on the same diet plus wholemeal flour. The rats receiving the wholemeal put on weight twice as fast as their opposite numbers and when the diets were exchanged the performances were similarly exchanged. Dr CHICK's conclusion that wholemeal promotes growth in the young rodent has been criticised because the rats preferred it to white flour and ate more. But unquestionably they throve on it and for the human analogy this was the crux. And there is no reason to doubt that the children who need these accessory foods for their growth will also benefit from them for their maintenance when they are past growing. Against the official statement of 1918 can be put the official recommendation of 1940:

> "Flour for the bread of the people should contain the germ of the wheat grain, as much as possible of the aleurone layer, and the finer portions of the bran. Instead of flour consisting of about 70% of the wheat grain as it does at present, the percentage extracted should be at least 80 to 85%."

How is this knowledge to be got through to the bread eater so that he may not only read but inwardly digest it? The Minister of Food regards it as an important subject in his advice service to housewives but his parliamentary secretary told us a week or two ago that there are periods during which there is advertisement space for no more than occasional mention of wheatmeal. And this is not the way in which health crusades are won. Mrs EWING has told us of the Khoja ("a religious teacher and sometimes a schoolmaster also") who once upon a time was always seeking an excuse to shorten or omit his sermons. "Ah, Believers! What shall I say to you?" and when they answered "Some of us know, but some of us do not know" he smiled benevolently and preparing to take his departure "How nice!" said he, "then those of you who know can explain it all to those who do not know." That is Lord HORDER's parting word to doctors. "By our advice," he tells us, "we control the diet in voluntary and municipal hospitals, in convalescent and nurses' homes, in many other institutions and in some 40 000 private houses. If a census of all these showed that wheatmeal is eaten in them exclusively, a few invalids excepted, we should have gone far towards breaking the present white bread habit on the part of the public." Dr and Mrs Dose between them can do the trick, and they can do it wholeheartedly, knowing that this is no passing fad, but a dietetic fact firmly established in the last war and as unquestionably confirmed in this. Then the 7% of National Wheatmeal eaters—and it is doubtful if there are as many as that—should soon creep up to the 25% of the population which Lord WOOLTON would like to see.

and climbing the stairs, or bumping over country roads in order to ferret out the sources of infection Perhaps we are too prone to be satisfied with lining up contacts of known cases When a source of infection has been found, any environmental conditions which are unsatisfactory must be improved or the case must be removed

Finally, there is no logic in widening our range for the detection of new cases if we are not prepared to provide facilities for dealing with them when they are discovered No brief has been made out for the wholesale segregation of open cases, there is no justification for the statement that improved housing conditions in themselves will contribute materially to the reduction of the tuberculosis death-rate, as McGonigle has shown in Stockton-on-Tees There is in fact no proof that any single environmental factor—not even infection under good environmental conditions—will increase the attack-rate from tuberculosis But there is proof that by raising the standard of environment in the presence of infection or alternatively of removing sources of massive infection from bad environment we have the surest method of limiting the spread of infection and therefore of reducing the morbidity So long as tuberculosis remains a clinical entity we may not slacken any effort to bring relief to the individual patient But the time has come to take much more active steps in the preventive field We have been attending to casualties without dealing with the human factories which create these casualties Mass radiology will help us to detect them Until public opinion empowers us to investigate by clinical, radiological, statistical or any other means the nests of infection which keep up the death-rate and maintain the morbidity from tuberculosis we shall not obtain the results we desire and which our enthusiasm deserves

HUSBANDING OUR LIVER EXTRACTS

In order to economise in liver extracts for the treatment of anæmia the Government have decided that only those for injection are to be manufactured, oral preparations are not now made and when present stocks are exhausted there will be no more This was a sound decision, since the oral route is a wasteful and expensive way of giving liver for anæmia But the restriction does not mean that there will be an unlimited supply of parenteral liver preparations—far from it, the intramuscular extracts must be used with the utmost economy, and many practitioners are uncertain how this can best be done

The use of liver extract should be absolutely restricted to patients with pernicious anæmia and the few allied anæmias It is still not clearly understood that "anæmia" is not an indication for liver treatment Various suggestions to the contrary have been made, and are still to be found particularly in commercial literature, but they have never been satisfactorily proved, Whipple's description of a liver-factor potent in secondary anæmia has also not been clinically confirmed With adequate treatment the patient with pernicious anæmia can be as useful a member of society as a controlled diabetic, the inadequately treated patient cannot pull his weight and is liable to the nervous changes recognised as subacute combined degeneration of the cord It is not unreasonable, therefore, to ask that liver extracts should be reserved for those who can certainly benefit from them, and this is made easier by th fact that proper hæmatological examination—which should include sternal puncture if there is any doubt—can be relied on to make the diagnosis of pernicious and allied anæmias sure The practitioner should always have a proper hæmatological examination made in a patient he suspects of having pernicious anæmi and this must be done *before* any treatment is give since such treatment may cover up valuable signs If he is faced with a case of primary anæmia and h does not think the diagnosis is pernicious anæmia, hi best course is to give iron in adequate amounts, an if after a reasonable time (say three weeks) no respons has appeared then his patient requires further an specialised investigation In sum, this means tha liver extracts should be reserved for diagnosed cas of pernicious and allied anæmias How can the live extract be given to these patients so as to get th best use out of it? The usual method is to give sma doses every one or two weeks, in a few mild cas even less frequently, some claim better results b giving a large dose, or a relatively small dose of a ver concentrated preparation, at much longer interval the so called "depot" treatment Seymour, Heml and Miller[2] found that, on aggregate over a peri of several weeks, it took more liver extract to maint a patient in remission by the depot method than b the weekly treatment method In some patient there was little difference in the number of U.S. units or c cm of liver extract required, but in other the depot treatment required about three times a much as the weekly treatment The question o optimum dose is complicated by the absence of an precise method of determining the activity of live extracts This is due to the lack of a reliable anim test for liver potency, the preparations have to b tested under carefully controlled conditions on hum patients, who are hardly ever available in sufficien numbers for statistically significant results to b obtained Nevertheless a system of units is in offici use in the United States,[3] and though the criteria o which these units are based are not very clear, the use has given a guarantee of activity and an indicatio necessarily gross, of the strength of a particul extract And these units are an improvement on th system of stating how much fresh liver tissue w represented in each c cm of extract, since this figu often bears no relation to anti-anæmic potency reliable firms have their liver extracts clinical tested before issue, but these extracts vary in streng —judged by anti-anæmic potency—so that, to ta extremes, a dose of 1 c cm of one brand may roughly equivalent to 5 c cm of another Sometim the adjective 'forte' indicates a concentrat extract, but more often a close perusal of th manufacturer's literature is needed to get any idea the proper dose To give unnecessarily large doses a concentrated preparation is clearly uneconomica to give too little of a dilute one is bad for the patien and our therapeutic authorities should take immedia steps to ensure a standard definition of the type liver extract hidden under trade names, especial now when the doctor's familiar brand may often temporarily unobtainable

---

[1] Israels, M C G *Lancet* 1941 ii 207

[2] Seymour W B, Heinle R W and Miller F R *New Engl Med* 1941 225 673

[3] See *J Amer med Ass* 1938 110 812

ventricle is sufficiently dilated as the calibre of the blood-stream, coming through a normal mitral valve, suddenly widens out a murmur arises Gouley[12] of Philadelphia argues that there must be some good reason why the murmur is not heard in most cases of aortic regurgitation From clinical and post-mortem studies he concludes that the characteristic lesion is a cup shaped deficiency of the inner portion of the right aortic leaflet, so placed as to divert the regurgitated blood towards the lower portion of the anterior mitral curtain which often shows thickening on its ventricular aspect probably due to frictional sclerosis Photographs of these lesions seem to support his contention Of his 10 cases, 8 had cardiovascular syphilis and 2 rheumatic heart disease This significant incidence might explain why one hears more of this murmur in the United States—where cardiovascular syphilis is relatively common among the negro population—than in this country Gouley did not observe a lesion of the posterior aortic cusp in any of his cases and says that in syphilis such an aortic lesion rarely occurs alone The Flint murmur in rheumatic heart disease is rare ecause isolated aortic regurgitation is not often ncountered, except temporarily in children It seems hen that the original observer correctly judged he nature of the phenomenon The Austin Flint murmur is still best interpreted as a result of functional mitral stenosis

CALCIUM AND THE THYROID GLAND

It has been known for many years that thyrotoxicosis s associated with disordered calcium metabolism The excretion of calcium is above normal and considerable decalcification of the skeleton may take place if the disease is active for a long time The converse has also been demonstrated, for in myxœdema the excretion of calcium appears to be below normal under standard onditions of test[13] The cause of the progressive demineralisation of thyrotoxicosis and the route by which the calcium leaves the body have not received he attention they deserve Some investigators have ound increased losses in the fæces,[14] and experiments on rats have suggested that the reason for this is the tendency for the animals to eat more food and have hyperperistalsis The latter part of this theory has never appealed to those who have worked with human subjects, and Robertson[15] has recently put forward another He has demonstrated statistically that the serum calcium in thyrotoxic patients is generally lower han in strictly normal persons, and that it tends to rise after a successful operation Since he has found he urinary output of calcium to be high in thyrotoxicosis and low in myxœdema, he suggests that the excessive loss of calcium is due to a lowering of the renal threshold for calcium This is a plausible suggestion and is in keeping with the fact that the renal threshold for sodium is controlled by the hormones of the suprarenal cortex, and that both vitamin D and the parathyroid hormone have been shown in dogs to raise and lower respectively the threshold for phosphorus[16] The urinary findings on which Robertson bases his theoretical conclusions have yet to be published, so that his work can be linked up with that of others who have found the main channels of calcium excretion in thyrotoxicosis to be the intestine, so far only his figures for total excretion have appeared[17] The generalised decalcification of thyrotoxicosis needs to be borne in mind in treatment Patients who for any reason are not operated on should receive high calcium as well as high calorie diets, and since these patients do not at present qualify for the maximum allowance of milk their diets should be fortified with calcium salts to prevent the decalcification of the skeleton which may otherwise be expected

WEIL-FELIX REACTIONS

In 1916 Weil and Felix[1] found that the sera of patients with exanthematic typhus would specifically agglutinate a variety of proteus, known as X19 The variety which was thus agglutinated contains the somatic antigens of the bacillus and is known as the O strain, in contrast to the H strain which is rich in flagellar antigen The letters O and H were derived from the character of the growth on solid media—the normal flagellated strain of proteus grows in the form of a fine veil or exhalation in German *Hauche*, the non-flagellated variant has small discrete colonies without an exhalation, in German *ohne Hauche* These designations were soon shortened to H and O and H and O they have remained *Proteus OX19* is agglutinated by the sera of patients with both exanthematic and endemic or murine typhus, another variety known as *Proteus OXK* according to Felix and Rhodes[2] probably a variant of *X19*, is agglutinated by the sera of patients with tsutsugamushi disease Any test which is still in use after twenty-five years must be regarded as having fully justified itself Nevertheless even the most specific of tests has certain limitations which must be taken into account if its full value is to be appreciated Nicolle and Comte[3] in 1910 first showed that the sera of patients with typhus often agglutinate *Brucella melitensis* This paraspecific agglutination has recently been studied by Foshay[4] and Calder,[5] who found that agglutinins for proteus, both O and H forms are consistently higher than brucella agglutinins in many patients with chronic brucella infections who give no clinical history of ever having suffered from typhus or Rocky Mountain spotted fever In contrast to the progressively rising titre of proteus agglutinins seen in typhus and Rocky Mountain spotted fever, however, the titre of proteus agglutinins in chronic brucellosis, while often high in a single test, does not subsequently rise as the disease continues It has also been found that the serum of an adult with toxoplasmosis may show agglutinins to *Proteus OX19* in as high a dilution as 1 in 160 Acute toxoplasmosis in adults, recently described by Pinkerton and Henderson,[6] unlike toxoplasmosis in infants, closely resembles typhus and Rocky Mountain spotted fever Like these diseases toxoplasmosis may be transmitted to guineapigs, giving rise to a febrile reaction and to lesions in the brain which are very similar to those seen in typhus Toxoplasms, however, may be found at the point of inoculation Further light on the specificity of the agglutination of *Proteus OXK* has been thrown by certain findings of Savoor and Lewthwaite,[7] who report the curious fact that the sera of rabbits experimentally infected with *Spirillum minus*, the causal organism of rat-bite fever, develop agglutinins for the OXK strain of proteus Moreover, the incidence and the maximal titres attained are much higher than in experimental tsutsugamushi disease in the rabbit though not so high as those elicited by the injection of *Proteus OXK* in the same animal the OX19 strain of proteus is not agglutinated by the sera of rabbits infected with *S minus* Five strains of *S minus*, three of them of human and two of murine origin, produced OXK type agglutinins in 37 out of 38 rabbits while there was no evidence to suggest that the strains of spirillum were contaminated either with proteus bacilli or with the rickettsiæ of tsutsugamushi

---

2 Gouley, B A *Amer Heart J* 1941 22 208
3 Robertson J D *Lancet* 1941 ii, 216
4 Puggley, L I and Anderson L *Biochem J* 1934 24 754 1313 Althausen T L Kerr W J and Stockholm, M *J Clin Invest* 1939 18 763
5 *Nature, Lond* 1941 148 724
6 Harrison H F and Harrison H C *J clin Invest* 1941, 20 47
7 *Lancet*, 1941 ii 129 Beaumont G E, Dodds E C and

[1] Weil E and Felix, A *Wien klin Wschr* 1916 29 33
[2] Felix and Rhodes M *J. Hyg Camb* 1931, 31 225
[3] Nicolle, C and Comte C *Bull Soc Path exot* 1910 3, 214
[4] Foshay L *Amer J clin Path* 1940, 10 176
[5] Calder R M *J Bact* 1941 41, 593
[6] Pinkerton, H and Henderson R G *J Amer med Ass* 1941 116, 807
[7] Savoor, S R and Lewthwaite R *Brit. J exp Path* 1941, 22

Annotations

HIP SYRUP BY THE BOTTLE

National rose hip syrup will be on sale in chemists' shops from Feb 1 onwards This will rejoice our peripatetic correspondents, one of whom in this issue records trouble with the home made brew, while others have been dubious of its vitamin content [1] The official supply is the outcome of a campaign organised last summer and autumn by the Ministry of Health and the Department of Health for Scotland, for the collection of rose hips This brought in 200 tons—the equivalent of 134,000 000 berries—thanks to the activity of scouts guides women's institutes, Scottish women's rural institutes, the W V S and other bodies, and to private pickers These organisations arranged to send their supplies along with those of private pickers, to chosen firms to be made into syrup The country was divided into areas and supplies from each were allotted to various factories, 9 firms undertook to make the syrup and 2s was paid to the pickers for every 14 lb of hips Hip picking is no sinecure, but Scotland set the pace and an Edinburgh factory soon found itself with a surplus The overflow was diverted to English firms and the Scots were invited to stop picking in a broadcast appeal Means were found to eliminate the hairs in the berries and 600,000 bottles of the syrup will be available next month Syrup made under the official scheme will be labelled as conforming to the standards of the Ministry of Health, and it will be available in 6 oz and 8 oz bottles at 1s 9d and 2s 4d It is estimated that a teaspoonful a day will supply half the vitamin C needs of a child Blackcurrant syrup can be made containing 70 mg of vitamin C per 100 g, but official hip syrup contains 200 mg Plans are already being made for repeating this venture next year, and we may even see hip syrup competing with orange juice after the war A hundred years ago hip jam was a commonplace of the doctor's dispensary Mrs Gaskell, writing in 1864, makes her surgeon say of his apprentice "And he'll have the run of the pomfret cakes, and the conserve of hips, and on Sundays he shall have a taste of tamarinds to reward him for his weekly labour at pill-making" The doctor's hip conserve was probably made on the lines of the present confectio rosæ caninæ (*BPC*), in which the hips are deprived of their seeds, brayed in a mortar, rubbed through a sieve and mixed with twice their weight of sugar

GLANDULAR FEVER WITH JAUNDICE

The specificity of the Paul-Bunnell test in the diagnosis of glandular fever has now been clearly established, and its widespread use has led to the recognition of the disease in many forms other than the classical picture of a benign illness characterised by sore throat, adenopathy, splenomegaly and a typical blood-picture Bernstein,[2] in a comprehensive review, goes so far as to say that "on a modest scale infectious mononucleosis can be said to resemble syphilis by virtue of its ability to simulate so many other diseases" In the two cases reported in our present issue by Carter and by Gold, jaundice dominated the clinical picture The occasional occurrence of this symptom has been recognised for some years, though it is generally agreed to be rare In some of the reported cases differentiation from simple "catarrhal" jaundice appears to have been based on insufficient evidence—for example, the presence of a few atypical lymphocytes and a doubtfully positive Paul-Bunnell test The leucocytic picture in catarrhal jaundice has, rather surprisingly, not been clearly determined Schilling[3] thought that leucocytosis with neutrophilia was the rule, while others believe that leucopenia with relative lymphocytosis is common[4] It is probable that a few atypical lymphocytes may be found in catarrhal jaundice as in many other infections, and this finding has to be distinguished from that in glandular fever where there is characteristically an absolute and relative lymphocytosis with many atypical forms There seems no reasonable doubt, however about the diagnosis of glandular fever in the cases described by Carter and Gold The cause of the jaundice is not clear Obstruction to the flow of bile by enlarged glands is a common theory but some observers believe that a toxic hepatitis is the more likely explanation It is apparent that glandular fever should be considered in cases which appear to be catarrhal jaundice but which show some unusual feature especially adenopathy or splenomegaly Liver function tests may help to elucidate the mechanism of the jaundice in cases in which the diagnosis is established by a typical blood picture and a definitely positive Paul Bunnell test

THE AUSTIN FLINT MURMUR

When Austin Flint,[6] rounding off a dissertation on cardiac murmurs, mentioned 2 cases of aortic incompetence in which he had heard a rumbling presystolic murmur without finding any mitral valve lesion at autopsy he little realised the controversy he was starting And he would probably have been surprised to hear that his name would go down in the annals of clinical medicine chiefly for that very observation "So long," he wrote, "as signs are determined from fancied analogies and named from these, or after the person who described them, there cannot but be obscurity and confusion" When he described these cases, in 1862, he was professor of medicine at Bellevue Hospital medical college, New York He came of a New England family of physicians the sixth generation of which is now represented by his grandson, professor emeritus of obstetrics at New York University College of Medicine Flint wrote a successful textbook on phthisis, and was among the earliest to stress the importance of changes in pitch of percussion note and respiratory sounds, which Laennec's school had largely neglected He thought the apical presystolic murmur in aortic regurgitation was due to vibration of the mitral curtains in the auriculoventricular blood current He visualised a condition of functional mitral stenosis as a result of the coaptation of the mitral curtains by the rapid reflux of blood into the left ventricle through the incompetent aortic valve Similar views varying in detail, have been put forward since Broadbent[7] thought that the regurgitating stream actually impinged on the anterior mitral curtain, while Guiteras[8] considered that the current which forced the anterior mitral curtain against the auriculoventricular blood stream was not derived directly from the regurgitating stream but was the result of the speedy filling of the ventricle by both streams Da Costa[9] believed that dilatation of the left ventricle was an important factor making the anterior mitral curtain tense and the target of two oppositely directed streams Laubry and Pezzi[10] maintained that the Flint murmur was merely presystolic gallop rhythm which in the presence of a diastolic murmur creates the illusion of a presystolic murmur They pointed out that the Flint murmur is not heard in well compensated cases of aortic regurgitation, but that it accompanies dilatation of the left ventricle when that develops, and disappears under the influence of digitalis White[11] thinks that the murmur appears when the left

---

[1] See *Lancet*, 1941, ii 649
[2] Bernstein, A *Medicine*, 1940, 19, 85
[3] Quoted by De Vries S I *Acta med scand* 1938, 95, 552,
[4] Jones C M and Minot G R *Boston med surg J* 1923, 189 531
[5] Goldhomer S M Sturgis, C C and Bethell, F H *Arch intern Med* 1941, 67, 1177
[6] Flint A *Amer J med Sci* 1862 44, 19
[7] Broadbent W H and Broadbent J F H Heart Disease London, 1900, p 151
[8] Guiteras, J *Med News N Y* 1885 47 533 and *Trans* *Amer Phys* 1887 2, 37
[9] Da Costa J C Physical Diagnosis Philadelphia 1913, p 710
[10] Laubry, C and Pezzi C Les rhythmes de
[11] White, P

Special Articles

TESTING THE MENTAL ABILITY OF ADULTS

J C Raven, M SC LOND

Mechanisation has made it inevitable that recruitment of men for national service should be based on more than a simple medical examination It is necessary to know (1) whether the man, because of mental incompetence, would prove untrainable, useless in the Services, and a danger to himself and others, and (2) what type of service the man is able to render, and what special training he can profitably be given Information of this kind, obtained at the time of recruitment, reduces wastage during training, prevents slow plodding men from becoming discouraged and allays discontent among men of superior mental ability

To determine the nature of the work a man is capable of doing and his capacity to learn to carry out any task he may have to undertake, some form of occupational interview or questionnaire, together with some form of mental test, is needed (Vernon et al 1941) The only occasion when a man can conveniently be tested appears to be at his medical examination, and this time is far from ideal Men arrive at irregular intervals having travelled very different distances and under very different circumstances Even if organisation is perfect and men are quietly gathered into groups and brought into an appropriately equipped room for testing, passing systematically on for medical examination, an atmosphere of unsettled apprehension is bound to persist, and for a psychological examination such an atmosphere is undesirable Even under ideal conditions a mental test records a process which is essentially variable, and if a man arrives for an examination tired, hungry or worried he will not be able to concentrate on a mental test or think as clearly and logically as he would under normal conditions

Any test used must therefore be capable of holding a man's attention in spite of distracting influences, it must be relatively short and interesting (Raven 1936) It must be such that it can be given fairly successfully under conditions which vary considerably, and to groups of widely varying size, and these variations must not seriously alter the reliability of the results obtained Even men who cannot read must be able to see clearly what is required of them Instructions must be reduced to a minimum and the men must be able to record their judgments quickly, clearly, and in such a way that the test can be rapidly and accurately marked so that by the time a man's medical examination is finished the result of the test is known and the causes of any unreliability can be investigated

A STANDARD TEST OF INTELLECT

At the outbreak of war uncertified mentally defective men were able to enter the Services and repeatedly got into difficulties A high incidence of mentally inferior men was characteristic of sick parades, and a test was required which would indicate a man's general mental level

In America mental tests have been widely used (Buros 1940) Those designed to measure general intelligence have tended to fall into two main groups Some psychologists following Binet's methods have favoured verbal tests, and these show high consistency Terman and Merrill (1937) found the vocabulary test to be the most valuable single test in the scale and added that vocabulary remains practically unimpaired to extreme old age But a person's vocabulary tends to remain unimpaired even after the onset of degenerative mental disease and it is characteristic of verbal tests in general that they depend too much on a person's previously acquired scholastic knowledge and too little on his actual mental activity at the time of testing Other psychologists have preferred to use tests of the "performance" type Unfortunately, performance tests at present, tend to have low reliability and a limited range of usefulness, while they involve mental processes about which we still know relatively little Apart from manual dexterity, it is seldom clear what mental ability is really being measured

In Britain the essential difference between "eductive" (creative) mental activity and repetitive mental processes was emphasised by Spearman (1927a and b), and Stephenson (1931) demonstrated the value of perceptually presented tests of eduction One result of their work was that at the outbreak of war tests were available which would indicate the rate and clearness with which a person was able to learn from his immediate experiences In these tests, ability to succeed depends neither on scholastic knowledge nor acquired skill but essentially on eductive mental activity at the time of the test

For example, with progressive matrices (Raven 1938) a person is shown a design with part left out (see figure) From a group of alternatives shown below he is asked to choose the piece which completes it A series of designs follow Each presents a matrix of relations from which it is possible to educe the nature of the missing figure In the Standard Series of Progressive Matrices 1938, 60 problems of this kind are arranged in the form of five sets The initial tests in each set are self evident These are followed by tests of increasing difficulty The order in which the tests are presented provides the necessary training A tested person must work steadily through the series from the beginning to the end, entering on his scoring form the number of the piece he chooses to complete each test The five separate sets of tests ensure that a person has repeated opportunity to grasp what is required while a comparison between a person's actual scores on each of the five sets and those normally expected, provides a means of estimating the probable reliability of the person's score as a whole

Matrix tests had been given before the war both to children and adults and had been shown to be consistent measures of eductive ability (Raven 1939) In 1940, the standardised series of progressive matrices was given experimentally to 3600 unselected militiamen (Raven 1941), the 5% who obtained lowest scores were then examined individually by their command psychiatrist Of these, more than four-fifths were found to be unsuitable for ordinary military training because of their mental inferiority From their test scores alone, they would have been correctly classified as intellectually defective, intellectual defect being defined as a permanent inability to form comparisons and reason by analogy (Raven 1940)

This condition does not necessarily occur in all persons certified as mentally defective but is probably the chief cause of social failure It may even exist in persons who nevertheless make stable social adjustments because they have good repetitive ability Such cases could not be certified as mentally defective but the diagnosis of intellectual defect would be justified, and would have to be taken into account when selecting men for national service A few of the men who obtained lowest scores were found to be emotionally unstable, maladjusted or slow of apprehension, and it was clear that low scores could result from anxiety, misunderstanding, carelessness distraction or deliberate malingering Provided it was realised that these states of mind could influence the score, and that a mental test was not a substitute for a psychiatric examination, matrix tests provided a valuable aid to diagnosis A series of progressive matrices was therefore adopted by Army psychiatrists as a standard clinical test for the estimation of general mental ability

Subsequent test results showed that intellectual defect was one of the chief causes of untrainability, proneness to accidents, and social maladjustment An association was found to exist between mental inferiority and the incidence of diseases such as scabies (Hodgson 1941) It was also found that men who obtained high matrix test scores responded quickly to specialised training, were able to undertake work involving responsibility, and readily obtained promotion In fact, while low test scores were necessarily unreliable (because they arose from a variety of causes) high scores, assuming that the test had been properly administered and copying had not been allowed, could only be obtained by people of adequate intellectual ability

A Progressive Matrices score gave no information whatever about a man's past experience or present knowledge, but showed clearly how far he would be able to profit by a given degree of training, and indicated the probable rate at which he would learn.

MENTAL TEST DATA

The series of matrices first used in the Services was designed to cover as wide a range of mental ability as disease Three men suffering from tabes dorsalis and four rhesus monkeys were infected experimentally with *S minus* Proof of successful infection was given in each case by a positive immobilisation test as described by Ido and others,[8] yet in only one of the men and in two of the monkeys was there a very slight rise in OXK agglutinins, a rise which could not be regarded as positive When in rabbits injected with *S minus* the OXK type agglutinins are adsorbed by *Proteus OXK* organisms the titre of immobilising antibodies remains the same Since the immobilising bodies are the spirillicidal bodies and therefore the "main" or "specific" antibodies the OXK agglutinins of rat bite fever must be considered to be "minor" or "group" antibodies In this connexion it is interesting to recall that Felix[9] in experiments with London rats found O agglutinins of relatively high titres up to 1 in 500 for one or other type of *Proteus X* in the sera of normal tame rats it seems probable that the OXK type of agglutination may have been due to infection of these rats by *S minus*

HOSPITAL MAN-POWER

ACTING on a recommendation of the Shakespeare Committee the Ministry of Health is taking steps to reduce the numbers of medical officers holding A, B2 and B1 posts in civilian hospitals by 10% in the Provinces and 15% in London Mental hospitals are not included, and the reduction will be smaller in teaching hospitals Hospital and Group Officers, in consultation with the authorities concerned will draw up schemes to spread the reduction over groups of hospitals, and the Central Medical War Committee will then inform each hospital what reduction it must make To offset the reduction in staff the Ministry calls for general and clearly defined arrangements for mutual assistance between hospitals Specified officers should be allocated in each hospital for temporary transfer to other hospitals in case of heavy air raids or exceptional outbreaks of sickness The period of transfer would usually be not more than a week Hospitals should arrange for reciprocal reinforcement not only with hospitals in their own locality or even region but for example the peripheral hospitals of Liverpool might arrange to be reinforced by those of Birmingham, or Newcastle by those of Leeds There should be several alternative sources of reinforcement The arrangements should not be restricted to medical staff of any particular grades, and should also apply to nurses The Ministry's circular (No 2553, dated Jan 16) ends with a gentle reminder to hospital authorities that the transfer of medical and nursing staff can be enforced under the Defence Regulations, with the hope that it will only be necessary to resort to these powers in very exceptional cases

LIABILITY TO SILICOSIS

In his account of silicosis in three Stourbridge fireclay miners[10] Deaner pointed out that these workers had been exposed, in the mines, to dust containing free silica, and suggested that they should be eligible for compensation under the provisions made for cases of silicosis This proposal affects the whole industry, and Mr R Brettell, manager of the mine in which the investigations were made, pertinently asks us whether those fireclay miners developing silicosis must be specially susceptible He records that of the men mining in the same seam as Deaner's 3 cases, 2 have worked there for over 50 years, 12 for over 40 years, and 90% for over 20 years, and that they all appear to be sound and up to the average condition for their age, whereas the 2 brothers with silicosis in Deaner's series have a third brother who has never been down a pit but who suffers from chest trouble which often keeps him away from work There is good evidence that some people are more susceptible to silicosis than others The annual report for 1936 of the Chief Medical Inspector of Factories shows that in autopsies done on 189 men exposed to silica risk for an average period of 29½ years mild silicosis was present in only 67, while the remaining 122 showed no sign of it During the same span of time the industries in which these men worked had produced many cases of established silicosis Moreover, it is generally accepted that patients with tuberculosis are particularly liable to develop silicosis if exposed to the risk, and other respiratory conditions such as chronic bronchitis also predispose to the condition It is unfortunately not possible to forecast whether silicosis is going to develop in any given man though the Medical Bureau of Johannesburg has accepted criteria based on Kretschmer's classification of physical types, thus the tall, thin asthenics and the thickset, broadchested pyknics are both thought to be more liable to silicosis than the athletic type, or the small, thin, wiry man who cannot be classified Recent experiments on Welsh miners with pneumoconiosis, however, do not bear out this theory, and among them there is no clear evidence, as we noted not long ago,[11] that bodily measurements give any guide to those susceptible to this hazard Now that it has been established that silicosis does occur among Stourbridge fire clay miners it would be in the interests of men and employers to arrange a clinical and radiological review

HEALTH AS A TOOL

MANY little manuals, in the past ten years or so, have invited people to dedicate their leisure to the supreme task of keeping fit The man who buried his talent in a napkin certainly got no credit for it, but it is doubtful whether he would have won more approval by digging it up daily, giving it a bit of a polish and putting it back In a small pamphlet,[12] written for the Board of Education, Dr Anna Broman is less obsessed with this doctrine of health for health's sake than some She does realise that a girl wants to use part of her health and vigour in dancing, and that she is going to put on high heeled shoes for the purpose, she does admit that a young man may like to drink a glass of beer with his friends, and that it is no less important to him to sit down in slacks and air his views than to run round in shorts and air his lungs In short she recognises health as a useful tool to live with not a mystical entity to live for, and she provides simple directions for looking after the tool It is her bad luck that some of her suggestions are difficult to put into practice just at present That diet rich in dairy produce and fruit has had to give way to some food hints for war time, and her views on ventilation, like those of many other people, are hampered by the blackout She writes sensibly of exercise and fatigue, of sunshine and skyshine of sleep and clothes and cleanliness Her notes are intended for use by youth group leaders, as the basis for short talks to guides, scouts and boys' and girls' clubs When the present 10,000 copies are exhausted, she might try her hand at a more intimate and colloquial approach in a second edition And the printer might try his hand with black ink—more visible in the dusk than brown, and better suited to the dim lamps of war-time

A William Mackenzie medal has been awarded to Dr A Ballantyne, a former professor of ophthalmology at G University, in recognition of his work in the ophthalmological branch of medicine and surgery It is hoped that Ballantyne will give the customary address in May, when section of ophthalmology of the Royal Society of Medicine meeting in Glasgow xample, on admission to hospital, the matrix test score of one man was 50 While he was in hospital his mother died, he was much attached to her and became depressed Seven weeks after admission he was re-tested Instead of showing the usual rise of 2 points his score fell 8 points A normal man would react in a similar way but he would tend to retain control over his depression and it is doubtful if his test score would fall at all

---

[8] Ido Y, Ito, H, Wani, H and Okuda, K *J exp Med* 1917, 26, 377

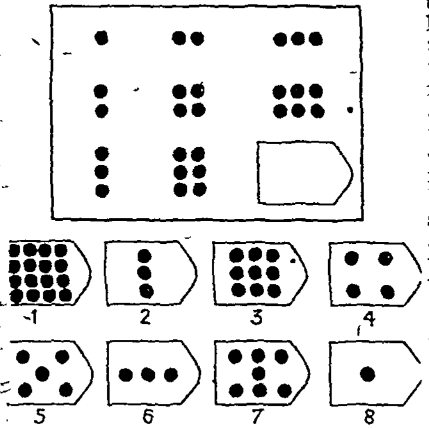
[9] *Trans R Soc trop Med Hyg* 1933, 27, 147

[10] Deaner, S *Lancet*, 1941, ii, 417

[11] *Ibid* p 805

[12] Simple Health Hints H M Stationery Office 3*d*

Since matrix tests are designed to measure mental activity at the time of the test as delicately as possible they are particularly susceptible to variations in the control of mental activity, and in clinical work a test score does not always indicate the true level of a person's mental ability The test thus fails to tell us one of the things we wish to know from it but on the other hand it is clinically useful to know the variability of mental output For this however, an analysis of the results of a ingle test may be insufficient For example, a score of 42 made up of the sub-test scores 11, 7, 5, 9, 10, when normally it should be made up of the sub-test scores 11, 0, 9, 8, 4, is clearly unreliable though the cause is not obvious The man's irregular score may be due to ariability of mental output, to distraction early in the est (which would lower his total score) or to copying at the end (which would make his score higher than it hould be) To estimate the significance of this unreliable core, his score on a completely different type of test is needed Performance tests can sometimes be employed but their range of usefulness is limited and their interpreation complex A vocabulary test is more useful, its ange is wider and it can be highly reliable Also, a person's vocabulary tends to remain relatively constant hroughout adult life and even after the onset of mental disease For these reasons a vocabulary test is a useful omplement to a test of the matrix type



DISCUSSION

The advantages of including a mental test as part of a man's general examination for national service are now generally accepted, but the variability of mental test cores obtained by neurotic persons emphasises the need for caution A mental test records an activity which varies with health, with incentive and with immediate or emote distractions The successful use of mental-test data in practice depends on the clearness with which this is recognised Many factors determine a man's suitability or a particular type of work or degree of mental strain and it would be harmful if classification by any mental est were adopted as a rule-of-thumb method of grading men for national service

On the one hand, a record of the reason why a man is allocated to any kind of work is administratively useful, on the other, success in using mental tests depends on the insight with which a psychologist is able to observe differences of individual response to standard test situations and to interpret their significance For this t is more important to be thoroughly familiar with a few well-chosen tests than to have partial knowledge and asual experience of a large number, and clinical experience suggests that a test such as Progressive Matrices, designed to record a man's ability to learn from his immediate experiences, together with a vocabulary test designed to indicate his general level of intellectual attainment, can give more information about his mental constitution than a single test of general intelligence or a number of performance tests But the ways in which neurotic persons react to mental tests present problems which merit uller investigation with a view to improving the reliability of mental tests and increasing their diagnostic value

I would like to thank Dr F D Turner of the Royal Eastern Counties Institution, and the staff of the Mill Hill Emergency Hospital, especially Dr Aubrey Lewis The work has been carried out under the auspices of the Medical Research Council

BIBLIOGRAPHY

Buros, O (1940) Mental Measurement Year Book, New Jersey
Hodgson, G A (1941) *Lancet* ii 791
Raven, J C (1936) Mental Tests used in Genetic Studies, University of London Library (1938) Progressive Matrices London (1939) *Brit J med Psychol* 18 916, (1940) *Ment Hlth*, 1, 10 (1941) *Brit J med Psychol* 19, 137
Slater, P (1942) *Lancet* i, 101
Spearman C (1927a) The Nature of Intelligence and Principles of Cognition London, (1927b) The Abilities of Man London
Stephenson, W (1931) *Amer J educ Psychol* 22
Terman, L M and Merrill, M A (1937) Measuring Intelligence London
Vernon P E (1940) The Measurement of Abilities London
— Esher, F J S and Trist E L (1941) *Occup Psychol* 15 107

BRITISH ORTHOPÆDIC ASSOCIATION

The annual general meeting of this society took place at Oxford on Jan 1 and 2 under the presidency of Prof T P **McMurray** (Liverpool), who pleaded for a renewal of interest in *non-operative treatment in orthopædic surgery* *The programmes of the association for the last* fifteen years demonstrated the interest every new operation aroused Orthopædic surgeons were in danger of forgetting their descent from men who used less spectacular methods to immobilise joints and restore function This apparent neglect might lead to the growth of a new branch of medicine The modern tendency was to forget that the operation was only an incident—and not necessarily the most important incident—in treatment Professor McMurray went on to give examples where emphasis on operative procedures had in his opinion, caused neglect of orthopædic principles Low backache was correctly treated by applying the mechanical principles of muscular balance and posture but wrongly treated by devising an open operation for each segmental pain Again, when union in fractures of the tibia was delayed there was a tendency to rush to bone-grafting without recalling that since 1867 the principle of chronic venous congestion had been known the principle now revived in the walking calliper Professor McMurray urged caution before deciding on open operations on knee-joints, especially in soldiers, without sufficient evidence of cartilage lesions It was a mistake to ask the patient the direct question "Does your knee lock?" Too often the answer was "Yes," although the question had not been really understood The good results obtained by conservatism in some cases of chronic arthritis should be considered before deciding on operation In tuberculous disease of the spine Professor McMurray thought it had been shown fairly conclusively that conservative methods should hold the field A comprehensive survey of cases in this country had produced no proof that the recovery of any patient was hastened by operation Wherever it was applied he urged that conservative treatment should be given a fair chance It did not imply a patient "kicking about in bed in a convalescent home", but was a definite treatment including fixation and splinting and required a long period of care and skilful supervision

Prof **Philip Wilson** (New York) described the results he had obtained in the *treatment of arthritis of the hip-joint with the vitallium cup* This is a method evolved by Smith-Petersen, in an attempt to re-establish painless movement between the arthritic joint surfaces by interposition of a metallic cup, moulded over the head of the femur Re-operation in some of the cases had shown that the bone surfaces in contact with the cup become covered with a considerable layer of fibrocartilage The method, he considered, contrasted favourably with arthroplasty by interposition of a fascial graft, and was particularly suitable for arthritis following congenital dislocation of the hip, post-traumatic arthritis and some cases of osteo-arthritis It was simpler than fascial grafting, and the postoperative recovery was quieter and less painful He had used the vitallium cup for only three years, and could not express an opinion on long-range results but so far a satisfactory proportion of good and excellent results had been obtained

Mr **Arthur Rocyn-Jones** (London) reported a case of *Paget's disease of a single long bone* in a woman of possible, but before the outbreak of war large-scale investigations had been confined chiefly to work with children, and adults tended to cluster rather closely at the upper extreme of the scale From data collected since the war it has been possible to prepare a revision of the tests expressly for use with adults The underlying principles remain the same, but results as reliable as those originally obtained in about an hour can now be obtained in 20 minutes and the scores for adults are more uniformly distributed throughout the revised scale

Grading men according to their test scores presents difficulty There is no simple ratio between a test score and a person's real mental ability If one man scores 60, a second man scores 30 and a third man 0, to say that the first man has twice the mental ability of the second man would be as absurd as to say that the third man has no mental ability at all simply because his score on the test is 0 It would be equally absurd to suppose that a difference of five marks at the beginning, middle or end of the scale represented equal differences of mental ability Binet's method of measuring mental ability in terms of mental age and intelligence quotient at first sight seems ingenious, but on investigation one finds it impossible to give any definition of what one is really measuring or in what units it is being measured The most satisfactory way of measuring mental ability is to measure it in terms of its distribution amongst people of the same age or age-group, especially when one is concerned with adults

Two methods commend themselves If the ability to be measured is distributed in such a way that test scores form a regular Gaussian or "normal" distribution, the most satisfactory method is to convert test scores into standard scores (Vernon 1940), the statistical properties of which are known There are two disadvantages the lay user is seldom familiar with the technique of handling standard scores, and it must either be demonstrated that the distribution of the original test scores was normal, or—if they were distributed in some other way—it must be assumed that they have been appropriately adjusted, before the standard scores can be calculated The other method (Slater 1942) necessitates no preliminary assumption about the way in which scores are distributed A person's ability can be estimated directly in terms of the frequency with which a similar degree of ability is found to occur in a given sample of people For example, if a man's ability is such that 75% of men of his own age get a score lower than his, his ability can be rated at the 75 percentile level The method has the advantage that it presents the results in a way which has immediate practical use, one knows at once how often a similar degree of ability may be expected to occur among the people for whom scores have been computed The significance of such ratings can be adequately understood by lay users, and they permit of efficient statistical treatment where desired

For general purposes it is convenient to grade people in classes according to whether they may be regarded as

Grade I, superior intellectual ability
Grade II, above average
Grade III, average
Grade IV, below average
Grade V, intellectually defective

Men can be classified in this way either from standard scores or percentile ratings It has practical value but it has the defect that no such classes really exist Mental ability varies imperceptibly, from complete inability to form comparisons or to reason by analogy, to the highest form of creative thought, so that while most people can be classified in this way, there will always be some whose scores fall so near the dividing line between different classes that it is impossible to say to which class they really belong If for practical purposes people must be classified the wisest course is to show alongside the classification the actual score obtained, and to indicate how far this may be regarded as reliable

TEST INTERPRETATION

A test of the type described gives no information about a person's previous experience or present ability to carry out any given type of work, nor is it designed to indicate anything about temperamental disposition Its purpose is simply to show how far, by virtue of innate ability, a man may be expected to succeed, other things bein equal, in any task he undertakes or has to learn Fo example, a test score gives no information about a man's acquired mechanical skill but shows whether he can eve learn to assemble a Bren gun It does not show, whether he is physically and temperamentally suited t drive a tank, but it does indicate whether he apprehends clearly and has accurate judgment

Even when adequate information is available about a man's previous occupation and constitution, as well as a reliable mental test rating, the final judgment abo the type of work for which he is suited has still to b made It is absurd to suppose that any man obtaining a certain score on a mental test is necessarily suited o unsuited for a given type of work, but it has been shown that a given type of work needs, in general, men of a given mental test rating, and that men of a lower cla prove failures even though, by their own statement th were engaged in a similar occupation as civilians

In interpreting the result of a mental test it is usual to assume that the person has done his best The act consistency and reliability of test data justifies th The chief responsibility of whoever conducts the tests is guide people in the method of working and ensure stea individual effort Provided there is no distraction, n copying, and no abnormally great incentive to succeed o fail, normal people give surprisingly consistent scor

People attending psychiatric clinics cannot so safe be assumed to have done their best, 107 men given th matrix test on admission to the Mill Hill Emergen Hospital were re-tested shortly before discharge Th observed consistency of their scores was compared wi that normally expected It was found that norm people gave a standard deviation of 11 in their scores a the first test, and 10 5 at the second test whereas th 107 neurotic patients gave a standard deviation of 10 in their first test and 11 01 in their second test, th correlation for the normal group was 0 88, but the neurotic group 0 76 * It may thus be concl from the figures that neurotic men have less con test scores than normal people Inquiry showed tha these re-tested patients some had resented being te at all on emotional grounds, some, from mental co sion, were unable to grasp even simple instructi while others were distracted by experiences remote f the test situation The chief work of the clinical psych gist is not merely to administer the test but to de discrepancies in test data, to assess their prob significance, and to determine the extent to which given test result can be accepted as reliable In cli work it is particularly necessary to bear in mind th matrix test score is a record of the man's mental act at the time of the test

Matrix test grades of the 107 men on admissio Mill Hill Hospital have been compared with their gr on re-testing after treatment (see table) There w

Grade		Second test					First test totals & %	Expected
		I	II	III	IV	V		
First test	I	3					3 (3)	[illegible]
	II	6	3	5	1		15 (14)	[illegible]
	III	2	10	31	8		51 (48)	[illegible]
	IV		3	7	14	3	27 (25)	
	V			1	4	6	11 (10)	
Second test totals		11	16	44	27	9	107	
Percentage		10	15	42	25	8	100	
Expected percentage		5	20	50	20	5		

general tendency for the men to reach a higher grad re-testing, 6 were two grades higher, but 13 of the were one grade lower on re-testing, 1 man was two gr lower Scores tended to increase by two to three p on re-testing, there was also an association betw recovery of health and rise in test score Copying o first occasion, lack of interest and apathy, in anxiety and depression were the chief causes cont to a fall in score on re-testing

Neurotic patients show unusual variability in output of mental activity for a particular task

---

* These data and those in the table were provided by M Halstead, assistant psychologist at Mill [illegible] Hospi

onsent” Her experience has naturally moved her to protest that there ought to be some definite rule for the nformation of patients

There seems to be no direct legal authority on the point n England We must await some occasion when a patient claims possession of a radiogram from a doctor who refuses to part with it There are, however, certain observations which it is usual to make In the first place here may be no perfect analogy between a patient's right o a radiogram (made for the purpose of expert advice nd treatment) and a sitter's right to copies of a portrait photograph (where the production of copies which will be he property of the person who pays for them is an ssential part of the bargain) The courts decided many years ago that the copyright in a portrait photograph, where the circumstances indicate that the sitter will pay herefor, is in the sitter even though the property in the egative be in the photographer, the photographer may t produce copies from the negative for unauthorised le or exhibition The distinction between negatives d prints made therefrom may be worth noting in nsidering where the ownership of radiograms lies, t the important fact is that the patient undergoes ray examination not in order to obtain an artistic cture for the adornment of somebody's mantelpiece, it in order to obtain expert advice upon a bone-pattern hich is probably meaningless to the layman The rtrait photographer is not going to make any report r the benefit of the sitter's health, nor is diagnosis or ture medical or surgical treatment the object of the sit to the studio The medical profession and the anagement of a hospital treat radiograms as part of the cords of a case In this sense they differ little from mperature charts or the mouth-chart which a dentist reserves, except that probably the patient cannot forget hat an X-ray film is something for which an additional ayment has been demanded There may be some legal gnificance in the question whether the patient has or as not been in independent contractual relationship with he radiologist There is, of course, a special complication where a patient, either by change of residence or therwise, changes his medical attendant, but the originlly employed doctor will presumably make no difficulty ver giving all available information to the new doctor in he ordinary case

If the English courts have not yet given any clear uidance on the legal issue, the American courts have ealt with it in decisions which are usefully discussed in r S W Donaldson's book “The Roentgenologist in ourt” (1937)[1] In the Massachusetts Supreme Court in Whipple *v* Grandchamp (1927) there seems to have been doubt about the admissibility of X-ray pictures of the plaintiff They were admitted, notwithstanding that he radiologist had died before the trial, on identification by the technician who worked in the production of the ilms The court noted that the films were considered to be hospital property, they were not taken save on the order of the physician or surgeon, the radiograms were ndexed and numbered as part of the hospital records n a Michigan case, Hurley Hospital *v* Gage (1931), the patient, in making payment on account, refused to pay he usual charges for the X-ray work unless the radiograms were delivered to him The hospital refused delivery and sued for the balance due The circuit court held that the films should remain with the hospital because the hospital sold, and the patient purchased, knowledge and experience rather than so much celluloid and because the hospital needed to preserve the radiograms for its own protection (presumably in the event of allegations of negligence) A more authoritative decision was that of the Michigan Supreme Court in McGarry *v* J A Mercier Co (1935) The defendants declined to pay for medical services to an injured employee because the doctor had not made frequent reports on the patient's progress and had refused to hand over the X-ray negatives made in the course of the treatment The plaintiff doctor offered to allow other doctors to inspect them if not removed from his possession The judges held that the doctor was justified in refusing to give up the negatives In the absence of agreement to the contrary they were his property and constituted an important part of his clinical ecord of the case as well as embodying information of professional value They differed little from a microscopic slide of tissue made during diagnosis or treatment The court was unimpressed by the fact that the patient (or someone on his behalf) paid a fee for the X-ray work Dr Donaldson indicates that the McGarry case recognises the value to the practitioner, and to the medical profession and indirectly to the public, of all data obtained from patients whether hospital records, cardiac tracings charts or photographs They all go to make up, in the judge's words, information “of value incident to a physician's or surgeon's experience” Their benefit to a teaching hospital is obvious Dr Donaldson cites some interesting extra-judicial opinions in denial of the patient's right to possession of radiograms Dr E H Skinner, writing in “The Modern Hospital” (1913), expressed the view that the patient and the medical attendant were entitled to the radiologist's opinion, “but never to the plates” The American Roentgen Ray Society's committee reported in 1914 that the patient should receive no report except through the referring physician or surgeon, “prints in the hands of patients lead to false interpretation, confusing opinions, multiplicity of advice and bad results” In 1920 the Radiological Society of North America, by a resolution passed at its annual meeting, committed itself to the view that all radiograms, negatives, photographs or other records of X-ray examination were the exclusive property of the radiologist who made them or of the laboratory where they were made More recently[2] the British Institute of Radiology stated that the property of an X-ray negative is in the radiologist by whom, or under whose instructions, or in whose department, the negative is made One can sympathise nevertheless with the complaint of a patient in England that, for want of some clear ruling and uniformity of practice, avoidable doubts and difficulties are allowed to arise

THE FUTURE OF PHARMACY

PHARMACY as practised in Great Britain falls into an intermediate position between the professions and commerce, pharmacists receive a purely scientific education of university standard and when this is over the majority spend the remainder of their lives as retail salesmen with little opportunity of utilising their scientific knowledge This anomalous position has caused considerable dissatisfaction among the calling and a committee of inquiry was set up by the Pharmaceutical Society in 1937 The committee has recently published its final report (*Pharm J* Dec 13, 1941 p 201) which contains recommendations made in the light of probable trends in development

The committee recognises the advantages inherent in multiple-trading and informs the independent pharmacist “that a system of cooperation between independent businesses is essential if their economic position is to be maintained and improved” This cooperation is apparently to be achieved by means of compulsion, and the committee declares itself in favour of a state medical service by advising pharmacists to support the principle that the prevention and treatment of disease should be organised as a public service and to join with other interested bodies and individuals in devising the best form of organisation which would embody this principle The committee would like to see control over both the opening of new pharmacies and the channels of distribution and prices of drugs and medical products, while applications for inclusion in the lists of contractors for supplying N H I medicines should be granted only if there is need for additional facilities for obtaining such medicines in the district concerned These proposals are revolutionary and their fulfilment would imply a fundamental change in the present attitude to private enterprise generally In its advocacy of the exercise of control over the advertising of proprietary medicines the committee will certainly have the support of responsible medical opinion With the passing of the Pharmacy and Medicines Act, 1941, inveterate optimists already see signs of the beginnings of some restriction upon what has become a serious social evil In wholesale and manufacturing pharmacy the committee recommends the avoidance of different trade names for the same medicament, the specialisation upon products of a standard character by selected firms thirty It was the consensus of opinion among those present that healing of fractures in Paget's disease was not at all delayed Mr Rocyn-Jones showed that this was because the bone callus by which union was effected was normal and histologically unchanged by the disease in the adjacent bone-ends

---

[1] See *Lancet*, 1937, ii, 1382

[2] See *Lancet* 1936 i 614

Mr A L **Eyre-Brook** (Bristol) showed a specimen of *recurrent dislocation of the shoulder-joint* obtained from a patient who had died during operation for repair of the disability The specimen showed only one lesion—detachment of the capsule from the anterior lip of the glenoid This is the lesion described by Mr Blundell Bankart[1] which has not received the general support of orthopædic surgeons as the cause of recurrent dislocation, though as Mr Eyre-Brook said ever since the paper appeared there have been a few believers, and their faith had steadily grown with their experience of the lesion The technical difficulty of reattachment of the capsule had, however, discouraged many from performing the operative cure described by Bankart —Professor **Wilson** asked Mr Bankart what he did about the subscapularis The anterior exposure described by him was excellent, but it did seem to involve extensive division of the subscapularis —Mr **Bankart** replied that he felt there was no objection to free division of the muscle Muscle always recovered from cutting so long as the nerve supply was intact In every case in which he operated for recurrent dislocation he found this lesion which was not surprising since it was the cause of recurrent dislocation After trying various methods of reattaching the capsule he had adopted that of drilling the neck of the scapula by means of a dental drill with a right-angled attachment and threading the suture material through the drill-hole

Squadron-Leader J R **Armstrong** R A F V R described his method of treating *fractures of the carpal scaphoid* by drilling and the insertion of bone-grafts Even with prolonged immobilisation in plaster in 20% of old cases and 10% of recent fractures the lesion did not unite In civil life this did not necessarily matter so much but there was a real urgency to get R A F personnel back on duty Drilling and grafting, he found, hastened union, and in every case that he had followed had led to union by bone For radiography and operation he used an oblique position of the forearm maintained by supporting it on a wooden frame in which it lay in 45° of pronation, with the palm upwards and the hand in the mid-position between dorsiflexion and palmar flexion[2] The oblique view of the wrist obtained by radiography in this position was a true lateral of the scaphoid Also the drill could be driven in straight through both fragments of the bone at right angles to the fracture-line A 2 mm guide was first inserted by an electric drill, and a radiogram taken before the bone was bored for the insertion of the graft Grafting was not justifiable in the presence of arthritis of the wrist-joint, because it never relieved the pain which was the main indication for operation in fractured scaphoid

Mr **Geoffrey Hyman** (Leeds) had investigated 67 consecutive cases of *ossification around the elbow-joint* Of these, 45 had followed dislocation of the elbow (32 without fracture, 6 with fracture of the head of the radius, and 7 with multiple fractures) A further 13 cases had followed a tear of ligaments around the joint, demonstrated in the radiogram by the presence of flakes of bone Only one patient was under the age of 10 years, probably because in young children the common injury is supracondylar fracture, and dislocation is rare The age-groups showing most lesions were at 10–20 and 40–50 Delayed reduction, repeated and forcible manipulations and early movement were important factors in causation Ossification in the lateral ligaments, even when it produced a well-marked shadow in the radiogram, did not produce much limitation of movement Full flexion in all these cases had been regained, 20° of extension had been lost in a few cases The significance of a bony mass in front of the joint depended almost entirely on its position If in immediate contact with the anterior part of the capsule it was more serious than if well above the level of the articular surfaces Articular ossification could occur even where treatment had been early and adequate, but adequate treatment did limit the extent of the ossification The method of fixation Mr Hyman used was a posterior plaster splint, maintaining the elbow-joint at an angle of 70° Immobilisation was maintained till flexion was possible without pain, usually about three weeks Results were obtained by this method at least as good as by immobilisation till no further ossification was apparent by X-ray control —Mr H A T **Fairbank** (London) had found immobilisation more effective in the treatment of myositis ossificans in children than in adults

Mr R G **Taylor** (Sheffield) had treated 29 cases of *pelvic dislocation* between October, 1937, and June, 1941, which Prof H J **Seddon** said was the most comprehensive and carefully documented series so far reported Of the 29 cases, 22 were dislocations or subluxation or both of the symphysis pubis and the sacro iliac joint, while 7 were dislocations or subluxations of the symphysis pubis alone Most of the patients were in the second decade The injury occurred by indirect leverage There was no evidence that direct violence was a cause Hyperextension and abduction probably produce the displacement, and reduction was obtained by flexion, adduction and internal rotation All types of operation had been tried, but the conclusion reached was that closed manipulation was to be preferred Rapid reduction was effected within the first hour or two after the accident Improvement in the general symptoms of shock was evident as soon as the displacement was reduced The pelvis was slung with weights pulling the ends of the sling across the body, about 30 lb on each side The legs were extended on Braun splints with about 15 lb pulling on each leg After reduction, immobilisation was maintained for 8–12 weeks Of the 22 cases 3 died (there were often severe concomitant injuries) of the 19 who recovered 16 were walking well and were without pain, 2 were good results but had some pain, and 1 was classed as a fair result only

Mr G K **McKee** (Norwich) showed a film illustrating the *treatment of compound fractures of the leg* The deformity was corrected by means of Steinmann pins inserted into the bone above and below the fracture The upper pin was clamped to the sides of a Thomas splint which supported the limb Manual traction was exerted on the lower pin and the clamp applied when sufficient extension had been obtained During the plastering process, done a few days after the reduction the limb was kept in position on the Thomas splint, and the lower pin was included in the plaster The healing of the wound and the return of function, as shown in the film, were most impressive

At the Wingfield Orthopædic Hospital, Mr J C **Scott** and Sister **Walker** showed cases and radiograms illustrating the stages of *reduction of congenital dislocation of the hip* by gradual traction and increasing abduction on a frame Most satisfactory results are being obtained

Plans for the establishment of a complete accident service for the country were discussed at the business meeting

MEDICINE AND THE LAW

Property in Radiograms

A **patient** writes to ask about her rights in the X-ray photographs taken in the course of professional treatment Her medical attendant, Dr A recommended X-ray examination of her knees this revealed arthritis, radiant heat was successfully applied and she was advised to repeat the treatment periodically Later, having occasion to move to a different part of the country and knowing that she would have to consult a doctor before obtaining further treatment she asked for the films in order to show them to him Dr A's secretary replied that it was not customary or desirable to give patients films, but, if she were consulting a doctor and he desired a report on her X-ray examination, Dr A would be pleased to furnish one The patient, not surprisingly perhaps, fails to understand why the films for which she has paid cannot readily be handed to her and why she is obliged by Dr A's attitude to have two doctors in what is really a simple case She mentions that she knows three cases in which radiograms were sent to patients without their being asked for She herself wrote to the hospital where the X-ray examination had been made The hospital sent her the films next day, but Dr A's secretary, having apparently been informed by the hospital, wrote that this was done "without Dr A's knowledge

---

[1] *Brit J Surg* 1938, 26, 23

[2] See *Lancet* 1941 i, 537

IRELAND

THE TUBERCULOSIS PROBLEM

HERE is a growing public interest in the tuberculosis blem in Ireland It is some months since a special mmittee of the Royal Academy of Medicine submitted the Minister for Local Government and Public Health cheme for dealing with the problem as it affects the y and county of Dublin, and it is understood that the nister has promised to give an interview to repre- tatives of the committee within the next week or At present the provisions for dealing with the ease in the metropolitan area are gravely inadequate ither in equipment nor in number of personnel is tuberculosis dispensary capable of dealing with the mber of tuberculous patients in the city , sanatorium commodation is so limited that patients in need of h treatment have to wait months before gaining mission , for surgical treatment the public authorities almost entirely dependent on the voluntary hospitals ne of which is altogether suitable for treating berculosis Moreover, the increase in the number of tients requiring such treatment has accelerated so much recent years that the admission of other patients is vely hampered, thereby rendering the already serious ortage of beds in the general hospitals more acute he inadequacy of institutional accommodation for berculosis generally has recently been emphasised by e figures in a return prepared by the National Health surance Society dealing with its members who are ceiving sickness or disablement benefit on account of berculosis The figures given do not of course present the total figures for tuberculosis for the country ut they probably offer a fair sample It was found at of 2983 persons receiving benefit for sickness or sablement arising from tuberculosis no less than 2162 72% are living in their own homes The lowest oportion is in county Dublin excluding the city, here the percentage is 50 In many counties the oportion is over 80% and in one 90 To anyone miliar with the conditions of life in working-class mes in Ireland, both in city and country there can no doubt that the presence of so many tuberculous tients in their own homes is a grave danger to the her members of their families It is unfortunate that Ireland, particularly in the rural districts there is a tain social stigma connected with tuberculosis and any patients delay in seeking treatment and have a luctance to enter institutions therefore When to this luctance is added the difficulty of obtaining accom- odation the resulting delay greatly diminishes the ospect of cure

SCOTLAND

HOSPITAL WAITING-LISTS

ABOUT a year ago the Department of Health, after nsulting the Scottish branch of the British Hospitals ssociation, announced that some 10,000 beds and the sources of new emergency hospitals and annexes built r war casualties would be made available for ordinary vil patients, provided they were short-term cases, and rgical rather than medical This was a praiseworthy tempt to overcome the anomaly of long waiting-lists the voluntary hospitals existing side by side with npty emergency hospitals Later the scheme was tended to include medical cases suffering from peptic ceration The scheme met with a poor response, the oluntary hospitals putting forward little more than 00 cases in the year This has been in part due to tients being undesirous of going to hospitals outside e cities but also it is said, to lack of full cooperation nd enthusiasm on the part of voluntary hospitals which ave found the waiting-list useful in soliciting public pport Now, in order to give the scheme every chance success, the department has removed all limitations ve one included are ' any and all patients medical and rgical, who might be expected to benefit from hospital eatment and who can suitably be treated in the spitals the only exception being the type of cases mmonly known as chronic " The scheme will be orked by the voluntary hospitals in cooperation with e department s hospital officers Doctors should not sitate to refer their patients to a voluntary hospital even though it has a long waiting-list provided they are willing to accept treatment in an emergency hospital No charge will be made to the patients but the department will receive from the voluntary hospitals a lump sum of 30*s* per patient, no matter how long or how elaborate the treatment may be Jan 16, 1941, may go down to history as the day on which the death-knell to the waiting-list was sounded in Scotland

PROFESSIONAL ORGANISATION

At a recent meeting in Glasgow of the Medical Practitioners Union Dr Alfred Welply, general secretary of the union described the Insurance Acts Committee as an incompetent instrument and advocated the organisation of insurance practitioners in a trade-union with separate branches for consultants and specialists to be affiliated to a body such as the Trades Union Congress Dr John F Lambie, chairman of the Scottish committee of the I A C said that the people to blame for the deplorable state of affairs which undoubtedly existed today were the practitioners themselves They were divided and sectional when they should have been united and energetic The crux was their psychological apathy That day for example at a meeting called for the Clyde area, only about 200 of the 1500 general practitioners in the area were present

---

In England Now

A Running Commentary by Peripatetic Correspondents

THIS outbreak of night-blindness interests one who has always liked the dark, who feels it as enfolding, protective and according to his mood either restful or inviting to adventure The psycho-analyst may read into this what he pleases, finding it perhaps the obverse of the fear of the dark that afflicts some people, a fear I chanced to become acquainted with in a school chum who, on more or less lawful nocturnal occasions, frankly admitted it and clung to my arm for comfort and assurance He interested me—I had, and still have, my own nasty little fears which I tell to no man—and ever afterwards I have kept tally of people who fear the dark Sometimes " What do you feel like in the dark ? " brings out more than I want to hear or than is even quite proper In messes, bars, drawing-rooms and other places where people talk, a census can be taken by leading in the subject of the instincts and asking whether fear of the dark is one of them When the ayes express themselves emphatically, we know they've got it Stimulated by these results and their possible relation to the current outbreak, I have tried to imagine how my fearful friends would fare in the blackout Assuming that my vision is normal (I am very fond of carrots) I have noted my impressions on a nightly walk through the back-streets after my day's work On the nocturnal occasions mentioned above I had learnt to use peripheral vision, looking ahead instead of down to see the foot-path, learnt to note outlines of trees or houses against the sky, and to shun the use of the hand-lantern of those days, for its glimmer did not make up for the loss of dark-adaptation—as I have since learnt to call it So now, going back to the ways of adolescence, I decline to use a torch though I carry one in my pocket lest, as my wife says I might drop sixpence I do carry a walking-stick to wave around when in doubt and to signify, by taps, my approach towards the folk whose attention is fixed upon the light at their toes and who, I find, are likely to bump me unless I take avoiding action They are less noxious than those who wave a light about, and a car with lights at eye level causes me to stand with back turned till it has passed

I haven't the patience to wait with eyes closed before setting out in the dark, for I find that several minutes are needed to give me a useful adaptation A church tower faces me as I start off, and a glance at it tells how dark the night is Then I walk along a narrow pavement where I may have to exercise faith whilst an invisible fellow-walker approaches and by his easy avoidance of a bump shows that he can see me even if I can't see him Still, I know the road and the silhouettes of the house-tops , I keep going, and soon I note the line of the kerb and may amuse myself by seeing it disappear when I look down at it, as happens when the light is dim enough to prevent foveal vision My field improves and

and the pooling of research or the establishment of a central research institute This sensible form of rationalisation has recently found expression in the formation of the Therapeutic Research Corporation of Great Britain To improve the pharmaceutical service in hospitals steps should be taken to ensure that every hospital containing 100 beds or more employs at least one pharmacist, and that proper arrangements for the supply of medicines by outside pharmacists are being made by smaller hospitals The historical accident by which there are in this country two independent statutory registers one for pharmaceutical chemists and the other for chemists and druggists should in the committee's view be remedied by making the examinations for admission to either register identical Membership of the Pharmaceutical Society has long since ceased to depend upon whether or not a person is in business on his own account and the society's charter object relating to "those who carry on business as chemists and druggists" might well be interpreted as though these words were replaced by the word "pharmacists"

The committee has completed a difficult task in surveying past and present conditions, and in making recommendations for changes which now seem beneficial Whether these changes will ever be made must depend upon the social structure existing after the war and the framework of the medical services in general

---

WOMEN TALK OF WAR-TIME NURSERIES

OUR national hero should not be St George, a prompt sort of fellow but that far more English character Ethelred the Unready Industry needs women, and women will come into the factories provided their children do not suffer The need for nurseries has been so long and so clearly established that only the dawdling English would still have to hold meetings about it nearly two and a half years after the need has become acute At the London Women's Parliament, which met at the Conway Hall on Jan 18, the old story was told again, but because many of the speakers were women who had had to meet the difficulty of divided service to children and factory, it was told vividly and in lively detail Mrs FELICE MACDONALD has three children, a girl of 7 a boy of 5 and a baby of 2 Her husband is in the Army, and "you know you can't manage on Army pay" she said She was anxious to work, but there was no nursery in her district She found a minder for the baby and another for the two older children and went into the factory, where she found she had to do night work and day work in alternate shifts of a fortnight each But she was good at it she was soon given a man's work she liked it and she took a pride in keeping her machine in action One morning the baby-minder decided that the baby was too much for her, and Mrs Macdonald gave up that day's sleep to search for another minder Then the minder of the two older children decided she couldn't manage them both, and a third minder had to be found Then the boy went down with mumps, and had to be transferred every morning, mumps and all from the house of the minder to that of the mother, and back again at night, when the other two took the infection Mrs Macdonald arranged to be on night duty for 6 weeks running, and spent her nights on duty and her days in nursing, with naps snatched as she could get them "I didn't mind, but I got very tired" For this very inadequate help she was paying £2 10*s* a week Another mother at the meeting was paying 12*s* 6*d* a week for each of her two children and was thoroughly dissatisfied with the care they were getting Often the minders are relatives—grandmothers or aunts Miss M E WEBB, of the Head Teachers' Association, pointed out that these relatives were often too old to take the responsibility, and besides they had their own shopping to do, they would turn the children out during the morning to play among the bricks in a devastated area or to get into danger from traffic There was a general feeling that the minded child was seldom suitably fed Moreover, as Councillor Mrs DIANA PYM, of St Pancras, pointed out, minding was an uneconomic way of using woman-power If a minder in charge of three women's children fell sick, three women stayed away from work In Russia, she said, if there was no nursery at a factory the women formed a rota among themselves to look after the children

At present in England in areas lacking a nursery the mother has to choose between neglecting her children and neglecting demands for her help in industry, this puts an unfair responsibility on her It is easy, but unfortunately not true, to say "women with young children could be spared" These young mothers have recently been in factory work, they are experienced they fit into the routine and they learn new jobs quickly as Councillor NAOMI WOLFE explained She felt our women are not being given their chance to play their full part in winning the war

That the demand for nurseries nursery schools and nursery centres is widespread was evident Alderman Miss E H HOUSE said that at Wembley 220 women had applied for a nursery without any advertisement being circulated Miss WEBB had collected evidence of a large demand in her neighbourhood, Miss D L HORNER told how the West Hampstead Cooperative Guild had established the need for a nursery in their district by canvassing the mothers, and Mrs S LOVAT, of the Rachel McMillan Nursery Centre said that 200 women had notified the centre that they actually knew of jobs in factories to which they could go as soon as enough nurseries were available Other speakers told of long waiting-lists of children at existing nurseries

Blame for the delay was laid chiefly at the door of the Ministry of Health, though some speakers put it down to lack of coordination between ministries and some to the slow grinding of local-government machinery Some delay certainly seems to be due to the demand of the Ministry of Health for detailed estimates for every item in plans put forward by local authorities While the ministry is pondering these estimates the prices of commodities rise, and in one case a blackout which was to have cost £50 at the time of the estimate had now soared to £150 and is still rising There is something to be said for acting first and asking later one local authority overlooked the blackout in the estimates, when they found out the deficiency they bought the blackout and sent in the bill to the ministry, which paid it There is, perhaps, even more to be said for preparing a cast-iron plan before submitting it to the ministry at all, as experience at West Hampstead shows, there the plans for the nursery were worked out to the last detail and were passed at once and the nursery was in action [illegible] weeks later Many speakers felt that where local authorities were willing and anxious to set up nurseries they should be given authority to spend a reasonable sum without waiting for the ministry's sanction Mrs PYM suggested that where a local authority was unwilling the ministry should appoint an overriding committee to get on with the job of establishing nurseries The difficulty of finding accommodation was not felt to be a great bar, Miss HOUSE said that though there was no spare ground in Wembley for setting up one of the ministry's prefabricated huts it was possible to get a house here and there She suggested that where a nursery was out of the way of the factory plans might be made for picking up the children at some central point Miss L STOTT, of the Nursery School Association, held that the people running the nursery were more important than the accommodation, and told of successful nursery schools in chapels and halls, and one in a public house Equipment can be simple—the simpler the better Staffing is difficult just now, but if the trained people are used in key positions, she thinks, semitrained people could work under them and learn the job Mrs MAYNARD L CARTER, of the National Society of Day Nurseries, who opened the discussion, suggested that girls of 15 or 16 who were too young for factory work could take this grounding in the nursery care of children

Miss WEBB summed up the general feeling of the meeting when she said "We won't get it done from the top down, but only from the bottom up," and urged all those who were in touch with a Women's Cooperative Guild or any other body, political or not to press their local authorities to set up nurseries The parliament decided to send a deputation to the Ministries of Health and Education to emphasise the urgent need for nurseries for war-workers' children this has not percolated through to our unscientific rs, who would have us forget No recrimination, squeal, thereby trying to deprive us even of the mentary intelligence of Pavlov's dogs Yet unless a iocracy chooses its leaders with care, going into their records, the same mistakes will be made again and in, for nobody changes in essentials after puberty

Letters to the Editor

PLANNING FOR CHILD HEALTH

IR,—It is becoming increasingly evident that our owledge of the factors affecting child health and our ins for improving and maintaining child health are dequate and incoordinate It has been suggested t the time is now ripe for the formation of a planning up in this branch of applied medicine The object uch a group would be to study child health and explore possibilities of improving the general health and fare of children, with *particular regard to social and* ironmental factors, nutrition and the better organisa-n and coordination of agencies for child care The up would be organised on regional lines, to facilitate meeting of members for discussion, and would have a itral organisation to correlate and coordinate the find-s and suggestions of the subgroups Membership uld not be confined to the medical personnel of the lth services but would be open to all persons actively icerned with or interested in the objects of the group, luding private medical practitioners, dentists, ichers, nurses and students

The first five of the undersigned have consented to act temporary regional secretaries for the South-East cluding London), the North-East, the North-West, South-West and the Midlands respectively Anyone erested *should* communicate with the secretary of the propriate region, who will supply further particulars

Kershaw has agreed to act in addition as temporary ieral *secretary of the group*

R **Dunstan**,
tanton, Lewes Sussex

A **Fraser**,
ounty Hall, Northallerton,
Yorks

HN D **Kershaw**,
own Hall, Accrington, Lancs

HN **Lishman**,
Medical Dept, 4 Barnfield
Crescent, Exeter

H **Wilkins**,
1 Vesey Road, Wylde Green
Birmingham

A **Auden**

LE **Gros Clark**

Eric C Downer
L Meredith Davies
W J Doyle
Mary Fisher
Mary L Gilchrist
J Maddison
D E. Mason
E H Marcus Milligan
W Lindesay Neustatter
J F Pilbeam
Eric Pritchard
Maitland Radford
R Sutherland
C Doswell Wallis
J Greenwood Wilson

PNEUMOTHORAX IN THE HOME

SIR,—Experience shows that in war-time we may pect an increasing strain on anti-tuberculosis schemes cases multiply the shortage of beds will be aggravated d waiting-lists will lengthen In Wales, patients who e waiting for beds are made to rest in bed at home d are taught to keep their own temperature records, d they are subsequently allowed to get up for a nger time each day the activity being carefully aded as it would be in hospital But often the character the patient, his ignorance of the disease and his ifavourable home conditions make it difficult to enforce oper rest, and housewives are particularly difficult to anage in this respect Could more be done at home anticipate hospital care?

During the last few years, working in the homes of e patients, we have induced unilateral artificial ieumothorax in 40 cases and (in cases where one lung is already collapsed) bilateral pneumothorax in 4 ie results have made us feel that the measure is justified all suitable cases where delay in admission to hospital ould prejudice the course of the disease or lengthen eatment In hospital, if a lesion is not too extensive, is usual to try the effect of rest in bed before inducing ieumothorax In the patient's home, where exact ray control is not possible, and the aim is to prevent read or cavitation of the original lesion indications for pneumothorax may be interpreted more liberally than in hospital Since, however, the only guides to progress are the condition of the patient and the temperature record, small cautious refills must be given at first When the temperature is normal, the patient can be graded up, and finally, provided suitable transport is available, can be brought to the clinic for X ray When he reaches the stage of taking exercise, refills can be given *at the clinic*

If there is no improvement within three weeks of induction, the patient should be X rayed if possible, *if this cannot be done, the treatment must be reconsidered,* since contraselective collapse, extension of the lesion or progressive valve-action cavities can be present without at first causing any rise in the patient's temperature The commonest complication calling for urgent treatment is spontaneous pneumothorax, no case of this occurred among our 44 domiciliary cases, and we have only seen examples after routine refills of cases at hospital or dispensary, and never after an induction Pleural shock is extremely rare There are, of course, risks attached to pneumothorax treatment in the home, but so there are to dispensary work where the patient has to travel home after a refill, and the risk of delayed treatment is often very much greater than the risk of induction The doctor should of course be on call, after giving treatment The chances of pleural effusion developing seem to be no greater than in hospital cases, if as great

If tuberculosis increases as rapidly as it did in the last war, and if the shortage of beds is complicated by lack of nurses, should not pneumothorax induction in the home be tried on a larger scale? As an emergency measure, medical students might help with routine X rays and refills

E A Aslett
T Francis Jarman

Tuberculosis Hospital Cymla Neath

NIGHT-BLINDNESS

SIR,—In your issue of Dec 27 (p 787) Flight-Lieutenant Yudkin stresses the irregular results of vitamin-A administration in night-blindness His view that an adequate dose is necessary is reasonable enough, but this contention is not strengthened by his finding that there is no standard level of blood vitamin A which would indicate whether a subject is deficient in vitamin A or not If irregularities in reaction, observed by himself and others, cannot be explained as varying deviations *from some* fixed standard, might it not be conceivable that some cases of night-blindness have no organic defect but are the subjects of some form of psychoneurosis? Night-blindness *is after* all *only* a symptom of a variety of conditions

Harley Street, W 1 **Arnold Sorsby**

INTRAOCULAR FOREIGN BODIES

SIR,—The last sentence of your review of Spaeth's "Principles and Practice of Ophthalmic Surgery" (Jan 17, p 78), and referring to the removal of magnetic intraocular foreign bodies, reads as follows "Professor Spaeth condemns the posterior route, except when its use is absolutely necessary—an opinion shared by most ophthalmic surgeons in this country" Surely this is contrary to present-day teaching? The removal of a magnetic *foreign body by the* anterior route, if it is lodged in the vitreous chamber, may prove a most dangerous operation whereas removal by the posterior route in such cases is a quicker *and safer method* giving gratifying results I would like to know the opinion of surgeons who are constantly removing magnetic foreign bodies from the eye on this subject

Sheffield Royal Infirmary **G E Robinson**

VOLPAR PRODUCTS

SIR—Dr Marie Stopes raises some interesting points in her letter of Jan 10 which need closer scrutiny She makes the surprising mistake of quoting the toxic effects of an *inorganic* mercuric *compound* used in a vaginal douche (the concentration of which she does not mention) as an argument against using a vaginal suppository containing an *organic* mercurial in such minute quantities that it would take something like 1500 suppositories swallowed all in one dose to kill an average woman Moreover the symptoms of poisoning by and the toxicity at last I walk on with no thought as to how I see I sometimes escort one who demands the indulgence of a torch, and then I regret the decay of the custom by which the swain pulled out the tail of his shirt and walked in front to guide his lady a Cotswold lantern I think they called it Only once was the sky so dark that my church tower was invisible So were the house-tops by which I am wont to set my course, and for once I felt helpless and had to wait whilst my visual purple recuperated To one of my fearful friends the anxiety of such a wait might be so intense as to demand security against its recurrence What security can he seek? "I'm afraid to go home in the dark" is a poor tale to tell, except when put into verse by the music-hall comic But night-blindness, already stamped with our approval, is no laughing matter so he joins the night-blind throng and becomes diagnostically *sans peur et sans reproche* We don't know how many there are like him, nor how many are too fearful, or too ignorant to give their dark-adaptation a chance even in an ordinary night If they tell the truth they may be scorned, but if they put up a brave lie they maintain self respect and the respect of their fellows So hurrah for night blindness! But if we talk too much Lord Haw-Haw might come to know of it, and it would be horrid to hear him tell the world we are going blind for lack of donkey-food

* * *

Once upon a time there was an Emperor, who held sway over many states and kingdoms each with its own ruler depending on his favour The Emperor was never known by name but only by the letter S When S said that brown bread was better than white all his subsidiaries ordered their subjects to eat the "Emperor loaf," which was nothing like so pleasant as juicy new white bread When S said that lawns were useless all the secondary rulers dug up the beautiful grass round their palaces and planted ugly rows of potatoes even under the very windows of their court reception-rooms One day the Emperor's magicians told him they had found the elixir of life in the pulp of the hips of the wild rose If these berries were boiled for 15 minutes, they said, this wonderful substance was extracted and with sugar could be made into a pleasant drink S thought that now he could cure all the diseases of his people and make them live for ever, and he accordingly ordered his subject monarchs to collect all the hips they could find and make this magical potion In one of the smaller provinces called Orchilia, ruled by the just Queen Alice, the Emperor's instructions were received as everywhere But Queen Alice had been troubled in the past by S's hair-brained schemes and had little faith in the spells of the magicians who worked for him Too often they thought they had achieved wonders, when they had in fact weaved only a very weak spell Also she knew that if she pulled all the rose hips in her kingdom the poor birds would die of starvation She therefore ordered that for the first year only enough rose hips to make an elixir to treat the sick should be made Her own personal magician was sent to the royal kitchen to examine the potency of each boiling He worked there for many days and often far into the nights and presently showed the Queen a better way of making the juice than the Emperor's At last the great work was completed and every morning at 9 30 all the sick and delicate who could walk came to receive from the Queen's own hands their dose of elixir All went well for many weeks but as the dark days of winter drew in it became clear that some evil spell had been cast over the bottles Some fizzed when they were opened, and at first this merely made the dose look more interesting, but one day when the Queen was undoing a cork there was a sizzle and white froth shot up in a foaming fountain which played for a few seconds all over the Queen She was drenched with sugary hip juice and had to change her robes of office there and then Queen Alice was very annoyed, elixir of life or no elixir of life it had no right to attack a Royal Personage The Court Magician was told to find out what this evil spell was and quick about it But this was not the only peculiar thing about the bottles The elixir from the fizzy bottles had a different taste and affected the sick people in a peculiar way Some said that the floor became wavy after their daily dose, others saw double, but most became just happy and cheerful After long experimentation the Queen's Magician sent in his report "Be it known to Your Majesty that after much travail and turmoil we have found that there is in your rose-hip juice an evil spirit called Alcohol This spirit is condensed into the bottle along with the East Wind if the magic word 'Yeast' is said five times to each point of the compass in succession When the bottles are uncorked the East Wind blows out of them and it was thus that Your Majesty met with her lamentable accident There is no satisfactory counter spell save only to open the bottles frequently and allow the East Wind to escape bef too much has formed" The Queen did not wish to uncork the bottles too often, for she lost much of the contents each time So one day when sitting in her royal chamber she heard a loud bang in the cupboard where the bottles were kept The Queen was terrified that some evil person had put a bomb in the cupboard, but when she plucked up courage to look it was only one of the bottles that had burst She was so angry that in spite of the Emperor's order she poured all the hip juice down the drain About an hour later when she remembered how much sugar had been lost she wept bitterly, for sugar was pretty scarce in Orchilia

* * *

The amateur pantomime was good enough to justify the tedious journey there and back through belt of almost impenetrable fog The town hall was packed and the walls lined two-deep with those unable to get seats Luxuriating in my two-and-sixpenny stall, I soon became aware of the presence of a small, pop eyed girl who was propped uncomfortably against the wall, but apparently quite unconscious of everything except the action of the piece She stood first on one leg and then on the other until, half-way through the first act, I could bear it no longer and drew her on to my knee So full of "theatre was she, so completely stagebound, that she had no time for anything except an occasional ecstatic wriggle, no time even to munch the sweets proffered by my small daughter Whenever the genie, preceded by his magnesium flash, appeared she jumped I also jumped but we never seemed to jump simultaneously a painful business At first she was as light as a feather but she grew heavier and bonier as the show went on, and I looked forward to the intervals There was no pogo horse, but the pogo-dragon, neatly bisected after a long fight by Aladdin's sword, was a worthy substitute To our great delight Wishee-Washee, Widow Twankey's laundryman was once more put through the mangle and, hoist with his own petard as you might say, came out beautifully flattened The clowns discoursed most eloquent music from the most unpromising instruments—one fashioned from a broomstick, and a single strand of wire stretched taut over a distended bull's bladder Bulls' bladders must be hard to come by these days Are they, I wonder rationed as offal? On the way home we encountered worse fog, and I was constrained to drive on the right side of the deserted road so as to steer by the curb The fact that I was doing so deliberately could not be accepted by the children, who were determined to be helpful "You're on the wrong side of the road you know, Daddy," one or other would remark at intervals At one dark stage of our journey a kind man, taking his dog for a walk, volunteered to act as linkboy and, though nearly run over a score of times, actually wished us a Happy New Year when he took leave of us He is lucky to be alive We arrived home during the nine o'clock news, "lovely and late" as the children said

* * *

I was a bit shaken by the paper suggesting that there is a greater incidence of skin diseases, especially parasitic ones, among the less intelligent, another demonstration that these people get wetter in rainy weather would be equally interesting These penetrating and laborious glances into the obvious seem at first rather a waste of time and paper Yet I am not so sure I have a feeling that the reiteration of nursery wise-cracks, of textbook truths, may really be one of the principal functions of a medical journal, not only the medical but the lay should from time to time go back to first principles, much original work is unconsciously directed to this Take for instance Pavlov's work on the conditioned reflexes and the spate of literature and animal m it evoked, couldn't it really have been summed up in old home truth, that we animals learn by experienc peptics among the reserves and elderly soldiers has in any way diminished the number of admissions to pital on account of dyspeptic symptoms or of those ing discharge from the Services or treatment for ous stomach trouble Surely it is much too early to e, as he does, that there is no increase in the incidence peptic ulceration as a result of the war All the ors which were present before the onset of this crisis still at work The number of perforations treated rly has not diminished—in certain districts it has wn a definite increase—and in any big outpatient artment the number of dyspeptics requiring investiga- and treatment is found to be on the up-grade

ow the Army is discharging a large number of patients ering from proved—and sometimes unproved— tic ulcer No special centres have been set up it ns for dealing specially with these cases, nor have any ins been devised for tackling a problem of vital ional importance The Army, too would seem to make provision for the man who develops a peptic ulcer yet wishes to remain in the Forces I would suggest t for key-men, and for soldiers with special or expert erience everything possible should be done by the ny authorities to render them fit for their present ies or something of a lighter character, so that their ices may be retained The impression gained from it has been written since the outbreak of war about dys- sia in the Army is that medical or surgical treatment, n efficiently applied by experts will not render a man for further service with the Forces Again, a man on vice who has had an acute perforated peptic ulcer cessfully sutured is, nevertheless, automatically in- ded out of the Army, although there is abundant tistical evidence to show that fully 30% of simple ure cases will remain free from symptoms for the rest their lives

My own opinion is that prolonged and well-applied dical treatment, or if complications supervene surgical erference, will often render a man sufficiently fit for ne useful sphere of duty, much as in civilian life If, ever, a soldier has a gastric or duodenal ulcer or is fering from a severe form of chronic gastritis, and if he etermined to secure his discharge from the Forces no ount of treatment will cure him

Wimpole Street, W 1   RODNEY MAINGOT

SALMONELLA MENINGITIS

SIR,—Writing in your issue of Dec 20 on the diagnosis Pfeiffer's bacillus *meningitis* Dr Mutch remarks that e clinical features of salmonella meningitis resemble ose of influenzal meningitis, but a history of diarrhœa ay replace that of respiratory catarrh During my tivities as an assistant at the Bacteriological Institute the Charles University in Prague where I worked for ny years, I had the opportunity of examining many ebrospinal fluids, and noted some in which micro- ganisms of the paratyphoid-B group could be isolated thout history of gastro-intestinal disturbance My ief Professor Honl, described forms of bronchopneu- onia caused by micro-organisms of the paratyphoid-B oup, and I described in 1930 (*Czech med J* no 24) case of bronchopneumonia in which micro-organisms re isolated from the sputum and urine identical with ct *nocard*, and tallying with a strain kept by Prof Legroux in Paris

Glaxo Laboratories   J UNGAR

“A CONTRAST”

SIR,—I will not disappoint Miss Carter The Secretary the Nursing Recruitment Centre seems satisfied that many” training schools now offer excellent conditions nurses, though she acknowledges that “there is still uch to be done before all nurses everywhere get a fair al” If we remember that the hospital to whose angements the Cornish coroner called attention was institution financed by both Treasury and Local overnment grants we see that the responsibility for nagement rests upon the public, as indeed does that of ctically all hospitals today Doubtless the Nursing ecruitment Centre would guide the steps of aspirants one of “over 700 approved schools,” but what pro- rtion of girls seeking employment have ever heard of nt advisory body in London? Local opportunities peal to them and to their parents Have they not a right to expect that publicly controlled institutions should offer reasonable conditions to their so-called trainees? Can any of us be sure that the state of affairs referred to was indeed “extremely atypical”—particularly, perhaps, in small hospitals in semi-rural areas? Does not the very shortage of nursing candidates emphasise rather the lack of the ‘fair deal than its prevalence? That nursing is indeed ‘a fine career” is shown by the thousands who do, year by year, stand up to its discipline and rejoice in its opportunities for service The black spots and the effect of them upon the whole should be the concern of all, but the allied professions of medicine and nursing should be sensitive and alert to recognise and meet the hindrances operative today

Northwood, Middlesex   ESTHER CARLING

Obituary

JOHN GRAY CLEGG

M D LOND, M B MANC F R C S

Mr J G Clegg, who died on Dec 23, was consulting surgeon to the Royal Eye Hospital, Manchester, and one of the best known ophthalmologists in the North of England Educated at the Manchester Grammar School and Victoria University he qualified in 1891, and in the following year graduated with high honours both at London and Manchester He became house-surgeon to the Royal Infirmary and assistant demonstrator of anatomy, collaborating with Alex Wilson in a descriptive catalogue of the pathological museum In 1894 he took the F R C S and was appointed house-surgeon to the eye hospital with which he was connected until his retirement as senior surgeon in 1931 He was also ophthalmic surgeon to the Royal Infirmary and University lecturer in ophthalmology Clegg was a genial colleague and his wide knowledge of ophthalmology always freely given, was often of the greatest help to fellow members of the staff An excellent clinician, good operator and sound diagnostician, he had the rare gift of imparting his knowledge in a simple manner, and hence his success as a teacher He invented a *retro-transilluminator* which proved useful in the diagnosis of intra-ocular tumours A man of boundless energy, he was a regular attender at scientific meetings in London and the provinces, to which he contributed many valuable papers Some of these appeared in the *Transactions* of the Ophthalmological Society, one of the more notable being an account of 250 trephinings of the sclerocorneal junction for hypertension He was a lifelong teetotaller and non-smoker and a staunch adherent of the Wesleyan Church Soon after his retirement he went to live in London He married in 1924 and his widow survives him

OSWALD LACY ADDISON

M B LOND, F R C S

THE death of Jan 8 of Oswald Addison will cause deep and sincere grief in the hearts of a very large number of friends A Marlborough boy, he received his medical education at University College Hospital, qualifying in 1901 when he became house-surgeon to Sir Victor Horsley, then at the height of his fame There too he formed a close friendship with the late George Waugh which lasted till the latter's untimely death After holding the post of surgical registrar at UCH, he went to the Hospital for Sick Children, Great Ormond Street, where he succeeded Waugh as medical superintendent, and where later the two were colleagues on the surgical staff Addison's work was centred chiefly at this hospital and at the West London which he also served for many years As a surgeon he escaped the somewhat ambiguous epithet of ‘brilliant,” but he had in full measure those sure qualities of surgical greatness—good judgment, gentleness and dexterity It was characteristic of him that he never hesitated to consult a colleague before operating if he thought the latter had had more experience of the type of case to be dealt with but it was noteworthy that the resulting operation was perfect Painstaking and honest care were always there when Addison was in charge of a case His courtesy to sisters and nurses in the theatre and elsewhere was never failing Despite his modesty he made several outstanding contributions to surgery, notably those on cleft palate and of mercuric chloride and phenylmercuric acetate are not the same

Dr Stopes reiterates that she hears a good deal of objection to 'Volpar' and that she is certain that volpar is injurious but she does not tell us what the patients complain of nor on what clinical facts she bases her certainties These are grave accusations, may we not therefore have some facts and figures?

Finally Dr Stopes maintains that no-one should prescribe any chemical for use in the vagina which the prescriber is not willing to consume with equal frequency by mouth Rather a tall order however I feel tempted to take up the challenge and although I am not prepared to swallow a daily dose of 'Devegan' or 'Stovarsol' tablets, which I not infrequently prescribe for vaginal medication, I am prepared to eat a volpar gel with my breakfast every day for as long as Dr Stopes would like to suggest

Crediton, Devon MARGARET HADLEY JACKSON

SIR,—I have read with interest Dr Marie Stopes's letter While I regard her policy of not putting in the vagina what she would not take by mouth as very sound I consider that in this case she is being unduly squeamish 'Volpar' gels are stated to contain 0 000 9 gramme of mercury, in the form of phenylmercuric acetate Calculated as $HgCl_2$ the most usual soluble mercuric salt, this comes to 1 22 mg of a salt whose minimum *BP* dose is 2 mg It seems therefore that the daily consumption of one gel by mouth is unlikely to hurt anyone, and, if the converse of Dr Stopes's statement is true it would be safe to use it in the vagina, even if the absorption there were as great as in the alimentary tract

Witham, Essex J W NICHOLAS

E M S SURGEON'S LIBEL ACTION

SIR,—My attention has been called, though somewhat belatedly, to the report in your issue of Nov 1 1941, of an action in which I was the defendant This report gives the unfortunate impression that my letter which was the subject of the action was both mistaken and without reasonable foundation, *also that the plaintiff* only withdrew his action because he was unable to prove malice In fairness to the hospital authorities, the plaintiff's colleagues, the Misses Barry and myself you should have reported the evidence given in court to the effect that the Hospital Committee thought that I had good grounds of complaint You further print the plaintiff's charges that I refused to verify or withdraw in any way, as if these charges had been confirmed by the proceedings This was not the case I sought every opportunity of making amends for any injustice or excess of criticism there might have been in my letter, only refusing to sign an unconditional and dictated apology, since this appeared to violate my freedom of conscience on a matter of public concern

Haverstock Hill, N W 3 TOM SARGANT

*** While slow to admit any unfairness in our account of Whale *v* Sargant (*Lancet*, 1941, ii, 535), we gladly print the defendant's letter His counsel's statement ended the proceedings by no means ungenerously, and there the parties and the public may be content to leave them —ED L

BACTERIAL CONTAMINATION OF CEREBRO-SPINAL FLUID

SIR,—It was a pleasure to read Professor and Mrs Wilson Smith's finished paper of Dec 27 The bacillus they describe is an old nuisance, it appears in other body fluids such as pleural effusions, and can often be traced to certain wards, instruments or manipulators One way of checking it might be to use the single bacteriological lecture allowed to nurses simply for demonstrating contaminations People are only convinced by visible signs and the results of a few drops of "sterile" water or exposure to the air on a culture plate can be quite effective Many nurses do not understand the difference between sterile and distilled water, and they cool perfectly good boiled needles with distilled water Methylated spirit is also a deceiver and needles are handed out of the spirit trough on the assumption that they are sterile I have grown a bacillus corresponding with Professor Wilson Smith's from spirit in which the ward needles are kept The principles of sterility are simple and practice only requires great care, depending largely constant supervision of the resident house officers will be a great help to pathologists if they will take of this valuable paper

Ashford, Middlesex NORAH H SCHUSTER

POSTURE DURING SLEEP

SIR,—A personal experience may interest Dr L and others who have addressed you on this subj About 29 years ago discomfort, a sensation of weight a occasional pain in the right iliac fossa necessitat sleeping on the left side to get relief This conti throughout the last war when continuously on act service with the Army After retirement in 1922 t exertion of handling a 7-ton sailing boat single-han produced some slight cardiac embarrassment acco panied by loud audible murmur and frequent beats when lying on the left side—but always by lying on the right side This I have continued for now nearly 20 years with a fist tucked into the iliac fossa I am now in my 80th year Incidentl during many years of surgical work patients with slight discomfort in the cæcal region commonly relief when directed to sleep on the left side Many did not come to operation

Farnborough M P HOLT

THE DYSPEPTIC SOLDIER

SIR —In his valuable statistical paper (*Lancet* Ja p 39) Colonel Brockbank has done much to clarif controversial points about dyspepsia in the Arm is surprising however, to learn from him that 1 of his proved ulcer cases were diagnosed as in pyloric ulcer, as this figure does not coincide with published by other authorities, nor was I aware that th was such a high incidence of simple pyloric lesions am soldiers In civilian practice the finding of a ch callous pyloric ulcer demanding intensive medical tr ment or operation is rare If we add together the pyl and gastric ulcer cases mentioned in table I we find th 28 6% of the total proved cases of peptic ulcer involv the stomach These figures should be compared wi those submitted by Urquhart, Singleton and Fe (*Canad med Ass J* 1941 45, 391) in which it is sta that of 377 cases with definite organic disease 360 c (or 96%) had duodenal ulcer and only 4% ulcer of t stomach Such a disparity between Canadian British soldiers is puzzling Colonel Brown (quo by Brockbank) assesses the number of men w chronic peptic ulcer and chronic gastritis discharged f the Army through a certain medical board at 17 a figure lower than that quoted by the Canadian jour in which it is computed that of 839 soldiers returned Canada for medical reasons between July 1 1940 June 30 1941, no fewer than 21% were invalided because of peptic ulcer There is no doubt that chr ulcer of the duodenum and stomach accounts fo relatively high percentage of waste of man-power am the Services, although the proportion of chronic dy tics admitted to hospital probably does not exceed 10

I agree with Colonel Brockbank that in the Serv all cases of chronic dyspepsia which give a hi exceeding one month should be admitted to a w staffed and well-equipped hospital and put throu routine investigation including a barium meal X examination of the stomach *and duodenum*, gastro in cases in which the lesion is proved or suspected to b the stomach fractional gastric analyses, complete bl examination examination of the stools for blood an gall-bladder dye test Diagnosis should not be b simply on the history and a physical examination in outpatient department Furthermore, X-ray pict of the gastro-intestinal tract are valueless unless t and interpreted by a skilled and experienced radiolo

Colonel Brockbank states that the vast majorit dyspepsia cases originate in civilian life, and yet jud by table I there does not seem to have been any app able falling off in the number of dyspeptics attendin hospital during the period under review For inst in December, 1939, there were 50 admissions an December, 1940, there were 54, and this increase been the experience of most general hospitals thr the country The wholesale weeding out of chr

ORIGINAL ARTICLES

AN OUTBREAK OF PARATYPHOID B
IN BRISTOL

I G DAVIES, M B LOND , D P H
PUTY MEDICAL OFFICER OF HEALTH, BRISTOL , DEPUTY DIRECTOR PREVENTIVE MEDICINE LABORATORIES, UNIVERSITY OF BRISTOL

K E COOPER,
M R C S , PH D LEEDS
SENIOR BACTERIOLOGIST AND LECTURER AT THE LABORATORIES

D S FLEMING,
M D MCGILL
MEDICAL OFFICER TO THE AMERICAN RED CROSS AND HARVARD FIELD HOSPITAL UNIT

With a Note on the
ROUTINE INVESTIGATION OF FOOD-BORNE EPIDEMICS

H M GOULD, M S I A
SENIOR FOOD INSPECTOR

RONALD WILLIAMS, M S I A
FOOD INSPECTOR

DURING 1941 there was an epidemic of paratyphoid B Bristol, and during the period Aug 18 to Oct 30 268 spected cases were notified , of these, 244 gave evi- nce of paratyphoid B infection The dates of onset of e proved cases ranged between July 28 and Oct 12 n Aug 19, 5 cases were confirmed bacteriologically as aratyphoid B and these were followed by the notifica- on of a further 10 cases on Aug 20 By the end of the rst week over 70 cases had been notified and 145 by the nd of the second week. Cases continued to be notified p to Oct 20, by which time a total of 244 persons had iven evidence of paratyphoid B infection These were onfirmed as follows paratyphoid B isolated from fæces, 14 , diagnostic agglutination reaction, 13 , *confirmed in* ther laboratories, 17 In all, 203 cases were clinical para- phoid fever and 41 were intestinal carriers , 167 of the 03 cases were primary and the remaining 36 secondary.

SOURCE OF INFECTION

Investigations were begun on Aug 19, immediately fter the confirmation of the 5 cases A common food as soon established and confectionery prepared by a rm A in the city came under suspicion On Aug 21, a ll investigation of this firm's premises and staff was ade and the investigation narrowed itself down to a rl employee (X Y) This girl had had a vague history f headaches and malaise and had ceased to work there n Aug 2 Her home was visited on Aug. 21, when it as found that she had subsequently been employed at wo places—B (a cafe) and C (a bakery), where she was ow working As she still complained of headaches, she as persuaded to have blood and fæces examinations nd to stop work immediately until the results were btained *Bacterium paratyphosum B* was isolated rom her fæces Full precautions against any further nfection were taken and arrangements made to examine lood and fæces of all the workpeople engaged in the andling of food at firms A, B and C Specimens of onfectionery and food and all the ingredients used in the aking of artificial cream were also examined at these laces, with negative results

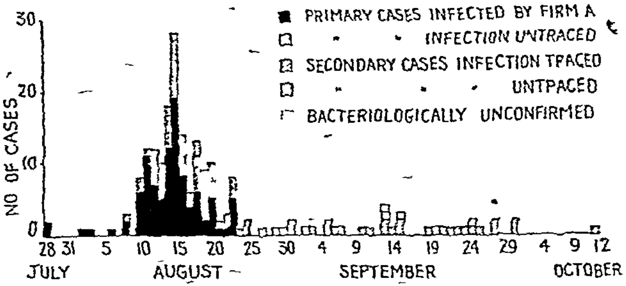
Of the 167 primary cases 102 (61%) had consumed rtificial cream from firm A and opportunities for infec- ion of this cream by X Y were present in each case f the 41 intestinal carriers, 19 had consumed artificial ream from this firm , 9 were members of families in hich a known case had occurred and 6 belonged to a amily known to have consumed infected cream , 13 were untraced

We are satisfied that the cause of the explosive outbreak of clinical cases and of the carrier state in 25 persons was artificial cream infected by X Y , although at no time was *Bact paratyphosum B* isolated from any foodstuff or from the artificial cream which was undoubtedly the vehicle of infection It must be remembered that the foodstuffs and cream were not examined until Aug 21, the earliest date at which firm A could have come under suspicion, and by this time infection of the food at this particular firm must have ceased since the only infected person found had left their service 19 days previously

An analysis of the dates of onset (see figure) show the earliest cases began on July 28, but the numbers increased rapidly after Aug 8, rising to a sharp peak on Aug 15 (28 cases in one day) with a rapid fall by Aug 25 This explosive primary wave accounts for 167 of the total 203 clinical cases ; 3 primary cases are not included in the graph because their onset dates were not precisely defined

CASE-HISTORY

X Y , the girl with whom the outbreak originated, was aged 18 and had been working as a clerk in various posts up to April 10, 1941, when she went to a bakery to learn confectionery-making She began to work for firm A on July 10, and was engaged in preparing artificial cream for making jam and cream cakes She spooned this cream into a cone-shaped confectionery bag, and it was her custom to bite off the apex of the bag and squeeze out the cream for the decoration or filling of cakes and pastries She left this firm on Aug 2, when it closed for Bank holiday, and did not return , the firm was under the impression that she was away ill, since she was said to have complained of headaches (No other person failed to return to work at this firm on Aug. 5) Actually, she started work with another firm, B, on Aug 5, and was later transferred from this shop and cafe to their main bakery, C, on Aug 17, where she was working when visited on the 21st She was still complaining of headaches Samples of blood and fæces were obtained on Aug 21 The blood gave negative agglutination for TAB (H) at 1/25 dilution and agglutination of T (O) at 1/50 *Bact paratyphosum B* was isolated from the fæces on this date She was removed to hospital, where she developed clinical paratyphoid fever and on Aug 26 became a fairly severe case with a rapid rise of temperature On Sept 2 her agglutination was 1/5000 for para B (H), negative for T (H) and para A (H) at 1/25, and positive for T (O) at 1/50 Her fæces were positive on Sept. 2, negative on Sept 23, positive again on Sept 29, then negative on Oct 5 and 6



Dates of onset in 200 cases of paratyphoid B infection.

RELATION OF X Y TO THE OUTBREAK

Repeated examinations of the fæces and urine for *Bact paratyphosum B* and the agglutination reactions of all persons working at firm A were made and except for X Y all gave negative results Full opportunities existed at all material times for the infection of the cream by this girl, who was the only person in this firm found to be excreting *Bact paratyphosum B* in the fæces Moreover, no evidence of infection of food prepared by this firm after Aug 2 (the date when X Y ceased work there) has been discovered Despite the fact that agglutinations for paratyphoid B did not appear in her blood until Aug 21, and that she did not develop into a well-defined clinical case until Aug 26, it is highly probable that she was infective before Aug 2

The figure suggests that heavy infection of cream at firm A was taking place around Aug 2 Further, since the firm was closing down for the bank holiday on Aug 2, customers purchased and kept pastries for consumption during the succeeding three days, which included Sunday and bank holiday Monday The atmospheric temperature on those days was high being 74° F on Aug 1, 78° F on Aug 2 and 75° F on Aug 3 , indeed, except for July 25, these were the hottest days in August and the latter part of July Artificial cream is undoubtedly a good medium for *Bact paratyphosum B*, and under rough incubation conditions would produce a very heavy infection We are able, through a lucky coincidence, to give an excellent example of this infestation In neither patient had the diagnosis of cysticercosis been suggested though there had been many medical examinations

SUMMARY

Radiography permits of the diagnosis of cysticercosis when the parasites have degenerated and calcified, but affords no help in the earlier years of infestation Writers in recent years have focused undue attention on the effects of the dead parasite, even to the point of advising against any treatment likely to kill it Actually, it is rare to obtain radiographic evidence of cysticerci in the brain in patients with symptoms of central nervous disease The more important symptoms occur at the time of infestation and during the development of the parasite, and these are misinterpreted In later years, when symptoms have as a rule ceased, radiography for other reasons may reveal the calcified parasites

Attention to the early diagnosis and treatment offers a hopeful outlook By simple preventive measures the disease could be eradicated

REFERENCES

Brailsford, J F (1941) *Brit J Radiol* 14, 79 (1926) *Proc R Soc Med* 19 41
Dixon, H B F and Smithers D W (1934) *Quart J Med* 27, 603
Ewing C W (1941) *Brit med J* ii 26
MacArthur W P (1933a) *Trans R Soc trop Med* 27, 313, (1933b) *Ibid*, 26, 525

ARRAYED AGAINST RHEUMATISM

THE pamphlet setting out a national scheme for the control of rheumatism [1] published early last year by the Empire Rheumatism Council has roused encouraging comment In the council's fifth annual report Lord Horder says that the situation in regard to rheumatism treatment has now been surveyed and it remains to persuade the community to take action He feels that plans should be made now, even if we must wait for peace before some of them can be put into action During the year reviewed several advances have been made The Carnegie Dunfermline Trust has decided to bring rheumatism treatment in the burgh into line with the standard achieved in other social welfare work In Aberdeen a treatment centre is to be set up, thanks to a bequest of Miss Margaret Ann Cran Research has continued though it has been subject to serious checks, the search for the cause of acute rheumatism continues and workers are seeking a serological or biochemical test for rheumatism The Naval Research Foundation has made progress, under Dr C A Green The work of the Sir Alexander Maclean laboratory is being carried on by Dr C B Dyson Clinical research has been hampered by lack of treatment centres which can provide the necessary controlled conditions Lord Horder suggests that the community should invest a sum to bring rheumatic disease under control, and the *National Insurance Gazette* (Jan 8, p 19), commenting on the report, proposes that a national plan might begin to take shape through the physiotherapy departments and rehabilitation centres of the emergency hospital scheme Certainly any system which would make early treatment available for every rheumatic patient would save much pain, disability and expense

SOCIAL CURE IN AMERICA

THE annual meeting of the American National Conference of Social Work was held in Grand Rapids from May 26–June 1, 1940, and the proceedings,[2] consisting of fifty-nine selected papers, have now appeared Social work was interpreted by the conference in the widest sense Grace Coyle, in her presidential address, and many other speakers were deeply concerned with the situation resulting from ten years of depression—4 million youth unemployed, a generation of old people without resources or security, and a third of the nation, in the words of President Roosevelt, "ill-fed, ill-clothed and ill-housed" Between half a million and a million unemployed, or when employed underpaid, people are constantly on the road, largely drawn from agricultural workers who have been superseded by machines Miss Coyle maintained that the basic cause of illness un ployment and other troubles was poverty

In a period of exceptional difficulty a significant cha has taken place in the conception of Government ponsibility for public health Thus hospitals are b supported by state and local authorities, and the s of public health departments has been extended G medical care for farmers and their children (a third of nation's youth) has been begun, and schemes of mater and infant welfare have been improved in certain tricts But there is a lack of system in the p medical services, and the opportunities offered in h and education in different areas and among dif sections of the community are unequal Mr M Davis, chairman of the New York Committee on Re in Medical Economics felt that tax funds should merely buy medical care for needy persons but shoul so administered as to ensure that the care wa w buying Dr Kingsley Roberts advocated a n health programme the central figure in which w the family doctor, "the keen, highly trained diagn who uses specialists as an extra set of fingers and to serve his patients—the central figure in a medical-practice unit" Both doctors and social w emphasised the importance of the human relati between themselves and the people among whom work

Births, Marriages and Deaths

BIRTHS

BACH—On Jan 18 at Little Kingshill, Great Missenden of Dr Francis Bach—a daughter

BLACKBURNE—On Jan 16, the wife of Major J R Black R A M C—a son

CRAWFORD—On Jan 11, at Bath, the wife of Surgeon Com T G B Crawford—a son

HUTCHINSON—On Jan 11, at Haywards Heath, the wife of H P Hutchinson—a daughter

KING—On Jan 11, at Carlisle the wife of Dr John Ki

MANIFOLD—On Jan 16 at Cheltenham, the wife of Major R Manifold R A M C—a daughter

MARRIAGES

ANDERSON—CARRIER—On Jan 12 at Barkby, Andrew W Anderson M R C S to Eva Daphne Carrier

BOWE—MUNRO—On Dec 9, at Aden James C Bowe, squadron leader, R A F, to Ruth Margaret Munro

FLOWERDEW—STEWART—On Jan 10, at Bournemouth F Mackworth Flowerdew, captain R A M C, to Margot Ste

HARGREAVES—MACMILLAN—On Jan 15, in London, Ed Arthur Hargreaves M R C S, to Sylvia Macmillan M B

MILLS—BRENAN—On Jan 3, at Bathwick Bath, John Mills B M, to June Rosemary Jill Brenan

WHITELEY—GOODMAN—On Jan 7, at Antrim, Henry Wh M B, R A M C, to Kathleen Goodman

DEATHS

DAVIES—On Jan 15, at Tenbury Wells, Evan Davies M B D P H

DAWE—On Jan 10, at Bath, James Henry Dawe, M B Edin retired

GARDNER—On Jan 17, Douglas Humphrey Gardner, M B of West Byfleet aged 49

GUEST—On Jan 15, in Oxford, Edith Mary Guest, M A M D Lond

HUMPHREYS—On Nov 16, at Rostrevor, Northern Ir Charles Style Humphreys, M D Brux, L R C P, aged

HUNT—On Jan 16, in London, William O'Connor Hunt, L R C aged 59

LANG HODGE—On Jan 14, at Yelverton, William Lang H M D Durh, M R C P E, F R C S E

TOMBLESON—On Jan 14 at Stratford on Avon, James Tombleson M B Oxfd, formerly of 12, Manchester S London, W 1, aged 69

Appointments

DUNLOP JOHN, M B EDIN, F R C S E examining factory for Abercarn, Monmouth

HIRSCH, EMIL, M D MUNICH, L R C P E R M O at Far County Hospital

HOLLINGWORTH GEOFFREY M B EDIN surgical registr Nuneaton Emergency Hospital

KLEIN, N N, M D BRNO senior asst radiologist to Gl Royal Infirmary

TOWNSLEY, GERALD M D BELF F R C S asst radiother surgeon to St Bartholomew's Hospital Rochester

WOOD, W C S, M B LOND, D L O temp asst M O H for F

The fact that goods made of raw materials in supply owing to war conditions are advertised in paper should not be taken as an indication that th necessarily available for export isions 1–5 were all served by firm A or its subsidiaries ne 60% of the cases arose in divisions 1 and 2 together, these were also the principal districts supplied by n A, the firm itself is situated in division 2 and part ivision 1 is served by firm A only There are 12 large ery and confectionery establishments in Bristol m A's business represents only about 14 8% of the al, yet over 60% of the cases were traced to this firm

---

[1] "Rheumatism—A Plan for National Action" See *Lancet*, 1941, i, 547

[2] Proceedings of the National Conference of Social Work, 1940 London Humphrey Milford, Oxford University Press Pp 736 20*s*

GENERAL CONCLUSIONS

n non-epidemic times there are people in every city ermittently excreting *Bact paratyphosum B*, and it ds certain primary conditions simultaneously present ore an explosive outbreak will occur The most able method of controlling an outbreak is by bacterio- ical examination of the fæces, and we are convinced t control is not possible merely by Widal testing In s outbreak and in a previous outbreak in this city[2] have established that a relatively large proportion of riers who are excreting paratyphoid bacilli show no nificant serological change at that time Unless angements are made for the bacteriological examina- n of every suspected person and contact, numbers of ngerous infections will be missed There is evidence show that in any outbreak the incubation period of the ividual case varies with the infecting dose

n epidemiological team is necessary, headed by an emiologist and bacteriologist working together in the ratories Such a team is described below

ontrol of the methods of manufacture of food is essary There are a number of methods of manu- ure in which conditions may be said to be almost l for the infection of food—for example, in one stage he manufacture of artificial cream the food handler is rally up to the elbows in cream

Investigation of Food-borne Epidemics

n Bristol the food inspectors' department is housed in same building as the preventive medicine laboratories he University of Bristol The medical officer of health rofessor of preventive medicine and also administra- director of the laboratories He is assisted by the uty medical officer of health, who is deputy director the laboratories, and by the senior bacteriologist, ether with a team of food inspectors The importance of arrangement lies in the fact that there always exists a rdinated team and routine arrangements to deal with d-borne disease This team can be augmented at any ment on the field investigation side by sanitary inspec- s and health visitors—the whole being directed by the dical officer of health and the senior bacteriologist

Notifications by medical practitioners of all cases of d-borne disease are received by the medical officer of lth and immediately relayed to the food inspectors' partment At the same time the bacteriologist is ified A food inspector then proceeds to the home of h patient and carries out a primary investigation into history of the patient, date of symptoms, contacts, its made and visitors received From the information tained the probable period of infection is calculated this stage within the widest limits The inspector o inquires about sources of supply of all foods con- med by the patient during this period

As soon as it becomes evident that cases are beginning share a probable period of infection an intensive quiry is directed to this period by the use of detailed od lists, which coupled with the primary investigation cords prove valuable epidemiological tools A de- iled food list is headed with the name and address of e patient and the dates of the probable period of fection, the list includes 127 varieties of food and is rly exhaustive It is found that much more detailed formation is obtained when persons are allowed to tain the list for a day or so for consideration by the hole family than when questioned at length on the first sit This procedure saves the investigator's time e lists are collected, and sources of food-supply divided to groups (such as grocer, dairyman, fishmonger) are arched for common factors Caution is necessary in the terpretation of these lists, thus a firm may appear as e supplier of pastries in 90% of the cases in a particular strict, but it may so happen that the firm is the only nfectionery in that district

At the time of the primary investigation the inspector arranges that all contacts and suspected persons are supplied with fæces outfits for the early submission of specimens As soon as suspicion is aroused that an outbreak is impending, the medical officer of health augments the team with additional sanitary inspectors and health visitors who form two teams of field investigators, the sanitary inspectors dealing with all food shops and premises and the health visitors with home visits All suspected homes and contacts are visited every 3 days

When it is found that certain food premises appear to be a common factor, a complete investigation is made into the methods of production, materials used, and especially into the state of health of the staff, attention being particularly directed to the time of the probable period of infection The firm is asked to provide a statement containing such information as the number of staff, absentees, dismissals, resignations, new appointments, and also names of retailers supplied by them All employees who are, or have been, absent during the period in question, or who have a history of illness, are followed up and persuaded to have blood and fæces examinations The remainder of the staff are dealt with in the same way Where a suspected firm, such as firm A in the recent epidemic, is found to be supplying a large number of retailers, these are investigated by the team of sanitary inspectors who carry out the routine inquiries into the health of the staffs at these subsidiary firms All information collected by the team is referred to the food inspectors for detailed investigation, as before Where contacts are employed at food places they are not permitted to return to work until three fæces specimens have been found negative It was recently noted that all the employers concerned were in favour of this practice and were willing to pay their employees for the time so lost

The food inspectors are thus receiving hourly reports from the field investigators and they in turn consult with the medical officer of health and the senior bacteriologist At short intervals all the members of the team meet to report progress and to receive further instructions At every stage the whole investigation is under strict bacteriological control At the same time instruction of the staff and management of all food premises involved in the methods of protection of foodstuffs from infection is undertaken Experience has shown that such instruction is welcomed

Summary

In an epidemic of paratyphoid B in Bristol the vehicle was artificial cream infected by a person who was a carrier and later became a case

Certain conditions must be present before an epidemic will arise from a food They are a carrier or early case handling a suitable vehicle, such as artificial cream, suitable external climatic conditions, such as high external summer temperature, and imperfect storage of the food, giving a favourable opportunity for incubation

In investigating an epidemic of food-poisoning there must be complete teamwork between the bacteriologist, epidemiologist and their field workers, with frequent meetings of the investigating teams

The best method of bacteriological control of epidemics of paratyphoid B is by examination of the fæces, Widal testing will miss large numbers of cases in the early stage Bacteriological examination must also be made of the fæces of all contacts and also of people engaged in handling food, since food-handlers are often in intimate contact with the food

The management of all food factories must be impressed with the importance of strict cleanliness among food-handlers Adequate washing arrangements and clean linen must be provided with precise instructions for using such facilities

In trying to discover a common food factor exhaustive food lists must be issued to the households of suspected cases, and the family must have time for considering such lists Verbal inquiry of members of the family is not enough

Notification of disease, bacteriological and epidemiological control should be centralised for rapidity of action

We thank Prof R H Parry for permission to publish this paper and Dr A Felix, of the National Institute for Medical

---

[2] See *Lancet*, 1940, ii, 778.

Table I shows that in 23 cases we were able to ascertain with some accuracy the actual date on which the artificial cream was eaten, and from the known dates of onset to calculate the incubation period in each case This varied from 4 to 19 days, with a mean of 12 days. With such a short series this is not a good statistical mean, but it is significant that in the graph of the dates of onset the distance from Aug. 3 to the peak Aug 15 is also 12 days, and that the number of primary cases falls symmetrically on either side of this peak date In all these cases we know the dates on which the cream was purchased , but there is an additional fact in connexion with cases 33 and 68 which allows us to draw a significant conclusion In these two cases it so happened that the pastries were purchased on Aug 2 for consumption at a party to be held on Aug 7 They were consumed on this latter day and it is noteworthy that these are the two shortest incubation periods (4 and 6 days respectively) found in the series This suggests that as a result of the incubation of the infected cream for 5 days a massive infection had resulted, thus shortening the incubation period in the two persons infected

TABLE I—INCUBATION PERIODS

Case	Cream consumed	Onset	Incubation period (days)	Case	Cream consumed	Onset	Incubation period (days)
1	Aug 2	Aug 10	8	50	Aug 2	Aug 13	11
2	,, 4	,, 11	7	68	,, 7	,, 13	6
3	,, 2	,, 10	8	84	1	,, 13	12
6	July 31	,, 11	11	95	July 16	,, 14	19
7	Aug 2	,, 14	12	119	Aug 2	,, 20	18
20	,, 2	,, 15	13	126	,, 8	,, 15	7
21	,, 5	,, 15	10	139	,, 6	,, 18	12
28	,, 2	,, 15	13	159	July 30	,, 6	7
29	July 26	,, 11	16	169	26	,, 11	16
33	Aug 7	,, 11	4	205	Aug 2	,, 20	18
38	,, 1	,, 14	13	218	July 28	,, 11	14
41	,, 2	,, 15	13				

On Aug 2, X Y took home cream buns from firm A, which she shared with some members of the family with whom she was living , a case occurred in this family It is reasonable, then, to suppose that throughout the latter part of July she was probably intermittently infecting the cream with small doses and during the holiday week-end reinfected herself with a massive dose This dose was sufficient to overcome the immunity necessary for her carrier state and so she became a clinical case There is much evidence in the published work on enteric infection to suggest that this sequence of events does occur Auto-infection of typhoid carriers has been reported, despite the difficulties of obtaining conclusive proof of such happening [1]

The higher proportion of ambulant cases usually found in paratyphoid as compared with typhoid probably means that auto-infection is more common in paratyphoid B Provided the time, temperature and medium are suitable for multiplication of organisms, an initially light infection by an ambulant case or carrier might result in such a massive dose that the low immunity of the carrier himself is overcome Since such patients make their appearance as fresh cases they are regarded as victims of the epidemic, when they may really have been a cause Investigation of firms B and C at which X Y had worked after Aug 2 revealed nothing Only one case was doubtfully attributed to this place, despite the fact that X Y was known to be excreting *Bact paratyphosum B* at this time On the other hand, she was doing different work—mainly preparing chocolate shortbread which was probably not such a good medium for infection as artificial cream In spite of exhaustive inquiry she could not be connected with any previous case in Bristol or elsewhere

There is evidence that in every population there is a pool of *Bact paratyphosum B* carriers who may be sparse intermittent excretors , and an explosive outbreak will certainly arise when the following conditions are simultaneously present a carrier , a suitable vehicle with opportunity for the carrier to infect this vehicle , high external summer temperature , favourable opportunity for incubation of the infected vehicle, such as imperfect storage All these conditions were present in this break

The evidence is very strong that X Y was the cause of the outbreak, but further considerations arise as to how she became a carrier Was she herself infected while serving her apprenticeship at the bakery before July 10 ? We can throw little light on this except for one rather inconclusive point during September, infections were found in people who had eaten cakes from the bakery at which X Y served her apprenticeship No case which could be attributed to this firm had occurred before Sept 1st The bakery was fully investigated but no-one working there showed any evidence of infection There is a slight possibility however, that someone at this firm had been a sparse intermittent carrier and had passed the infection on to X Y , but because the necessary conditions were not all present this problematical unknown had not succeeded in doing what X Y subsequently did when conditions were favourable for producing an outbreak.

Between Sept 18 and Oct 14, a further 9 cases were discovered which had consumed food from a confectioner's shop in the city No connexion between this shop and these 9 cases and the larger outbreak could be traced but the daughter of the owner of the shop had been ill for 3 weeks with an illness alleged to be influenza, and which we showed to be paratyphoid B She had been serving in the shop every Saturday before her illness and was probably the cause of the other cases No member of the staff of this shop showed evidence of infection Again, it is probable that this girl had not succeeded in producing a large outbreak because what we regard as the four primary conditions were not present

EPIDEMIOLOGY

Of the 244 established cases of paratyphoid, 149 (61%) were traced to known sources of infection , that is to say they either consumed food material which was known to be infected or were in intimate contact with a known case of paratyphoid at the time when they were infected Of the remaining 95 untraced infections, 65 began during the primary wave of the epidemic and had a similar range of onset dates and a similar peak, the maximum number of onset dates occurring on Aug 15 Thus in all probability these cases at least directly resulted from the infected material sold on the bank holiday week end

A number of strains of paratyphoid organisms isolated from cases arising both in the primary wave and from the various sources of infection after that were examined by Mr A Felix, D Sc , who reports that they are all of the same phage type Although this agrees with the argument that the strains have arisen from one single source it is not proof of this, since the particular type (type 1) is at present common throughout the country

TABLE II—AGE AND SEX DISTRIBUTION

Age group (year)	Cases in each group			% of series	Age group (year)	Cases in each group			% of series
	M	F	Total			M	F	Total	
0– 5	16	27	43	17 6	41–45	2	9	11	4 5
6–10	11	17	28	11 5	46–50	1	5	6	[illegible]
11–15	13	19	32	13 1	51–55	0	2	2	[illegible]
16–20	15	35	50	20 5	56–60	0	1	1	[illegible]
21–25	6	17	23	9 4	61–65	0	2	2	[illegible]
26–30	3	8	11	4 5	over 70	2	3	5	[illegible]
31–35	3	12	15	6 2					
36–40	4	11	15	6 1	Totals	76 (31%)	168 (69%)	244	10

M = Male , *F* = Female

Table II shows the age- and sex-distribution of cases it will be noted that the age-groups under 20 account for 62 7% of the total cases, and that slightly over two thirds of the cases were females Only 7 (2 9%) were nursed at home, and there were 2 (0 8%) deaths in the whole series

The city was divided for investigation purposes into six divisions and the percentage of cases in each division was as follows

Division 1	30 2%	Division 4	6
,, 2	29 4%	,, 5	1
,, 3	18 7%	,, 6	0

It is noteworthy that division 6 ha [illegible] cases and not served by firm A or any of its the twenty-third day it is unlikely that many bacilli e passing from the blood sinusoids into the bile aliculi One may conclude that their presence was to proliferation within the bile canaliculi during life l yet the immediately adjacent liver cells show no ognisable lesions other than some fatty infiltration is absence of damage to the liver cells has been cribed by MacCallum,[4] who also drew attention to relative absence of bacilli from the focal necroses It would thus seem that the focal necroses in paraphoid B, as in typhoid, arise within clumps of macro ages and are not due to a local proliferation of bacilli e bacilli, even in the acute stage of the disease, do not m capable of producing direct necrosis of the organs ey invade In convalescence the macrophage response the tissues subsides and it is doubtful whether any more croses develop The beneficial effect of removal of a eased gall-bladder in eradicating the carrier state may taken to indicate either that the focus of infection been removed, or, as seems to me more likely, that established chronic inflammation or obstruction may rfere with the free drainage of bile and of the coned bacilli But there is little evidence that the tinued presence of the bacilli within the liver of an nune carrier is harmful to the carrier himself ther histological studies of the liver in enteric carriers desirable

---

[1] Ledingham, J C G , and Arkwright, J A (1912) The Carrier Problem in Infectious Disease, London, pp 77 and 150 , Wilson, J S *J Hyg* , *Camb* 1938, 38, 508

SUMMARY

The autopsy findings are reported in a patient dying m paratyphoid B on the twenty-third day Evidence adduced to support the view that the focal necroses gin in clumps of macrophages and that the paratyphoid cilli do not directly attack the parenchymatous cells the organs It is suggested that in the carrier state presence of bacilli in the tissues is not directly harmful the carrier

My thanks are due to Dr B A Peters, medical superintendent of Ham Green Fever Hospital, for use of the clinical tes and to Mr T J H Cooke for the photographs

---

BACTERIOLOGY OF EPIDEMIC PARATYPHOID FEVER

IN LIVERPOOL

H. D Holt,
RCS, DPH, DIP BACT
ASSISTANT BACTERIOLOGIST TO THE CORPORATION OF LIVERPOOL

A C T Vaughan,
M B LPOOL
ASSISTANT LECTURER ON BACTERIOLOGY TO THE UNIVERSITY OF LIVERPOOL

H D Wright, M D, D SC EDIN, M R C P E
PROFESSOR OF BACTERIOLOGY IN THE UNIVERSITY, AND BACTERIOLOGIST TO THE CITY

THE recent extensive outbreak of paratyphoid B fever and around Liverpool has afforded a further opporunity of studying the value of examination of the fæces the diagnosis of this disease and the rate of elimination the infecting organism Previous reports from this boratory (Jones 1936, Glass and Wright 1937, Tabet 938, Glass and Tabet 1938) have indicated that enrichent by incubation for 18–24 hours in tetrathionate roth followed by plating on a selective solid medium ffords a method of laboratory diagnosis which is highly fficient and easy to apply We have found it almost npossible to popularise among practitioners the wellried and highly efficient method of blood-culture, and uch specimens as have been submitted have often been nsatisfactory, but it has proved easy to obtain fæcal pecimens and as a result a relatively large number of ases have been examined in the first week of the disease nd practitioners have more readily undertaken the nvestigation of family contacts The remarkable electivity of the method is also valuable in the detection f carriers during convalescence, and its ease of applicaion enabled us to deal with several thousand specimens uring this epidemic with a speed and certainty that ould not have been possible by the older methods

TECHNIQUE

Specimens of fæces were sent without diluent in sterile glass essels or in new waxed cardboard containers which had not been sterilised One local authority to whom these were not available used ordinary diphtheria swabs well steeped in the fæces Immediately on receipt a large (5 mm) loopful of solid, or 2–3 loopfuls of liquid, fæces were rubbed up in tetrathionate broth If possible a loopful (5 mm) of this suspension was immediately plated on one of the solid media, more often at the height of the epidemic this was omitted and the tetrathionate broth was incubated overnight and then subcultured to brilliant green eosin agar or Tabet's modification of the medium of Wilson and Blair (1931) On the following day suspicious colonies were identified by slide agglutination and subcultured for confirmation For convalescents and carriers enrichment was invariably used Specimens of urine were treated similarly, 1 c cm being added to 5–10 c cm. of tetrathionate broth, incubated overnight and then plated on one of the selective media

Tetrathionate broth was prepared by adding 10 c cm of a 60% solution of sodium thiosulphate and 5 c cm of a 30% solution of iodine in 25% potassium iodide to 90 c cm. of broth (Wright 1933) containing 2 5% of chalk (Schafer 1934–35) It is important to add the thiosulphate before the iodine and advisable to sterilise the chalk in the broth. Experimentally we have found these concentrations highly suitable for *Bacterium paratyphosum B*, but for *Bact. typhosum* it is perhaps better to use a 50% solution of thiosulphate and a 25% solution of iodine (Muller 1923) The medium was dispensed in 5–10 c cm quantities in tubes measuring 6 in by $\frac{5}{8}$ in and stored at room temperature in the dark Its selectivity appears to remain unaltered for a week and declines very little up to two weeks, thereafter it is less satisfactory If the medium is stored in the refrigerator a precipitate may form The optimum quantities of thiosulphate and iodine vary slightly with the basal medium used and selectivity seems to be better with slightly alkaline (pH 7 6) than with neutral or acid media The amounts of thiosulphate mentioned are in large excess of the amount required to combine with the iodine present and should not be exceeded. They may perhaps with advantage be reduced

Brilliant green eosin agar was prepared as described by Jones, though in the titration of batches of dye we have now found it advisable to fix the amount of eosin and vary the brilliant green We have also found that certain batches of dye, particularly of eosin, are unsuitable [1]

Tabet's medium (modified from that of Wilson and Blair) was prepared as described by him We find it better not to use this medium on the day on which it is prepared, and to discard it after it begins to turn green Usually it is perfectly satisfactory for at least a week Some non-pathogenic organisms will grow in tetrathionate broth, and therefore it is advisable to use a selective solid medium for subculture

DIAGNOSTIC CULTURES

In all, the laboratory was asked to help in the diagnosis of 481 cases From 7 no fæces were received but the result of the Widal was quite conclusive Of the remaining 474, 6 proved later not to be suffering from paratyphoid fever and specimens from 2 were not received until late in convalescence There were thus 466 cases from whom specimens were received on one or more occasions in reasonable time From 448 (96%) *Bact. paratyphosum B* was isolated from the fæces under such conditions as to confirm the diagnosis, 8 of the remaining 16 cases were subsequently proved elsewhere to be paratyphoid infections In 7 others we isolated *Bact. paratyphosum B* from the urine or fæces late in the disease but under such conditions that we believe they came, not from the patient but from the receptacles into which the excreta were received In the remaining case the Widal reaction was suggestive of an infection with *Bact typhimurium*

These results were satisfactory, but the positive cultures were not all obtained at the first attempt In 139 cases confirmed by culture we have information of the approximate date of onset of the symptoms and of the day on which the fæces were examined (table I) In 102 of these 139 cases (92%) the fæcal culture was positive at the first attempt, in 32 (7%) at the second and in 5 (1%) at the third In proved cases the percentage of positive cultures is high and similar in each of the first four weeks This bears out our previous suggestion that the prevalent idea that the organisms are not so readily found in the fæces in the first week as later requires

---

MacCallum, W G A Text book of Pathology, London, 1936
557

[1] Satisfactory preparations are held in reserve by Imperial Chemical Industries Ltd

Research, for phage typing a number of the paratyphoid strains The Health Committee of the city of Bristol, and the Medical Officer of Health gratefully acknowledge the help of the Harvard team of the American Red Cross Hospital, who provided a medical officer, two bacteriologists, six trained fever-hospital nurses and six field investigators during the whole period of the outbreak Our thanks are also due to Dr J E Gordon director of the American Hospital, for his help

---

A FATAL CASE OF PARATYPHOID B INFECTION

DEVELOPMENT OF THE CARRIER STATE

T F HEWER, M D BRIST, M R C P
PROFESSOR OF PATHOLOGY IN THE UNIVERSITY OF BRISTOL

IN the Bristol epidemic of paratyphoid B reported by Drs Davies, Cooper and Fleming[1] there were two deaths One was a child who developed paratyphoid while in hospital for Pfeiffer's bacillus meningitis, and on whom no autopsy was performed The other was a woman whose illness terminated with intestinal hæmorrhage and whose autopsy findings are reported here

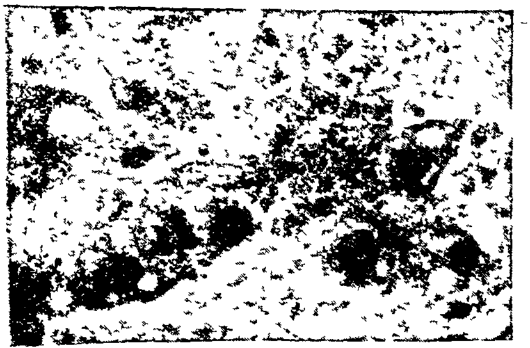
CASE-REPORT

A woman, aged 37, had headache dating from Aug 13, 1941, and subsequent diarrhœa and abdominal pain The appearance of a few rose spots on the abdomen led to her admission to hospital on Aug 22 The Widal reaction was positive for *Bacterium paratyphosum B* (H) 1/2500+ and (O) 1/50 Culture of stools was positive Gross hæmorrhage appeared first per rectum on the 31st, and she became drowsy with falling blood pressure and hæmoglobin until her death on Sept 1 the twenty third day of her illness

The autopsy was performed six hours after death A salient feature of the gross examination was extensive ulceration of the whole length of the colon, from the cæcum to the rectum Ulceration of Peyer's patches in the ileum was less severe In places large areas of mucosa were entirely denuded from the colon and many small vessels had evidently contributed to the hæmorrhage which filled the large bowel with clotted blood Some of the ulcers reached the musculosa but there was no danger of perforation and a little hyperæmia of the serosa was the only external indication of the severe disease within Apart from general enlargement of the mesenteric lymph nodes and the characteristic typhoid splenomegaly the only gross feature was the presence of half a dozen small cholesterol and pigment gall stones that had clearly been formed before this illness

Bacteriology —A culture taken from the contents of the gall bladder gave a pure growth of *Bact paratyphosum B*

Histology —Two points of interest arose in the histological study of the case the distribution of bacilli in the organs, and the mode of formation of the focal necroses The wall of the gall bladder was not inflamed and careful search revealed no bacilli within the mucosa, though some were seen on the surface In the liver enormous numbers of bacilli were found lying in the bile canaliculi between the columns of liver cells (fig 1) but there was neither necrosis nor cellular reaction alongside them This finding, together with the remarkable absence of bacilli within the focal necroses in the liver, suggest that bacilli may grow within the liver without necessarily producing any local lesions A lo search was required to discover any bacilli in the spl pulp or in the bone marrow in spite of the pre numerous focal necroses, and only an occasional collection of organisms was found in the interstitial of the kidney Focal necroses in different sta development were found in the liver, and one co clearly (fig 2) that they arose in clumps of macroph cells filling blood sinusoids The adjacent liver cells be necrotic secondarily, and the absence of bacilli within t necroses suggested that direct bacterial action on the liver wa not responsible for the lesions The clumps of macroph were held together in part by a meshwork of fibrin, and it w within them that the earliest signs of necrosis were fou Focal necroses in the spleen and bone marrow and in th inflamed lymphoid follicles of the bowel and mesenteric lymph nodes apparently arose in like manner



external summens in bile canaliculi between the liver for incubation of the methyl green pyronin stain

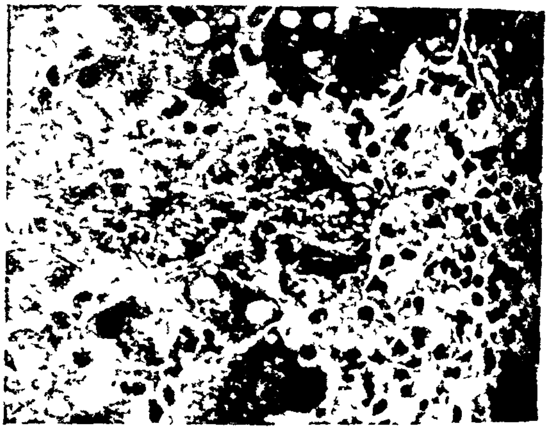


FIG 2—Early focal necrosis of liver A sinusoid i blocked with macrophages undergoing necrosis Dark stra of fibrin are seen in the centre Masson's trichrome (× 400)

DISCUSSION

Nichols[2] showed that typhoid bacilli in circulation the blood-stream pass from the liver sinusoids into th bile canaliculi and so appear in the bile, and it is genera held that the organisms may continue to prolifera within the intrahepatic bile-channels as well as in t wall and lumen of the gall-bladder In chronic ent carriers the occurrence of gall-stones and cholecystit well recognised, and cholecystectomy has often be performed to end the carrier state In some of th cases where millions of typhoid bacilli were found in t contents of the gall-bladder, careful histological examination of its wall has failed to show any lesions that can b attributed to typhoid rather than to gall-stones T led Garbat (quoted by Browning[3]) to express the vi that the carrier state in such cases is maintained by gall-bladder acting as "a test-tube containing the medium in which the typhoid bacteria propagate witho affecting the gall-bladder itself"

There is also evidence that biliary infection ma persist in the absence of the gall-bladder This see to be established by the case of congenital absence of th gall-bladder in a typhoid carrier recorded by Zarzyck (quoted by Browning), in this case there were calcu in the bile-ducts Browning concluded from a s of reported cases that cholecystectomy effects a cure 75% of intestinal carriers, in the remainder one assume that the bacilli continued to proliferate in bile-ducts or in the bowel, and one would like to know, the former case especially, whether and to what exte the presence of bacilli is harmful to the carrier

In the case of active paratyphoid now reported great number of bacilli in the bile canaliculi cannot entirely due to post-mortem proliferation, since autopsy was performed six hours after death and v few bacilli could be found in other organs, in spite of presence in them of numerous focal necroses No blo culture was made but since there was a high agglutin titre on the tenth day of the disease and death on the twenty-third day it is unlikely that many bacilli were passing from the blood sinusoids into the bile canaliculi One may conclude that their presence was due to proliferation within the bile canaliculi during life and yet the immediately adjacent liver cells show no recognisable lesions other than some fatty infiltration This absence of damage to the liver cells has been described by MacCallum,[4] who also drew attention to the relative absence of bacilli from the focal necroses

---

[1] Ledingham, J C G, and Ar and Fleming, D S Problem in Infectious Di Wilson, J S *J Hyg*, Car

[2] Nichols, H J *J exp Med* 1916, 24 497

[3] Browning, C H *Spec Rep Ser med Res Coun Lond* No 1933 p 13

It would thus seem that the focal necroses in paratyphoid B, as in typhoid, arise within clumps of macrophages and are not due to a local proliferation of bacilli The bacilli, even in the acute stage of the disease, do not seem capable of producing direct necrosis of the organs they invade In convalescence the macrophage response in the tissues subsides and it is doubtful whether any more necroses develop The beneficial effect of removal of a diseased gall-bladder in eradicating the carrier state may be taken to indicate either that the focus of infection had been removed, or, as seems to me more likely, that an established chronic inflammation or obstruction may interfere with the free drainage of bile and of the contained bacilli But there is little evidence that the continued presence of the bacilli within the liver of an immune carrier is harmful to the carrier himself Further histological studies of the liver in enteric carriers are desirable

SUMMARY

The autopsy findings are reported in a patient dying from paratyphoid B on the twenty-third day Evidence is adduced to support the view that the focal necroses begin in clumps of macrophages and that the paratyphoid bacilli do not directly attack the parenchymatous cells of the organs It is suggested that in the carrier state the presence of bacilli in the tissues is not directly harmful to the carrier

My thanks are due to Dr B A Peters, medical superintendent of Ham Green Fever Hospital, for use of the clinical notes and to Mr T J H Cooke for the photographs

---

BACTERIOLOGY OF EPIDEMIC PARATYPHOID FEVER

IN LIVERPOOL

H. D HOLT,
M.R C.S , D P H , DIP BACT
ASSISTANT BACTERIOLOGIST TO THE CORPORATION OF LIVERPOOL

A C T VAUGHAN,
M B LPOOL
ASSISTANT LECTURER ON BACTERIOLOGY TO THE UNIVERSITY OF LIVERPOOL

H D WRIGHT, M D , D SC EDIN , M R C P E
PROFESSOR OF BACTERIOLOGY IN THE UNIVERSITY, AND BACTERIOLOGIST TO THE CITY

THE recent extensive outbreak of paratyphoid B fever in and around Liverpool has afforded a further opportunity of studying the value of examination of the fæces in the diagnosis of this disease and the rate of elimination of the infecting organism Previous reports from this laboratory (Jones 1936, Glass and Wright 1937 Tabet 1938, Glass and Tabet 1938) have indicated that enrichment by incubation for 18–24 hours in tetrathionate broth followed by plating on a selective solid medium affords a method of laboratory diagnosis which is highly efficient and easy to apply We have found it almost impossible to popularise among practitioners the well-tried and highly efficient method of blood-culture, and such specimens as have been submitted have often been unsatisfactory , but it has proved easy to obtain fæcal specimens and as a result a relatively large number of cases have been examined in the first week of the disease and practitioners have more readily undertaken the investigation of family contacts The remarkable selectivity of the method is also valuable in the detection of carriers during convalescence, and its ease of application enabled us to deal with several thousand specimens during this epidemic with a speed and certainty that would not have been possible by the older methods

TECHNIQUE

Specimens of fæces were sent without diluent in sterile glass [illegible]s or in new waxed cardboard containers which had not been sterilised One local authority to whom these were not available used ordinary diphtheria swabs well steeped in the fæces Immediately on receipt a large (5 mm) loopful of solid, or 2–3 loopfuls of liquid, fæces were rubbed up in tetrathionate broth If possible a loopful (5 mm) of this suspension was immediately plated on one of the solid media , more often at the height of the epidemic this was omitted and the tetrathionate broth was incubated overnight and then subcultured to brilliant green eosin agar or Tabet's modification of the medium of Wilson and Blair (1931). On the following day suspicious colonies were identified by slide agglutination and subcultured for confirmation. For convalescents and carriers enrichment was invariably used Specimens of urine were treated similarly, 1 c cm being added to 5–10 c cm. of tetrathionate broth, incubated overnight and then plated on one of the selective media

Tetrathionate broth was prepared by adding 10 c cm of a 60% solution of sodium thiosulphate and 5 c cm of a 30% solution of iodine in 25% potassium iodide to 90 c cm. of broth (Wright 1933) containing 2 5% of chalk (Schafer 1934–35) It is important to add the thiosulphate before the iodine and advisable to sterilise the chalk in the broth. Experimentally we have found these concentrations highly suitable for *Bacterium paratyphosum B*, but for *Bact. typhosum* it is perhaps better to use a 50% solution of thiosulphate and a 25% solution of iodine (Muller 1923) The medium was dispensed in 5–10 c cm quantities in tubes measuring 6 in by $\frac{5}{8}$ in and stored at room temperature in the dark Its selectivity appears to remain unaltered for a week and declines very little up to two weeks , thereafter it is less satisfactory If the medium is stored in the refrigerator a precipitate may form The optimum quantities of thiosulphate and iodine vary slightly with the basal medium used and selectivity seems to be better with slightly alkaline (pH 7 6) than with neutral or acid media The amounts of thiosulphate mentioned are in large excess of the amount required to combine with the iodine present and should not be exceeded. They may perhaps with advantage be reduced

Brilliant green eosin agar was prepared as described by Jones, though in the titration of batches of dye we have now found it advisable to fix the amount of eosin and vary the brilliant green. We have also found that certain batches of dye, particularly of eosin, are unsuitable [1]

Tabet's medium (modified from that of Wilson and Blair) was prepared as described by him We find it better not to use this medium on the day on which it is prepared, and to discard it after it begins to turn green Usually it is perfectly satisfactory for at least a week Some non-pathogenic organisms will grow in tetrathionate broth, and therefore it is advisable to use a selective solid medium for subculture

DIAGNOSTIC CULTURES

In all, the laboratory was asked to help in the diagnosis of 481 cases From 7 no fæces were received but the result of the Widal was quite conclusive Of the remaining 474, 6 proved later not to be suffering from paratyphoid fever and specimens from 2 were not received until late in convalescence There were thus 466 cases from whom specimens were received on one or more occasions in reasonable time From 448 (96%) *Bact. paratyphosum B* was isolated from the fæces under such conditions as to confirm the diagnosis , 8 of the remaining 16 cases were subsequently proved elsewhere to be paratyphoid infections In 7 others we isolated *Bact. paratyphosum B* from the urine or fæces late in the disease but under such conditions that we believe they came, not from the patient but from the receptacles into which the excreta were received In the remaining case the Widal reaction was suggestive of an infection with *Bact typhimurium*

These results were satisfactory, but the positive cultures were not all obtained at the first attempt In 439 cases confirmed by culture we have information of the approximate date of onset of the symptoms and of the day on which the fæces were examined (table I) In 402 of these 439 cases (92%) the fæcal culture was positive at the first attempt in 32 (7%) at the second and in 5 (1%) at the third In proved cases the percentage of positive cultures is high and similar in each of the first four weeks This bears out our previous suggestion that the prevalent idea that the organisms are not so readily found in the fæces in the first week as later requires revision Of the 213 cases found positive in the second week, only 11 had been examined in the first On the other hand, it was possible to diagnose 121 cases at the first attempt in the first week and one at the second The number of cases in this series is large and justifies the conclusion that fæcal examination for the diagnosis of paratyphoid B fever should be undertaken as early as possible, and if not successful should be repeated at least twice within the next few days We have no similar experience of typhoid or paratyphoid A fevers and we realise that *Bact typhosum* at least is more fastidious, but we believe that the results in these might not be dissimilar If these methods fail the Widal test remains available, at least in the uninoculated person

---

[4] MacCallum W G A Text book of Pathology, London, 1936 p 587

[1] Satisfactory preparations are held in reserve by Imperial Chemical Industries Ltd

In a number of our cases, especially from the urine of female patients, we have isolated *Bact paratyphosum B* late in the course of the disease after a series of negative cultures Bumke (1925–26) refers to such occurrences and we have had similar experiences previously (Glass and Wright 1937) Bumke regards this late appearance of organisms and their irregular occurrence as a genuine feature of certain cases At first we thought this might be so, but our present view is that such findings are often due to contamination of excreta arising from inadequately sterilised receptacles or some other source not always easy to trace If fæcal cultures are to be relied on the collection of specimens must be entrusted only to instructed persons who appreciate the dangers

TABLE I—RESULTS OF FÆCAL EXAMINATIONS IN THE FIRST 6 WEEKS OF PARATYPHOID B FEVER

Week	Cultures +	Culture – but later +	Cultures + (%)
1	122	15	89
2	213	22	91
3	68	2	97
4	24	3	89
5	9	0	
6	3	0	
Total	139	42	

This epidemic was very mild, 6 deaths in all being reported in about 500 cases, only 2 of these occurred in patients who were not suffering from some other disease as well Many patients suffered from little more than a mild enteritis and might well have been ambulant, yet the organism was easily found In a certain confectionery and bakery suspected of disseminating the infection it was necessary to examine some 200 employees in the course of a search for carriers and ambulant cases The serum was examined for agglutinins for *Bact paratyphosum B*, H and O, and for the salmonella group From 53 persons whose serum agglutinated one or other of these suspensions at or above a dilution of 1 in 25, one or more, usually two, specimens of fæces were examined *Bact paratyphosum B* was isolated from 10 of these employees, only 2 of them were at the time considered sufficiently ill to be confined to bed No chronic carrier was found and none of these persons became a chronic carrier Any part played by this firm in distributing infection may well have been due to unrecognised and ambulant cases and to temporary carriers who became infected early in the epidemic and happened to be so employed as to disseminate infection easily This sort of history has characterised many recent epidemics of paratyphoid B fever and it emphasises the importance of adequate study of sporadic cases and of the search for ambulant cases in contact with them It also brings out the importance of the hygienic conditions in such establishments Paratyphoid bacilli were isolated from two samples of synthetic cream

DURATION OF INFECTION IN THE EXCRETA

We have previously reported our findings on the persistence of fæcal infection in 98 cases of paratyphoid B fever (Glass and Wright 1937) In a recent epidemic in Bristol, Davies and his colleagues (1940) found that the rate of clearance was much quicker In the present study it was not possible to arrange for the weekly examination of all patients Specimens were sent in as clinical considerations demanded, and often very irregularly We have recorded all findings and determined the latest day of the disease on which the organism was found in the fæces before three successive negatives, assuming that clearing occurred in the following week The figures for the first three or four weeks may be highly erroneous, for once the diagnosis had been confirmed it was usual to allow three weeks to elapse before submitting other specimens, those for the fourth and subsequent weeks are probably more accurate The large numbers have permitted us to consider the effect of age and sex on the rate of clearing (table II)

TABLE II—RATE OF DISAPPEARANCE OF *Bact paratyphosum B* FROM THE FÆCES

Week of disease	Percentage still excreting *Bact paratyphosum B* in fæces									
	Whole series (339)	M (138)	F (201)	M under 20 (121)	F under 20 (126)	F 20 and over (75)	Treated (40)	Controls untreated (18)	Liverpool 1937 (98)	Bristol
1	100	100	100	100	100	100	100	100	*	83
2	92	88	94	88	96	91	93	97	100	[illegible]
3	81	78	84	77	86	79	93	88	93	64
4	73	65	78	64	78	77	85	78	88	[illegible]
5	61	54	66	51	68	61	65	74	84	[illegible]
6	44	39	47	38	48	47	40	53	67	[illegible]
7	31	27	33	26	31	37	30	36	49	[illegible]
8	22	20	23	19	18	32	28	27	33	
9	15	14	15	14	8	31	20	17	19	
10	10	8	11	7	4	23	10	11	15	
11	9	7	10	7	4	20	10	11	9	
12	7	4	9	3	2	20	5	6	7	
13–16	6	2	8	2	2	19	2 5	6		
over 16	5	1	7	0	2	17	0	6	4	

Total cases in each group are shown in parentheses
Males (M) 20 years and over (17 cases) not tabulated separately, 1 still + after 16 weeks
* Only 6 cases examined in first week

The rate of clearance is distinctly faster for our whole series than that of the 1937 epidemic but not nearly so fast as that of the Bristol series Possibly the rate is associated with the severity of the epidemic, but this is mere conjecture In 1937 the case fatality was 9% (Frazer et al 1937) whereas in this epidemic it was about 1% A large series such as ours is more likely to give correct figures than the smaller series of 1937 The clearance rate is a little slower for females than for males and the rate for females under 20 a little slower initially than that for males under 20, the numbers in each group being sensibly the same The females of 20 years and over provided much the slowest rate of all Even after 16 weeks, 17% of the 75 cases were still excreting paratyphoid bacilli in the fæces (table III)

TABLE III—AGE- AND SEX-DISTRIBUTION OF PROLONGED EXCRETORS OF PARATYPHOID BACILLI

Age (years)	Males		Females	
	Cases	Fæces + at 16 weeks	Cases	Fæces + at 16 weeks
Under 20	121	0	126	[illegible]
,, 20–29	7	0	37	[illegible]
,, 30–39	5	0	12	[illegible]
40 and over	5	1	26	9
All ages	138	1	201	15

Only one male (aged 52) still continued to excrete paratyphoid bacilli in the fæces after 16 weeks, as against 15 females, but the small number of males in the higher age-groups forbids any direct conclusions Of the females, 2 were little girls of 3 and 6 years, the remainder were married women, 9 of them 40 or more years of age out of 26 infected The ages of these 9 patients were 41 (2), 46 (2), 47, 50 (2), 51 and 53 years In the 18th week one woman, aged 32, ceased to excrete the organisms, the remainder are still under observation In our previous series 4 patients were still excretors after 1 weeks, but later 3 of them cleared up, the remaining one being still under observation nearly 5 years later as a chronic carrier We hope to be able to follow our present cases for some time longer to see if any of them cease to excrete the organism later Up to now there has been little evidence of real intermittency in the excretion but the period is not yet very long

The treated cases (table II) were given appropriate doses of sulphanilylguanidine (Marshall et al 1941

Anderson and Cruickshank 1941) by Dr P B Beeson, of the American Red Cross Harvard Field Hospital Unit There is little evidence that this had much influence on the rate of clearing The presence of 3 long-continued excretors in the untreated group may well have been fortuitous

We have not recorded our observations on the urine, largely because we felt that many of them were invalidated by contamination from receptacles In the whole series prolonged excretion in the urine was very uncommon. No persistent excretor now remains under observation though one young man of 19 did not cease to excrete until the 17th week his fæces having become negative in the 6th week. So far as we could determine, therefore, no patient became a chronic urinary carrier

DISCUSSION

In our previous paper (Glass and Wright 1937) we were unable, owing to the paucity of specimens, to decide if examination of the fæces was as valuable in the first week of paratyphoid B fever as in the later weeks Allowing for the uncertainty which naturally attaches to the date of onset in this disease, our experience confirms the view that examination of the fæces by the enrichment method recommended is of great value at all stages of the disease The most valuable part of the technique is, we believe, the use of tetrathionate broth, which is very easy to prepare, but the special plates are an additional help, and Tabet's medium is probably the simpler to make The method is equally applicable to the search for other salmonellas and for typhoid, but not to the diagnosis of dysentery As a routine technique we recommend examination of the fæces as early as possible in the disease, with or without blood-culture ; if the first attempt at fæcal culture fails another should be made at once, and if necessary a third With this technique we think that few cases will be overlooked and many unsuspected infections will be detected, especially among contacts The delicacy of the method makes it essential that the greatest care should be exercised in the sterilisation of receptacles used for collecting specimens In the home this may not be easy, and error may arise through a number of persons using the same receptacle for defæcation. We have found it helpful to give to each person a wide-mouthed screw-topped grease-proof cardboard tumbler into which he can defæcate directly.

The observations on the rate of clearing up of the infection in the intestine largely confirm and partly modify our earlier conclusions The high incidence of prolonged infection of the fæces in married women, especially in those over 40, is well illustrated It is early yet to speak of chronic carriers but one aftermath of this epidemic is that we are likely soon to have liberated in the community a number of persons whose fæces, after periods ranging from 16 to 23 weeks, are still heavily infected with paratyphoid bacilli; an event which it will be interesting to follow as opportunity offers

The epidemic of which these patients formed part was a very extensive one on both sides of the Mersey Of its ultimate origin we are still uncertain, but its great extent appears to have been due to contamination of synthetic cream We regard this contamination as an accident in the history of one or more persons who became infected in the early days of the epidemic, and whose occupation permitted them to infect 8 or more other persons in the same place of employment who again may have contributed their quota to the final result 2 of these early cases when detected were ill at home with conditions which were labelled gastritis but were actually paratyphoid · the other infected employees were detected while still at work · These facts emphasise the importance of bacteriological examination of even mild intestinal disturbances and of the search for carriers, temporary or chronic, and ambulant cases in the environment of established sporadic cases of enteric fever. It is clear too that the hygiene of the large bakery establishment requires most careful supervision, for such establishments have been concerned in the dissemination of infection in a number of recent paratyphoid epidemics

SUMMARY

The value of fæcal cultures in the diagnosis of paratyphoid fever has again been demonstrated in a group of 460 cases, 96% of which were confirmed in this way

The method was applicable at all stages of the infection, including the first week In 402 out of 439 cases (92%) cultures were obtained at the first attempt, in 32 (7%) at the second and in 5 (1%) at the third

The rate of clearing of fæcal infection was found to be particularly slow in women over 20 years of age. Of 26 women over 40 years, 9 continued to excrete paratyphoid bacilli in the fæces for more than 16 weeks

Attention is drawn to the importance of ambulant and unrecognised cases in the spread of infection and to the great importance of hygienic measures in the baking industry in relation to paratyphoid epidemics

We wish to thank practitioners and hospital medical officers who supplied us with information about their cases, our assistants, Mr W A Smith and Mr G H Kneale for their help with a large number of cultures , Dr B T J Glover, who placed his records of the epidemic at our disposal, and Dr P. B. Beeson for permission to use the figures relating to the cases treated with sulphanilylguanidine and the control group

REFERENCES

Anderson D E W and Cruickshank R. (1941) *Brit med J* ii, 497
Bumke, E (1925–26) *Z Hyg InfektKr* 105, 342
Davies, L G , Cooper, K. E , Wiseman, J and Davies, J M. (1940) *Lancet*, ii, 778
Frazer, W M., Glover, B T. J and Glass, V (1937) *Brit med J* ii, 369
Glass, V and Tabet, F (1938) *J Path Bact* 46, 195
— and Wright H D (1937) *Ibid*, 45, 431
Jones, E R (1936) *Ibid*, 42 455
Marshall, E K., Bratten, A C , Edwards, L B and Walker, E (1941) *Bull. Johns Hopk Hosp* 68 94
Muller L (1923) *C.R Soc biol. Paris* 89 434
Schafer, W (1934–35) *Zbl Bakt* 133 458
Tabet, F (1938) *J Path Bact* 46 181
Wilson, W. J and Blair, E M. McV (1931) *J Hyg* , Camb 31, 138
Wright, H D (1933) *J Path. Bact* 37, 257

STAPHYLOCOCCAL SEPTICÆMIA

RECOVERY WITH SULPHATHIAZOLE

W A. JACKMAN
M.B BRIST , F R.C S.E
COLONEL, LATE R.A.M.C

N H MARTIN,
B M. OXFD, M.R.C.P , F I C
MAJOR, R.A.M.C

PERIODICALLY reports appear of isolated cases of staphylococcal septicæmia successfully treated. We believe that such reports would be more valuable if they always contained an attempt at a quantitative estimate of the concentration of staphylococci present in the blood-stream We have made such an estimate and compared our findings with those previously recorded

CASE-HISTORY

A man, aged 24, was admitted to hospital on Jan 1, 1941 On Dec 28 he had squeezed a pimple on his upper lip Next day the pimple was worse and on the 30th he paraded sick before his medical officer When first seen at hospital, on the evening of Jan 1, four days after he had first noticed the pimple, he complained of severe pain behind the eyes and of feeling extremely ill He had a carbuncle involving the upper lip and spreading on to the nasal septum The surrounding tissues were red and indurated. His temperature was 103° F. and his pulse rate 120 He was put to bed, magnesium sulphate paste was applied locally and sulphapyridine, 4 g in the first 12 hours, was given by mouth At the end of 24 hours his general condition seemed worse though his temperature was falling The whole of his face was now œdematous His eyelids were swollen and closed; their superficial veins distended and turgid The sulphapyridine was being tolerated badly , he complained of nausea and was cyanosed and vomiting Intravenous administration of 2 g of sulphapyridine was tolerated no better and we were forced to abandon its use On the 6th day of illness (48 hours after admission) he complained of pain in the stomach and of persistent severe headache His face was more swollen, there was complete ptosis of both eyelids with thrombosis of the superficial veins of the left eyelid but no demonstrable proptosis. He was coughing up purulent blood stained sputum and his pulse was rapid and poor in quality A radiogram taken later confirmed the presence of pneumonia at the right base A swab taken from the carbuncle on the nose produced a pure growth of a hæmolytic *Staphylococcus aureus* which gave a positive coagulase reaction The predominant organism in the sputum was a staphylococcus having the same properties A culture of the patient's blood taken on the 6th day also grew coagulase positive hæmolytic

number had at any time exceeded 100 per ml death occurred in all but 2 in each of which the primary focus was so placed that it could be excised completely Our patient had a concentration of 110 colonies per ml There was no possibility of excising the primary focus If we accept Butler's experience as a measure, it seems reasonable to assume therefore that the treatment helped to save his life

The sulphathiazole and antitoxin were used in the first course of treatment because of the success we had had in the treatment of proved *Clostridium welchii* infections, using sulphapyridine and antitoxin The reports of Fenton and Hodgkiss (1938), Maxwell (1938), Corner (1940), and Butler (1940b) do not show that sulphathiazole is more effective in the treatment of staphylococcal infections than sulphapyridine, though some of these reports do not contain quantitative data for comparison We used sulphathiazole because sulphapyridine was not tolerated and because the patient's condition was deteriorating rapidly while it was used

As is traditional in dealing with infections of the upper lip we reduced local interference to a minimum Careful and continuous nursing with the maintenance of a high fluid intake were not neglected

We are grateful to Colonel R A Anderson, officer commanding the general hospital, and to Brigadier E C Beddows for permission to publish this case

REFERENCES

Butler E C B (1940a) *Brit J Surg* 28, 261, (1940b) *Proc R Soc Med* 33, 677

Corner, B D (1940) *Ibid* p 623

Fenton W J and Hodgkiss F (1938) *Lancet*, ii, 667

Maxwell, J (1938) *Ibid*, p 1233

NORMOBLASTIC CRISES AFTER AIR-RAID INJURY

J G HUMBLE, M R C S

(*John Burford Carlill Laboratories, Westminster Hospital*)

IN patients who have suffered severe blood loss, of the order of a litre or more, a profound degree of anæmia may be expected on restoration of the blood-volume, hæmoglobin values of 40% (Haldane) with 2 5 millions of red-blood cells per c mm are not uncommon among survivors Schiødt[1] has shown that restoration of the blood picture to normal takes approximately 30 days During recovery nucleated red cells may be found in the peripheral blood In three seriously wounded air-raid casualties, a shower of normoblasts and reticulocytes was found 7 days after the injury This "shower" lasted only a day and clinical and hæmatological recovery rapidly followed Seriously infected cases do not show this reaction unless the infection is rapidly terminated—for example, a reticulocytosis of 6 8% was seen 10 days after amputation for gas-gangrene

CASE 1—A girl of 19, injured on Nov 19, 1940 She had a compound fracture of the right elbow, amputation of the right foot, and other lacerations She received plasma and 720 c cm of blood On Nov 26 the blood count showed Hb 40% (Haldane), red cells 1,920,000 per c mm, white cells 15,400 per c mm, polymorphs 12,782 (83%), lymphocytes 1540 (10%), monocytes 924 (6%), eosinophils 154 (1%), the red cells showed a macrocytosis, with much polychromasia Hæmoglobinised normoblasts 3 per 100 white cells, normoblasts 8 per 100 white cells No reticulocyte count was done Next day only an occasional normoblast was found, reticulocytes 3% On Dec 3, Hb 48%, red cells 2,110,000 per c.mm In this case, the blood crisis occurred a week after injury

CASE 2—A woman of 30, injured on April 16, 1941 The injuries included compound fractures of the right femur and right humerus, simple fractures of the left tibia and the pelvis with intraperitoneal rupture of the bladder She received serum and 540 c cm of blood On April 24 the blood count was Hb 50%, red cells 2,470,000 per c mm, white cells 20,900 per c mm, polymorphs 19,646 (94%), lymphocytes 627 (3%), monocytes 209 (1%), eosinophils 418 (2%), normoblasts 2 per 100 white cells, reticulocytes 4 8%, some anisocytosis and much polychromasia were seen This case was complicated by "traumatic nephritis"

CASE 3—A man of 28, injured on April 17, 1941 The injuries included a simple fracture of the right tibia and bilateral perforating wounds of the anterior triangles of the neck On April 24 a blood count showed Hb 48%, red cells 2,350,000 per c mm, white cells 16,000 per c mm, polymorphs 11,840 (74%), lymphocytes 2080 (13%), monocytes 1600 (10%), eosinophils 480 (3%), an occasional myelocyte, plasma cell, and normoblast were found in the blood film, reticulocytes 2 2% Next day no normoblasts were found in the film on prolonged search Reticulocytes less than 1%

As a contrast to these three the following case is of interest

CASE 4—A man of 35, injured on May 11, 1941 The injuries included a subthoracic rupture of the left kidney and descending colon by a metallic fragment entering from behind. Nephrectomy was performed 2½ hours after wounding and colostomy 12 hours after wounding Serum and 540 c cm. of blood were given He rapidly developed "traumatic nephritis" The blood count of May 18 was Hb 48%, white cells 12,400 per c mm, polymorphs 10,788 (87%), lymphocytes 1240 (10%), monocytes 372 (3%), no normoblasts seen, reticulocytes less than 2% No red cell count was done On the 20th the blood count showed Hb 48%; red cells 2,000,000 per c mm, white cells 12,200 per c mm; polymorphs 10,980 (90%), lymphocytes 976 (8%), monocytes 244 (2%), no normoblasts seen, reticulocytes less than 2% At this time the renal failure ceased, and a pleural effusion, at first free from organisms but later purulent and containing gram negative bacilli (not culturable), developed Blood count on May 31 showed Hb 43%, red cells 2,140,000 per c mm, white cells 9100 per c mm, polymorphs 8917 (87%), lymphocytes 1001 (11%), monocytes 91 (1%), eosinophils 91 (1%), reticulocytes less than 2% no normoblasts seen He improved rapidly after rib-resection and drainage on June 9 On June 24 Hb 52% On July 21, Hb 73%, red cells 4,330,000 per c mm Here recovery was complicated by gross sepsis and blood regeneration was much delayed

All these cases made a good recovery The conclusions that can be drawn from them are that (1) normoblastic crises may be found after severe injury, (2) that they are not found in cases complicated by severe sepsis, and (3) that their appearance is of good prognostic significance

My thanks are due to Mr G H Macnab and Dr C J. Gavey for permission to abstract from the notes of patients under their care

PANCREATIC FISTULA IMPLANTED INTO THE STOMACH

HAROLD C EDWARDS M S LOND, F R C S

SURGEON TO KING S COLLEGE HOSPITAL

ON Jan 25, 1940, an obese man of 49 was admitted into King's College Hospital in extremis Eight days previously he had received a severe blow over the lower part of the chest, and he had suffered violent abdominal pain the next day, with one attack of vomiting The pain increased in severity as the days passed, and though there had been no recurrence of the sickness he had been unable to take anything by mouth. The bowel had acted freely, assisted by enemata

On admission the pulse rate was 130 and the temperature 99° F The skin was dusky and the patient was unable to give an accurate account of his immediate past history The abdomen was distended, and an ill-defined mass, dull to percussion, was felt in the epigastrium, reaching from the liver—and apparently continuous with it—to a point below the umbilicus No exact diagnosis was made, and an immediate exploration was decided on

First operation—On Jan 25, under local anæsthesia, a 2 in incision was made through the upper part of the linea alba, and continued through abundant and œdematous extraperitoneal fat The peritoneum was opened through a small incision, and a blunt dissector pushed forward into a fat-covered mass Immediately there was a rush of old, dark blood, which had been under tension and which poured from the wound in enormous quantities My notes say about 3 pints in all—but this was a pure guess When bleeding stopped, a large bore drainage tube was put down into a big cavity and the wound closed with two stitches taking in all layers

---

[1] Schiødt, F *Amer J med Sci* 1937, 193 313

The case excited much comment at the time—it was reminiscent of the fictitious operation in Cronin s "The Citadel" My own view then was that I had stumbled into a traumatic hæmorrhagic pancreatitis from which the patient had recovered sufficiently to enable him to localise the resulting necrosis Subsequent events showed this to be correct He was extremely ill at operation, and the temptation to explore the abdomen to satisfy my intense curiosity had to be resisted An unexpected good recovery followed In the 24 hours after operation 1050 c cm of urine was collected which showed a diastase index within normal limits (10 Wohlgemuth)

Three weeks later the patient was transferred to a sector hospital At the lower end of the small operation wound was the mouth of a large sinus, discharging sanious fluid containing a considerable amount of diastase, and surrounded by excoriated skin Sporing organisms of the *Bacillus subtilis* group were recovered from it

Two months later he returned to King's College Hospital He was up and about, and felt well except for attacks of epigastric pain with flatulence, but he had lost much weight The sinus had persisted, and discharged about 12 oz of clear fluid daily, which necessitated wearing a Hamilton Irving suprapubic box The discharge contained a high percentage of diastase (more than 2000 units per c cm) and a scant growth of *Staphylococcus albus* and *B coli* was obtained from it The gastric residuum, which contained blood, showed no free acid but a brisk response to histamine The stools contained a small amount of undigested muscle fibres and starch granules and an excess of unsplit fat X ray of the gall bladder showed a normal emptying rate, and a barium meal showed no abnormality of the stomach X ray of the sinus after lipiodal injection showed a long tortuous track leading to the left and passing beneath the fundus of the stomach The condition was therefore an established pancreatic fistula opening from the left side of the body of the pancreas

Second operation —On April 3, under gas oxygen ether (Dr F Cartwright), the sinus was first filled with paraffin wax, and, with a peroral margin of skin, dissected towards its origin from the pancreas The track proved to be a well-defined tube some 4½ in long , it ended near the tail of the pancreas, which was hard and swollen like a cricket ball Adhesions were dense and universal, and the dissection took some time but was helped by the presence of the paraffin wax Excision of the track appeared out of the question, and a fistulo gastrostomy was performed Ether was injected into the sinus to dissolve the wax, which shot out in pellets as the ether boiled in the lumen An incision was made in the anterior wall of the stomach, and the skin surrounding the mouth of the fistula sewn to the mucosa of the stomach with interrupted sutures of catgut A stab drain was put down to the site of the anastomosis and the abdomen closed in layers Convalescence was uneventful During the operation a collection of pultaceous material was found in the retroperitoneal fat, and pathological investigation showed this to have resulted from fat necrosis

Gastroscopy —On June 27 the patient returned to King's College Hospital at my request for gastroscopy He was well and had regained his weight (to an altogether unnecessary extent, I thought, for he was normally an obese man) He complained of no discomfort or pain , his appetite was good and he did not diet His bowel action was regular The gastric residuum contained bile, mucus and starch , the volume was 120 c cm , and there was 4 c cm N/10 free hydrochloric acid % No diastase was present Nothing abnormal was found in an examination of the stools I was extremely eager to examine the site of anastomosis with the gastroscope, and had remembered at the second operation to place the fistula where I knew it would come into the visual field I found the opening with some difficulty , it looked rather like an œdematous ureteric orifice Around it the gastric mucosa appeared to be atrophic There was no sign whatsoever of the skin which had originally surrounded the fistula It had been replaced entirely by gastric epithelium

In a letter dated Nov 11, 1940, the patient glories in his good health He works hard in his office, rising at 7 A M and retiring to bed between 9 and 10 P M His appetite is good—he eats all he can get

COMMENTARY

Chapman[1] has recently described a case in which a pancreatic fistula resulting from marsupialisation of a very large pancreatic cyst was successfully implanted into the jejunum, and raises the question whether anastomosis to the duodenum or jejunum is not superior to anastomosis with the stomach, owing to destruction of the pancreatic ferments by the gastric secretion after the latter operation In my own case it seemed that most of the pancreas was functioning and excreting normally, and that only a small part of it—towards the tail—was drained by the fistula The loss of such ferments as were produced by this portion as a result of interaction with the gastric secretion would probably be insufficient to affect the digestive functions materially

---

FOREIGN BODIES IN THE AIR-PASSAGES

H V MORLOCK,
M D LOND , F R C P
PHYSICIAN TO THE LONDON CHEST HOSPITAL

B G EDELSTON,
M D EDIN
TUBERCULOSIS OFFICER TO THE KENT COUNTY COUNCIL

THE maxim that "the customer is always right" may be *accepted in the best business circles , it is not* endorsed by the medical profession, probably because clinical practice has proved that it is unwise to accept any statement from a patient which cannot be confirmed by further examination of his history, physical signs or radiological and pathological reports Nevertheless, in cases where physical signs are slight or absent, it is equally unwise to discount the patient's history, particularly when dealing with uncommon condition

The aspiration of a foreign body into the tracheobronchial tree is a well-recognised accident, and the varied symptoms and pathological lesions which may result can be found in any textbook , but in this country it is a comparatively uncommon condition and English doctors are thus much less "foreign-bodyminded" than their colleagues in the United States, where the chewing habit makes the accident much commoner The following 4 cases show how hesitatingly the patient's unconfirmed word is accepted

CASE-RECORDS

CASE 1 —A woman of 53 gave her own doctor a history of having had an attack of dry pleurisy in 1936 , a second attack in 1940 , and a third attack in May, 1941 The temperature during this third illness had been in the region of 100° F and her doctor found signs at the left base suggesting a partial pneumothorax The X ray report said "typical pneumonic consolidation" She was then given a course of sulphapyridine (M&B 693) but this had to be discontinued because of the nausea and general malaise induced In spite of the X ray report and the sulphapyridine, the condition of the base remained unchanged, and she was referred to one of us (B G E) for opinion on June 30 As the door opened to admit her the horribly offensive odour of a lung abscess or bronchiectasis was perceptible She repeated the history already given to her own doctor, adding, however, that she had had a cough for 12 months, had lost weight off and on for the same period, and that she had a poor appetite and recurrent indigestion For the past 6 weeks she had had constant pain in her left side, made worse by coughing and breathing She had not noticed any foul odour or taste in the phlegm, though she brought up great quantities —She denied having aspirated a foreign body

She was a thin, nervous, apprehensive but intelligent woman, with moist skin, moist slightly coated tongue, some dyspnœa, a slight degree of cyanosis of lips and fingers, and early clubbing Pulse rate 86, temperature 97° F Diminished movement over whole left hemithorax, especially at base Percussion over upper chest, to the level of the 3rd rib in front and angle of scapula behind, gave a relaxed note , below these levels note much impaired but without the "feel" of fluid Over the left upper lobe breath sounds were harsh, with prolonged expiration , at the base they were diminished, with diminished vocal resonance , at the angle of the scapula they were high pitched and tubular, with increased vocal resonance, exquisite pectoriloquy and numerous coarse rale Right lung showed prolonged expiration over upper zone, and emphysematous changes over the mid and lower zone Heart displaced to left

The case was diagnosed as bronchiectasis with pulmonary fibrotic induration and pulmonary atelectasis , but despite the negative history a note was made that the causative factor might be an inhaled foreign body X-ray examination confirmed the clinical finding, and showed congestion of the upper ight lung field due to the mechanical obstruction offered to the passage of blood in the damaged left lung Sputum contained large numbers of pneumococci and streptococci Tubercle bacillus, actinomyces, or other fungi, were not found

---

[1] Chapman, C L G *Brit J Surg* 1941, 28, 633

On July 7 she admitted under pressure that 10 years ago she "swallowed" a piece of bone when taking soup, a severe fit of coughing followed, and she immediately coughed up some blood Alarmed, she consulted a doctor, who summarily dismissed the idea that she had inhaled the bone into her lungs Finally she lost her symptoms, but from that time to the present she has been subject to "cold on her chest" and bronchitis, especially in damp and cold weather During the 10 years since this occurrence she has consulted several doctors about her chest, and had endeavoured to get her tale listened to, but each had dismissed her theory that she had inhaled the piece of bone, and at last she resolved never again to mention it to any medical man She was admitted to the London Chest Hospital under the care of one of us (H V M.) Bronchoscopy revealed no evidence of foreign body, but there was a mass of granulation tissue projecting into the lumen of the bronchus which was thought to be an old innocent tumour becoming malignant Section showed no malignancy but much hyperplasia Three days later she developed collapse of the right lower lobe This suggested that a foreign body had been present in the left lower bronchus, and that during the severe coughing which occurred while her larynx was being painted for the bronchoscopy it might have been dislodged, coughed as far as the bifurcation and then aspirated into the right bronchus A second bronchoscopy proved this to be the case the piece of bone was successfully removed after its 10 years residence, and measured 1½ × 2 cm

CASE 2—The parents of a boy aged 6 years gave the following history While eating peanuts the child suddenly choked, became dyspnœic and developed a croupy cough. He was rushed to a children's hospital where this history was given A diagnosis of laryngeal diphtheria was made and the child was transferred to a fever hospital, where the history was again ignored and where he remained for six weeks, the diagnosis remaining doubtful, and he was then discharged. The croupy cough, the paroxysmal asphyxial attacks of dyspnœa persisted and the child was admitted to the London Chest Hospital He had coarse rhonchi best heard over the central part of the chest in front X ray negative Bronchoscopy revealed a split peanut lying loose in the trachea and sliding up and down it with each respiratory movement Removal of the nut produced a complete cure The fact that the nut remained free in the trachea accounted for the paroxysmal asphyxial attacks of dyspnœa and the croupy cough and also for the comparative absence of physical signs and damage to the lung tissue

CASE 3.—The parents of a baby aged 2 years gave the following history While he was sucking sweets he had a choking fit, followed by a croupy cough and dyspnœa He was taken to a children's hospital, the history was given and a diagnosis of laryngeal diphtheria was made The child was transferred to a fever hospital where he remained for 6 weeks, the diagnosis remaining doubtful He was then discharged and brought to the London Chest Hospital He was desperately ill, coughing up foul sputum, temperature 102° 5 F, pulse-rate 140 respirations 40–50 Physical and radiological findings left no doubt that the right lung was collapsed and suppurating It seemed at first that a sweet aspirated into the tracheobronchial tree would have dissolved, and was therefore unlikely to be the cause of the patient's condition, and it seemed undesirable to bronchoscope such a sick infant on an off-chance But it was remembered that sweets often contain nuts, and the mother thought the sweet in question was a sugared almond Bronchoscopy showed an almond completely obstructing the right main bronchus Owing to its long stay in the bronchus it was friable and could only be removed piecemeal. After its removal the child made some progress, but developed an empyema secondary to the pulmonary suppuration After drainage of the empyema the child's condition improved

CASE 4—A man aged 35 came to the Miller General Hospital with the history that 3 days previously, when eating mutton stew, he had choked while a small bone was in his mouth, since then he had had a continual cough which had prevented him from sleeping Physical and radiological examinations were negative Since the bronchoscopic clinic at the London Chest Hospital had just been severely damaged by enemy action, and it was inconvenient to do a bronchoscopy elsewhere, the patient was given an expectorant mixture and told to report in a week unless anything untoward occurred. At the end of the week his condition was unchanged, and a bronchoscopy showed a mutton bone 1½ × 2¼ cm. lodged in the right main bronchus in such a position as not to cause any serious obstruction to the air entry, it had therefore produced no physical signs or damage to the lung tissue Removal produced a complete cure

These cases suggest that, even if ethically a patient cannot be considered to be a customer, at least he is sometimes right

---

ADDITION OF GLUCOSE TO STORED BLOOD

R A. BONO   J F. C WILLDER

TECHNICIANS AT THE SOUTH-EASTERN BLOOD-SUPPLY DEPOT

IT was shown by Rous and Turner[1] that the addition of glucose to blood delayed progressive hæmolysis during storage In its war memo No 1 the M R C Committee on traumatic shock modified the original method of Rous and Turner and recommended the addition of 20 c cm of 15% glucose to a mixture of 100 c cm of 3% sodium citrate solution and 420 c cm of blood The addition of glucose, however, presents difficulties, for while glucose in water may be sterilised with little or no change in colour the autoclaving of glucose in citrate solution causes much caramelisation and subsequent discoloration of the blood plasma For this reason it is necessary to sterilise the glucose solution separately and then mix it with citrate in a sterile bottle before or after the addition of blood In either case, the glucose must be introduced by uncapping the bottle, or by injecting it with a sterile syringe, first through a perforated metal cap and then through a rubber washer Both methods involve an extra manipulation of sterile material and so double the chances of infection, a consideration of special importance when the material is to be stored for some time before use In order to overcome this difficulty the following method has been devised

A stout hard glass test-tube (4 × ½ in) containing 6 c cm 50% glucose is carefully lowered into a M R C pattern blood-bottle holding 120 c.cm 2 5% sodium citrate The bottle is then capped and autoclaved for 30 min. at 20 lb pressure In this way the glucose and citrate solutions are kept apart until sterilisation is complete When the bottle and its contents are cool the glucose and citrate may be mixed by tilting and hardly any colour can be detected in the mixed solutions

The 50% glucose solution is prepared as follows A 5 litre Pyrex flask is taken and a mark is made on the neck corresponding to the 5500 c cm. level Glucose, 2750 g, is placed in the flask and freshly distilled boiling water added. The glucose slowly dissolves and when solution is complete water is added to the mark after cooling The glucose solution is then placed in bulks of 500 c cm. in M.R C pattern blood-bottles and autoclaved for 30 min at 20 lb pressure, 6 c cm. of solution is run into a series of test-tubes by means of an automatic pipette The test-tubes are lowered into the bottles containing the citrate solution, the caps screwed on tight, and the whole batch of bottles sterilised at once Any glucose not used within two hours of the glucose bottle being opened is discarded

If the glucose tube is of the correct dimensions the knack of mixing the glucose with the citrate may quickly be acquired and hundreds of bottles may be prepared rapidly A tube which is too short is liable to capsize early in the operation, and caramelisation follows If the tube is too long some of the glucose may remain in it and insufficient citrate may enter, under these conditions any blood entering the tube may clot But when the details are accurately followed there is no clotting, in 800 bottles collected no clotting has been noted

---

[1] Rous, P and Turner, J R. *J exp Med* 1916, 23, 219

DRASTIC REMEDY FOR THROMBOSIS—Where clinical findings suggest thrombosis of the deep veins of the leg Jacob Fine and John B Sears (*Ann Surg* 1941, 114, 801) recommend division of the femoral vein below or above the profunda. They cite cases in which they believe a very real danger of pulmonary embolism has been avoided Where minor non-fatal emboli have occurred they think that division of the main vein is the one effective measure that can be taken to avoid further emboli Their patients showed no more disability from venous obstruction than was to be expected from the phlebitis alone

Medical Societies

ROYAL SOCIETY OF MEDICINE

ON Jan 17 there was a joint meeting of the sections of Neurology and Orthopædics which members of the sections of Medicine, Physical Medicine and Radiology were invited to attend Colonel **GEORGE RIDDOCH** took the chair and a discussion on

Sciatic Pain

was opened by Dr J **PURDON MARTIN** He said that the subject had become confused, partly owing to much new work in the last few years which had not been properly digested, and partly because of inexact terminology By sciatic pain he meant pain referred to the course and distribution of the sciatic nerve The cutaneous distribution of the nerve was limited to areas below the knee, but it gave motor and deep sensory innervation to the muscles at the back of the thigh, and to those of the back and outer side of the leg The pain was typically a deep one and was felt in the muscles There appeared to be tenderness along the course of the nerve, but it was doubtful whether this really indicated that the nerve was tender The muscles were tender, and he had found that the muscles on the outer side of the leg might be tender when there was no tenderness of the common peroneal nerve at the neck of the fibula He thought that the pain excited by extension of the limb was probably due to stretching of the hyperalgesic muscles It had been attributed to stretching of the inflamed nerve, and even to adhesions, but in some cases of referred sciatic pain it could be abolished by anæsthetisation of the exciting focus, so that it could not be due to inflammation or adhesions The causes of sciatic pain fell into two groups disturbances affecting the nerve itself, or one of its roots, and causes producing pain referred to the distribution of the nerve from a focus that might or might not be within its territory The referred pain was the commoner Mackenzie's conception that referred pain was due to an irritable focus in the spinal cord had stood the test of time and had received support from Sherrington's demonstration of a "central excitatory state" affecting motor cells in the cord The cells concerned with referred pain were those in the posterior horn of the grey matter and they formed a continuous column which was not segmented Referred pain was not, strictly speaking, segmental, though it might be so with a moderate stimulus All the structures within the affected territory were hyperalgesic Referred pain could not impair function or abolish reflexes The chief sources from which pain was referred into the sciatic distribution were from arthritis and periarthritis of the hip and lumbar spine Malignant disease of the lumbar spine might cause sciatic pain at a time when no abnormality could be made out in the X-ray films, and as there was at that stage no impairment of the functions of the sciatic nerve the pain was probably referred from the diseased bone The treatment of referred sciatic pain was to treat the primary focus Harris was using the method of local injection in suitable cases 20 years ago, employing quinine urea, and later very small injections of alcohol, and in the last few years J H Kellgren, using procaine preparations, had made this method his own Disturbances which might affect the nerve itself or its roots were many The protruded nucleus of a broken intervertebral disc usually caused an irritation of a single root This was undoubtedly the same as the "radicular sciatica" of Dejerine and others, and the exponents of protruded discs had not so far added anything to the symptoms described by Dejerine We were still somewhat weak in the diagnosis of these cases Like any other neurological problem, it could be divided into "where is the lesion?" and "what is the lesion?" The distribution of the pain and any sensory or reflex impairment indicated which root was affected For the answer to the second question we were dependent on signs elsewhere, special investigations and the history The pain in the back was probably referred from the damaged disc or ligaments under stress The simple X-ray appearances and the C S F findings were not very helpful in differential diagnosis, and we had to use X-ray examination with contrast media, of which air was the best, 'Lipiodol' should not be used lightly. He believed we would eventually be able to diagnose these cases clinically when we got to know the syndrome caused by the lesion of the disc itself at whatever level, and in fact we might do it better than with contrast media, because there must be some cases in which no constriction of the theca was produced Dr Martin declared that a sciatic neuritis existed—an interstitial neuritis analogous to those which affected other nerves—though there was little recent pathological confirmation Its signs were absence *of the ankle-jerk and wasting of the calf muscles* Some patients had only one attack and others recovered in a few weeks The outstanding symptom was pain, and there were signs of interference with the nerve function, but paralysis was unusual and generally associated with a gross lesion The signs and symptoms were not localised to the distribution of a single root, but there were usually signs of more widespread inflammation There was nearly always a point of tenderness below the iliac crest on the upper and outer part of the buttock

Mr V H **ELLIS** said that neurologists were now reaching a conception that in sciatica there was usually nothing much wrong with the great sciatic nerve trunk, nor was the pain referred to its cutaneous distribution In theory, sciatic pain might arise within the nerve or its central connexion, or might be due to irritation of the nerve or its roots from outside, or to stimulation of nerve-endings of similar segmental distribution in other regions, from which the pain was referred to the sciatic area. Sciatic neuritis was extremely rare and he had never seen hyperæsthesia referred to the dorsum of the foot in sciatica, though the whole of the cutaneous distribution of the nerve ought to be affected by a neuritis of the main trunk Irritation of the nerve or its roots might be caused not only by lesions of an intervertebral disc but also by an intraspinal tumour, subarachnoid adhesions and possibly by spinal osteophytes or tumours of the pelvis Seddon had ascribed sciatic pain to tuberculous caries of the sacro-iliac joint To produce pain in a nerve, movement was generally required as well as pressure; this fact might explain why sciatic pain was sometimes intermittent and why certain forms of treatment gave no relief Rupture of an intervertebral disc suggested a severe traumatic strain on an intervertebral joint, and hypertrophy of the ligamentum subflavum suggested a similar ætiology He doubted whether protrusion of the disc was always the only lesion present, and asked whether it might not be associated with a strain of an intervertebral joint Movement was required to elicit pain when any of those three lesions was present Sciatica could nearly always be relieved by immobilisation of the lumbar spine, fusion of the lumbar spine relieved symptoms caused by disc protrusion, but prolapse of the disc was not the only factor responsible for pain Fusion after laminectomy gave better results, and Watson Jones recommended posterior root division as well as removal of the disc, which by itself seemed not always to produce a permanent cure It therefore appeared that sciatica might be due to intervertebral strain, a wide class of injuries of which rupture of the disc might be merely a complication In treatment, the lumbar spine might be immobilised by methods varying from rest in bed to fusion of the spine Application of a plaster jacket in suspension, possibly prolonged into a short hip spica, would give relief even in a case of protruded disc, but not permanently A protruded disc might be reduced by alteration in the position of the lumbar spine, but it was not likely that the ruptured fibrous ring would heal and fix it permanently in place Spontaneous reduction, however, probably accounted for some of the remissions He had brought about permanent relief in non-fibrositic cases by immobilisation and by simple traction on the affected limb with the patient recumbent Manipulation of the spine sometimes gave relief but was dangerous unless a ruptured disc had been excluded

Dr F A **ELLIOTT** pointed out a gulf between orthopædic and neurological views on the cause of sciatic pain He analysed an unselected group of 115 cases admitted to three emergency hospitals Of these 84 had pain of true sciatic distribution, 16 were obvious cases of fibrositis Interstitial neuritis, comparable to brachial neuritis, was present and obvious in 3, and was quite unlike any type of fibrositis, the ankle-jerk was absent and recovery was very slow Radiculitis was diagnosed in 2 young men who apparently had sciatic neuritis but whose cerebrospinal fluid had a protein content above 100 mg With osteo-arthritis of the 4th and 5th lumbar vertebræ there was localised inflammation with gross lipping, and the question arose whether the high sciatica was caused in any way by the osteo-arthritis If the root was anæsthetised in the canal the pain was completely relieved for 2–3 hours Osteo-arthritis of the hip was diagnosed in 8 cases, the fact that pyogenic or tuberculous disease of the hip does not usually cause sciatic pain was a warning that osteo-arthritis here would not be accepted as the cause of a sciatica without more evidence Sacro-iliac arthritis was difficult to diagnose because clinical signs were unreliable Subacute arthritis of the sacro-iliac joint accounted for 5 cases in his series, Pott's disease for 4 or 5, and malignant econdaries for 4 or 5 more, 3 cases were due to tumours of the cauda equina, 2 to herniation of the nucleus pulposus, 1 to protrusion of an intervertebral disc, and patient was a malingerer who had suffered from sciatica before and was reproducing his earlier symptoms Sciatics of long standing tended to develop a neurosis which was either a hysteria or a true anxiety state due partly to long-standing pain and partly to long discussions round the bedside during which the patient began to realise that his doctors were not very sure what was the matter An anxiety state did not indicate that the sciatica was spurious, but it was a definite complication

Mr **Joe Pennybacker** doubted whether significant advances would be made until Dr Martin's definition was accepted Diagnosis of protrusion of an intervertebral disc usually rested on the history, which began with a strain—as a rule a minor strain in flexion The patient might be so obsessed with the sciatic pain that the cause was only revealed on direct inquiry Diagnosis from neurological signs would vary with the diligence of the surgeon in seeking them Love had reported neurological abnormalities in 85% of cases One of the commonest signs, and one generally missed, was muscular weakness when the power of dorsiflexion of the foot was tested against resistance, there was a definite weakness on the affected side, but complete sensory loss was rare, more commonly there was slight hypo-æsthesia, loss of the sense of tickling and slight impairment of response to pin-prick Abnormalities of reflex varied The cerebrospinal fluid was normal or had a slight increase of protein Lipiodol had become somewhat dangerous because old stocks were now being used which contained relatively large amounts of free iodine Most patients responded to rest, but if this could not be arranged for and the pain was not disabling, the sciatica could sometimes be relieved enough by an extension plaster jacket for the patient to return to work Local injections were harmless, but their results were not very impressive Operation should only be advised if response to rest and immobilisation was not satisfactory Spinal manipulation might cause obstinate cauda-equinal paralysis Further advances would come through orthopædists and neurologists seeing cases together and committing themselves in writing to a definite diagnosis and suggestions for treatment It was necessary to know the reason why explorations had proved negative and to be sure that the lesion had not been missed Proper follow-up, as yet rare, was essential

The **President** observed that diagnosis was the crux of the matter and ought to precede any form of treatment The profession should discard the notion that sciatica had a simple pathology, and he thought that to give it another name—such as posterior crural pain—might help He confirmed the need for a really scientific clinical investigation by a team consisting of neurologists, orthopædists and physiotherapists, with a proper follow-up

Dr P P **Dalton** stressed the importance of the vegetative nervous system as the site of minute points of pain which would cause sciatica The referred pain, he said, was often accompanied by other symptoms of neural disturbance, and in some cases vasomotor reflexes were excited when the painful point was injected The pattern of the painful spots was similar to that of the underlying deep blood-vessels Oozing of blood from the needle punctures was far more common than would be expected, which confirmed the belief that the spots lay in highly vascular areas—that was to say in areas well supplied with vegetative nerve-fibres The sensation of cold in the affected limb was due to vasoconstriction He had produced pain or a sensation of extreme cold down the sole of the foot by injecting spots some two and a half inches deep lateral to the superior surface of the first lumbar vertebra, this result would be anatomically impossible if the path of the stimulus were along the cerebrospinal nervous system Disturbance of the vegetative nervous system was the only pathological state which fitted all the facts, and was one of the commonest causes of sciatica and other reflex pains

Mr L S **Michaelis** suggested that local and acute cooling—for instance, by lying on a wet lawn between games of tennis—might be one cause of sciatica He urged that before more drastic remedies were tried, the patient should be given analgesics and vitamin B and be encouraged to move as soon as possible

Dr **James Cyriax** said that 15% of all cases were due to adhesions affecting the sciatic nerve The sciatic patient always had pain on some movement, and if pain could be shown to be due entirely to the stretching of the nerve structure, the nerve sheath was obviously involved If the sheath alone were involved and epidermal injection could be given at once, the patient could then usually reach another 8 in down his leg and the diagnosis was confirmed If the improvement was transitory, clearly the condition was a sciatic perineuritis, but not of the sort that could be cured by local anæsthesia, there must, in fact, be a frictional cause, usually a protruding disc This was present in about a tenth of the cases of diffuse pain felt down the thigh and in the leg Diagnosis of protrusion of a disc could therefore be made purely on the response to local anæsthesia The absence of signs other than loss of ankle-jerk and wasting of the glutei suggested a disc lesion, and weakness of dorsiflexion of the foot was typical of it Most patients with pain down the leg, however, were suffering from referred pain which might come from any deep-seated structure proximal to the segments from the 4th lumbar to the 2nd sacral Diagnosis could nearly always be made from observing what movement hurt Local anæsthesia could be used to corroborate, and treatment was nearly always physiotherapy applied to the source of pain The treatment of sciatic perineuritis was not physical but consisted of local anæsthesia, a protruding disc should nearly always be removed

Group-Captain C P **Symonds** said he had very little to retract from what he had said three years ago when Dr J G. Love had addressed the section The syndrome in patients with proved protrusion of the disc appeared identical with that seen in scores of others who had recovered with rest and warmth alone If prolapse of the disc had any substantial incidence, it must often be capable of spontaneous repair He added, however, from later experience that in healthy young people prolapsed disc was by far the commonest cause of sciatica Prolapsed disc could be diagnosed with considerable certainty if recurrent lumbago were followed by recurrent sciatica in a healthy young person He was not prepared to advise operation in any case If rest had been tried for a reasonable time and failed, the Service patient should be invalided out Results of surgical intervention had been deplorably unsuccessful

Dr **Henry Wilson** spoke of 80 cases of sciatica admitted to the London Hospital in the last 5 years In no less than 25% the house-physician or registrar had noted a slightly abnormal mental attitude He did not include the word " anxious," for any patient with serious sciatica might be anxious, nor had he included " exhausted " These reactions were probably frequent because of long inactivity, such patients ought to be given suitable employment for their upper limbs and their minds Possibly pain which continued after 3 months was really hysterical in origin If a patient did not react to ordinary treatment after a reasonable time, a psychiatrist might be called in to inquire whether an escape mechanism was prolonging the symptoms — Major G D **Kersley** said that strict immobilisation should always be tried before operation was considered, for Service patients he would not consider operation at all —Mr **Harvey Jackson** declared that hernia of the nucleus pulposus had been given undue importance, by itself, it did not produce sciatica He asked how long would elapse between injury to the back and evidence of nuclear herniation If the lesion could remain quiescent for 2 years, it was difficult to evaluate fixation Clinical diagnosis was not possible, an impression only could be gained, accessory means were needed to make certain The patient must be incapacitated from work before operation was justified Nuclear hernia sometimes produced a neuritis and sometimes not The ligamentum subflavum played no part in sciatic pain intermittent strain always produced hypertrophy, which in this ligament was merely a result of the deformity

Reviews of Books

Foundations of Neuropsychiatry

(2nd ed) STANLEY COBB, M D London Baillière, Tindall and Co Pp 231 14s

A RECENT controversy about the neurological approach to mental disorder showed how easily and vehemently the connexion between neural and psychological functions can be denied, or belittled, by those who are mindful of past crimes of omission and commission on both sides In America they seem readier to accept the connexion, and Professor Cobb's book, now in its second edition, takes it for granted By describing the present state of knowledge in the anatomy physiology and pathology of the nervous system, he demonstrates that psychiatry can—indeed must—eat also at this table if it is not to become swollen with wind and rank mists In his introductory chapter, Cobb recognises that the mental sciences are separated from their foundations in anatomy, physics, chemistry, physiology, neurology and experimental psychology by a gap in our knowledge that is at present filled by theories with little support in scientifically controlled observations But he sees no reason for assuming that accurate controllable methods will never be applied to the observation of human behaviour "it is because the science of psychiatry is young that it seems too complex for quantitative analysis "

The book is mainly, as in the previous edition, an exposition of the facts and correlations needed to understand the simpler workings of the central nervous system, whether in health or disease Recent work is incorporated, and general principles made clear wherever possible The chapters on the autonomic nervous system, the cerebral circulation, and epilepsy, have been largely rewritten, and a chapter on psychopathology added This last is brief and schematic, and contains controversial statements such as that one must take schizophrenia and affective psychoses as fundamentally one—the " schizo-affective group " This is the least satisfactory chapter, because uncritical and misleadingly sketchy The book as a whole, however, is ideal for introducing the medical student to the combined discipline, it gives him a sound basis for his further studies

Science for the Prosecution

JULIUS GRANT, M Sc, Ph D, F I C London Chapman and Hall Pp 302 15s

A SUBJECT so new, so fluid, so various and so much hampered by the lack of an English journal as contemporary forensic science takes some presenting, but there has long been a space waiting on the shelf for Dr Grant's book He describes the forensic uses of chemical analysis, serology, and the forms of radiation —from X rays to the infrared—which may be harnessed by means of the camera, the microscope, the spectroscope, or the naked eye, and in a final chapter he discusses the psychological examination and treatment of the offender Thus he has certainly covered the ground, though he might have opened up a little more about the comparison microscope, the use of oblique illumination in deciphering impressions of writing, and about ways of restoring erased markings to materials other than paper The arrangement is rather woolly and a few good diagrams might well replace the explanation of the action of the spectroscope, which will be almost incomprehensible to the lay reader The book is also marred by some minor misstatements Nevertheless the various people to whom it is addressed—the scientist, the social worker, the lawyer, the policeman and the general reader—will be able to find the facts in it even if they take a little hunting out

Recent Advances in Medicine

(10th ed) G E BEAUMONT, D M Oxfd, F R C P, and E C DODDS, M D, D Sc Lond London J and A Churchill Pp 440 18s

DESPITE the war, Dr Beaumont and Professor Dodds have had much new material to incorporate in their triennial new edition The expanded chapter on the sulphanilamide drugs now includes sulphathiazole, but it is not made clear that the nausea and depression produced by this drug are usually much less than those caused by sulphapyridine Other new material relates to vitamin P, stilbœstrol and hexœstrol, electro-encephalography, sodium diphenyl-hydantoinate, h[illegible]caic, sternal puncture, heparin and plasma transfusion and the estimation of prothrombin The sections on vitamin B, Addison's disease, and the macrocytic anæmias have been radically revised, and the chapter on basal metabolism has been dropped one sighs to think how important it seemed fifteen years ago Though the diabetic section has been much improved, the diets are still calculated in grammes to the second decimal place and have not been adapted to our rationing restrictions In the chapter on liver-function tests, the value of a galactose test and a phosphatase determination in helping to distinguish between obstructive and hepatitic jaundice finds no place In other points physicians familiar with a disease under discussion may differ from the authors, for example, they say that hypertensive neuro-retinopathy "may" occur in malignant renal nephrosclerosis, while most observers regard it as essential to the clinical diagnosis Why should a diabetic, just out of coma, be given an enema? How many moderns treat acute nephritis by cupping and hot air baths? But some idiosyncrasies are bound to show themselves where two men, however widely experienced, survey the whole field of medicine Their book remains both popular and valuable

Schizophrenia in Childhood

CHARLES BRADLEY, M D, medical director, Emma Pendleton Bradley Home, East Providence, Rhode Island London Macmillan Co Pp 149 10s 6d

THIS conscientious study is a satisfactory introduction to the published work on psychoses in children and the bibliography makes it useful as a book of reference But it will disappoint those who would have liked to learn the outcome of Dr Bradley's observation of schizophrenic children over long periods The cases quoted however add little to what has already been observed in child schizophrenics elsewhere; they serve to illustrate those traits which he picks out, but accounts of children's play and fantasies are lacking, and there is no real picture of their relationship with parents or siblings When he comes to likely ages for onset, he avoids discussing puberty and the early negative phase lest he should be led too far afield Psychological and physical factors as possible causes of schizophrenia in children actually under observation have not yet, he says, been systematically studied With the unparalleled opportunities available at the Bradley Home, we may hope he will supply some studies of the kind himself

The March of Medicine

New York Academy of Medicine Lectures to the Laity 1940 London Humphrey Milford, Oxford University Press Pp 144 13s 6d

THE New York Academy of Medicine annually arranges a course of lectures in which medical progress in various fields is expounded in non-technical language by a team of experts to the laity The recently published series for 1940 consists of six lectures Dr Abraham Myerson discusses the inheritance of mental illness and Dr Perrin H Long chemical warfare against disease, Dr Paul Reznikoff tells the story of our knowledge of the blood and Dr Thomas M Rivers that of the viruses, the ascent from Bedlam and the evolution of modern psychotherapy are described by Dr Richard H Hutchings, and the romance of bronchoscopy by Dr Chevalier Jackson and Dr Chevalier L Jackson Those who heard these lectures delivered may count themselves fortunate, for it would be hard to find more lucid or more lively expositions Though designed for the layman, no doctor need think it beneath his dignity to read them, for he can hardly do so without pleasure and profit

THE LANCET

LONDON SATURDAY, JANUARY 31, 1942

E M S—THE NEXT PHASE

THIS war of movement is kaleidoscopic in its hanges Almost nothing which has happened since ussia signed the treaty of friendship with Germany the summer of 1939 till she was attacked without arning in 1941 could have been foreseen by the rdinary well-informed person Whether those who ere in the best position to judge have been nearer he mark is doubtful It is in this maze of unknowns hat the Emergency Medical Service has been designed nd evolved The immediate burden of air-raid asualties with which it was planned to cope was set t a very high figure, which experience has not veri- ed It was intended to deal also with Service asualties which might arise from action in this ountry or Western Europe, and for some Service ick. It has assumed responsibility for the hospital are of many other sections of the population including evacuated civilians and transferred workers It as grown by its own momentum Finding the ospital organisation of the country very uneven in quantity and quality, it has sought to make up local eficiencies in bed accommodation and has developed pecial units for head and chest lesions, fractures, acial injuries, neurological conditions pathological ervices and so on, in areas where they had been nbryonic or lacking This has had to be done within e framework of an incoördinate hospital system unded largely on part-time service from its most ghly skilled personnel, at a time when the demands the Fighting Services for medical men and women all categories have been steadily growing The easure of success it has achieved under these difficult onditions is a credit to its architects On the whole has proved efficient in dealing with the emergency lls which have so far been made on it, both as the sult of air-raids and in the days when the B E F as evacuated from the Low Countries

So far the headquarters of this service and its agents the regions have been engaged in building it up ow they have to accommodate themselves to chang- g circumstances, and in so doing must create for hemselves difficulties somewhat different from those hich had to be overcome at the outset The need of he Fighting Services for medical officers is great hese services have, no doubt, been uneconomical in heir use of medical personnel in the past and though hey have already done a good deal in this way there re probably still many directions in which reorganisa- ion and coöperation with one another and with ivilian establishments might limit the growth of their emands While this side of the question should be atched, nothing must be allowed to stand in the way f the full development of their medical efficiency he E M S and the hospitals with which it is associ- ted have all along made a substantial contribution y releasing young men from their staffs, but this has een done more by the natural flow of young graduates hrough the institutions than by curtailment of their stablishments Indeed some hospitals are more berally officered than they were before the war, and others whose bed-occupancy has fallen as the result of war conditions have not cut their staffs accordingly Swelling outpatient departments are one reason for the retention of medical officers and this untimely exacerbation of a peace-time problem will have to be examined, but the policy of allowing a margin of personnel in individual hospitals to meet exceptional stress must be still further modified As experience teaches, as the war changes in fashion and in scope administrative reactions must be quick, even if they involve taking risks General practice has supplied a larger slice of its personnel to the Forces without replacement than any other branch of medicine Civilian hospitals are now being asked to make a like contribution mainly from the junior ranks of their resident staffs[1] a contribution which can be effective only if the reduction of establishments is maintained for the duration of the war As the E M S is dependent on most of the hospitals affected, its cooperation in the process is necessary and no doubt assured But if the reduction is to be done quickly and equitably it will require not only the full assent and diligence of the regional and hospital medical officers and group officers of the service, and of the visiting staffs of hospitals but also an abstention from haggling between one hospital or group of hospitals and another It will also entail greater acceptance than hitherto of the idea that members of the medical staff of a particular hospital shall be freely movable to another as the need arises, and not merely in extreme emergency Those hospitals which can make use of senior medical students with least interruption of their studies should now recognise that this, the only feasible form of dilution in medical practice, is now imperative As some compensation for shortage, also, greater use might be made in some areas of medical men in the Fighting Services while they are held in reserve, or under training, or engaged in work which requires their presence but does not fully occupy their time

A recent letter in our correspondence columns[2] gave expression to the uneasiness among older men at the retention of young consultants or specialists in civilian life under part-time contract with the E M S So far as numbers are concerned—and that is what counts at the present time—this is not a large problem At the outbreak of war the E M S, in anticipation of the heavy casualties then envisaged, impanelled many consultants and specialists and some general practitioners on a whole-time basis, especially in London Within a few months, when experience indicated that this arrangement was unnecessary, some were released entirely, others were retained at a part-time salary with an obligation to give whole-time service if required in emergency, and others continued to be employed at sessional rates There are objections to sessional rates for regular part-time attendance on hospital patients, and if whole-time service is not required the second arrangement is clearly the best If any individuals on such contracts are not devoting themselves conscientiously to their duties or required for them, it is a reflection on the internal administration of the scheme and not on the system itself It may be that the position of the younger men in this class will have to be reviewed Although some young specialists were in the Territorial Army or other reserve forces at the outbreak of war, and have continued to serve outside their specialty, such uneconomic use of special skill is undesirable The Fighting Services have not so far wanted specialists in proportion to their numbers at so high a rate as other ranks of the profession If this low rate of demand continues, it may be necessary for specialists to help to fill the quota for general duty, at least until they are required for work in their own province On the other hand, they might be more profitably employed whole-time in civilian hospitals, in order to release still more young residents for general duty in the Fighting Services In these Services specialists engaged in hospitals prepare and keep up to date most of their own clinical records, and senior men employed whole-time in civilian hospitals may similarly have to dispense with the help of housemen in this and other ways Indeed, as the war drags on, all ranks of the profession are likely to find themselves subject to still more regimentation and having to tackle tasks to which they were unused in times of peace

---

[1] See *Lancet* Jan 24 p 114

[2] *Ibid* Jan 3 p 27

SCIATICA

UNTIL there is more agreement about the nature of the lesion in sciatica, treatment is likely to remain empirical and as seldom effective as it is at present It was clear from the RSM discussion reported on another page that part of the difficulty arises in differences of definition what one person calls sciatica another is not willing to accept as such It would seem that the neurologist's definition of sciatica is rather more precise than the orthopædist's, and for the purposes of scientific inquiry the more precise the better Only by accurate definition will sciatica escape from the rather shady implications of "so-called" But for purposes of discussion the term might well cover cases in which pain and physical signs are in the sciatic territory Again, immediate relief by some form of treatment is too often taken as proof of the cause It is tempting to assume that because relief follows rest, and rest is a good thing for inflammation, the trouble has been an inflammation of the nerve trunk or roots, or that because the removal of a protruded nucleus pulposus stops the pain that lesion has been solely responsible for the pain But it is well known that most cases of sciatica recover unaided, even suddenly Nothing but long-term follow-up will advance our knowledge, such a study might profitably include a review of the after-history in cases of untreated sciatica and in cases treated conservatively, for comparison with those submitted to manipulation, injection or operation, the duration of disability and the number of recurrences should be stated At present no clear diagnostic differentiation is possible Radiograms and examination of the cerebrospinal fluid often yield no positive information though they may be of value in excluding other causes of pain in the back and legs Contrast myelography, by means of air or iodised oil, may or may not disclose a disc lesion, but many surgeons doubtful of the innocence of such oil within the theca have given it up and prefer to explore suspects

How does all this affect the general practitioner who is asked to treat a case of sciatica? He will perhaps spend more time in taking the history and in examining the case before accepting his own or the patient's diagnosis of sciatica He will know that most mild cases recover simply by going off work, resting as much as possible, and taking enough of mild analgesic drugs to make life supportable while they are recovering, it is not these cases which worry the doctor In some of the more severe cases there will be evidence to suggest one of the pathological processes mentioned, and he will proceed to order a local injection or some other manœuvre which he has known to be effective in other cases In more severe cases, in chronic cases which have resisted conservative treatment, and in the cases with repeated disabling recurrences, he will ask for help from orthopædist or neurologist These specialists might well work in unison, and no small part of their responsibility should be to follow up their treatment and assess the late results We must refuse to accept defeat The discovery of the disc lesion can be taken as a real advance provided it is not invoked to explain every pain in the back and legs The present-day sufferer from sciatica may take comfort in finding himself a much more interesting case than he would have been twenty years ago

THE RCS LOOKS AHEAD

DANDELIONS and the Royal College of Surgeons of England are about equally difficult to eradicate, someone should have explained this to Hitler before he wasted all that high explosive Restoration of the Hunterian collection is already under way, and the surviving specimens, as we have noted,[1] are safely disposed in *fourteen different places* within 70 miles of London The officers of the college plan that the restored collection shall embody the best aspects of other museums and introduce new features which will make it useful to students of surgery in its widest sense for years to come Many people and many societies have already offered specimens, others have sent gifts in money to help in the task of reconstruction The American College of Surgeons has made a particularly generous gift, in keeping with the help readily provided for the library and research laboratories by the Rockefeller Foundation

The damage to the college buildings and the shortage of staff make it impossible to receive any large quantities of specimens at Lincoln's Inn Fields, and anyhow it is thought safer at present to send new material to the dispersal centres Storage jars and preserving solutions are scarce and transport difficult to arrange, but plans have been made for dealing with such suitable specimens as arrive at the college Dry specimens present no serious problems and the Assistant Conservator will welcome skeletons, skulls, disarticulated bones and "half-sets" Prospective donors of fresh specimens, however, are asked to mark them as destined for the college and to keep them, for the present, until plans can be made for their reception But it would be helpful if the donors would send a note to the Assistant Conservator telling him what they have to offer, he will then register their gift so that he can call it in when a place is ready for it He is always willing to advise about the preservation of material destined for the college

The sections of the Royal Society of Medicine are to be invited to appoint members to organise the collection of specimens in particular subjects The invitaon will be made directly at meetings of the sections y Sir ALFRED WEBB-JOHNSON, president of the college athological specimens of conditions rare in this ountry have already been promised from all quarters f the Empire and from friendly countries These are eing set aside until they can be sent with safety and onvenience The new museum is quickening

---

[1] *Lancet*, Jan. 3, 1942, p 17

Annotations

THE RANGE OF MOSQUITOES

LIKE Spitfires, mosquitoes are spirited performers within their range, but whereas the range of a Spitfire can be nicely calculated, the range of a mosquito can only be observed, and so excites hot disputes Napier in our correspondence columns[1] has described cases of malaria occurring on board a ship lying more than a mile from the shore at Freetown He assumed that mosquitoes must have reached it by sustained flight aided by an off-shore wind, by interrupted flight from ship to ship across the harbour, or by traveling out as passengers on the fruit boats Manson-Bahr later pointed out[2] that, given a favourable wind, subtertian malaria could be contracted anywhere in Freetown harbour Some fresh observations by Hopkins,[3] senior entomologist to the Uganda Medical Department, have lately appeared on the flight range of anophelines Such studies have so far been few in Africa, and workers have been content to follow a rule of thumb, undertaking antimalarial measures within a radius of a mile (or sometimes half a mile) of the area to be protected The discovery of large numbers of *Anopheles funestus*, a dangerous species, at much greater distances than this from its breeding place led to the investigation Hopkins distinguishes between maximum range and maximum effective range of mosquitoes He quotes De Meillon who, working in the Transvaal in 1934, found two female *A funestus* in a house 4½ miles from the nearest breeding place, with no dwellings between There had been no malaria among the occupants of the house, although they took no precautions against it—which suggests that 4½ miles was beyond the range at which the anophelines could collect in sufficient numbers to cause an appreciable amount of malaria He also established that both *A gambiæ* and *A funestus* flew with the prevailing wind P C G Adams, who continued De Meillon's work at Nkana, found that control to a distance of 1½ miles to windward and ½ mile to leeward of the town was not sufficient to prevent the arrival in it of considerable numbers of *A funestus* from an unusually prolific breeding site 3–4 miles to windward Thus a strong prevailing wind can make long-range flights significant Hopkins carried out his study at Busoga College, where there was a high incidence of malaria among staff and pupils The college stands on a hill about 2 miles from Lake Victoria, whence it receives a prevailing wind by day *A funestus* were found to predominate among mosquitoes inside the buildings, *A gambiæ* were few and were easily eliminated by destruction of breeding places near the college No breeding places of *A funestus* were found within 2 miles of the buildings except in one pool nearly that distance to southward, otherwise the breeding places were found in the extensive swamps fringing the lake shore for miles in each direction Though the larvæ were not found in great numbers, the extent of the breeding area made it possible for *A funestus* to sponsor a disquieting amount of malaria in the college The species was rare to the west and north of the college, which suggested that 2 miles was about the limit of the effective range The work of many observers in Africa goes to show that the evening entry of mosquitoes into houses is the important one, consisting largely of females coming to feed, the morning entry consists chiefly of males, with a few females who have already fed, taking shelter for the day At Busoga College the lake breeze blows from 9 30 A M to 11 P M, when it is replaced by the night land breeze Thus, with the help of the lake breeze, mosquitoes arrive in their greatest numbers from the breeding grounds in the early part of the night The lake breeze is not due south, but south-east, and this means that mosquitoes flying with the wind probably come from the most prolific breeding place, about 2½ miles from the college Hopkins concludes that in Uganda neither *A funestus* nor *A gambiæ* are likely to fly much more than half a mile in sufficient numbers to give trouble unless the breeding places are up-wind from the dwellings and exceptionally prolific, the few that do exceed this range can be effectively frustrated by such personal protective measures as mosquito-proof houses, bed-nets, and mosquito boots But where the breeding grounds are extensive and the prevailing evening breeze favourable, the flight range may be 2 miles or more

BISMUTH AS ANTACID AN EXPLODED REPUTATION

BISMUTH subnitrate or carbonate has been advocated for over a century for the relief of the pain of peptic ulcer and other gastric conditions The subnitrate fell out of use when it was found sometimes to cause nitrite poisoning The carbonate was held to relieve gastric pain either by neutralising gastric acidity or by coating the raw surface of an ulcer with a layer of insoluble powder that somehow protected it against mechanical or chemical insult But does bismuth carbonate neutralise acidity or coat an ulcer? And does it relieve gastric pain? Freezer and his colleagues[1] provided a clear answer to the first question a dozen years ago, the chemists showed that the neutralisation of hydrochloric acid and alteration of the pH of gastric juice by bismuth carbonate was trifling beside that achieved by other antacids, the radiologist could see the bismuth in the lower pole of the stomach or diffused through its contents, but never coating the ulcer Alstead[2] has swung another axe among the dead wood He has shown again that the neutralising action of bismuth carbonate on hydrochloric acid and on gastric juice, both in test-tubes and in the stomach, is negligible He has proved that the minute amount of bismuth that goes into solution can have no useful astringent action, and demonstrated again that swallowed bismuth carbonate is not mysteriously attracted to an ulcerated surface Whether bismuth relieves gastric pain cannot be decided by general clinical impression, because it is customary to give it along with other antacids Alstead overcame this difficulty by giving coloured powders of pure bismuth carbonate to patients with gastric pain, and asking them to report the effect of these and of other differently coloured and inert powders The patients found no peculiar virtue in the bismuth carbonate, although most of those tested got prompt relief from magnesium hydroxide Alstead has thus endorsed Hurst's view[3] that the small dose of bismuth carbonate given with sodium bicarbonate in the usual alkaline mixtures, powders and tablets is very unlikely to exert any action Since it also has the disadvantage of making the stools black, so that the patient cannot immediately recognise slight melæna, its use as an antacid has nothing at all to recommend it and a great deal to its discredit Bismuth has important therapeutic and industrial uses which make its frivolous use in stomach mixtures still less justifiable The National War Formulary advises that it should be reserved for the treatment of syphilis, and that magnesium trisilicate should take its place in antacid powders Finally the present cost of bismuth makes its waste unjustifiable Hospitals can buy calcium carbonate at 10*d* a pound and magnesium carbonate at 1*s* 4*d*, and both are good antacids Bismuth carbonate can only be prepared at considerable expense The crude ores are imported at 1*s* 7*d* per lb, but the refining charge is heavy, so that the cost price of the pure metal is 5*s* 7*d* Bismuth carbonate in 2 cwt lots costs about 8*s* per lb, and the retail price in the N H I drug tariff is 12*s* 6*d* Thus it is not only a mistake to use bismuth carbonate as an antacid but a costly mistake, worse, it deflects bismuth from more important service in the construction of aircraft The fact that the Japanese are now in need of 100 tons of bismuth which they cannot get should teach us to husband ours

---

[1] Napier L E *Lancet* 1940 ii, 603
[2] Manson Bahr P *Ibid*, p 696
[3] Hopkins, G H E *East Afr med J* 1941, 18, 175

[1] Freezer C R E Gibson, C S and Matthews, E *Guy's Hosp Rep* 1928 78 191
[2] Alstead, S *Lancet* 1941, ii 420
[3] Hurst A F and Stewart, M J Gastric and Duodenal Ulcer London (1929)

PRESSURE AND POISONING

EACH 33 feet of sea water exerts a pressure of one atmosphere, and this means that for every foot a man goes below the surface his body must withstand an added pressure of half a ton Men working deep down must be protected either by enclosing them in a rigid vessel (e g, a submarine) capable of withstanding the pressure, or, if their body is exposed, by supplying their lungs with air at the same pressure The dangers attending return to the surface have been well known since the time of Paul Bert,[1] and the symptoms in 300 non-fatal cases of "caisson disease" have lately been described[2] These appear when nitrogen forced into solution in the blood and tissues by pressure reappears on decompression in the form of bubbles Everyone nowadays is familiar with the analogy of the soda water syphon, though perhaps not with the fact pointed out by Piccard[3] that a sudden 5 to 1 decrease in pressure is more dangerous for the diver than for the aviator While the speed of growth of a bubble of given diameter is a function of the change of pressure, to both old and new pressures must be added a component—call it y—dependent on the surface tension of the liquid The ratio of the pressure change is therefore for the diver $5 + y/1 + y$, but for the aviator $1 + y/0\ 2 + y$ which is a smaller figure Starting from this simple idea, Piccard shows that over a range of low pressures equilibration is slower than over an apparently equivalent range of high pressures, and that this is advantageous to the individual under the lower pressure conditions The evolution of nitrogen in this way is apparently not the only factor in the production of caisson disease—Swindle[4] puts erythrocyte agglutination as the primary disturbance—but it is the source of the typical "bends" Nitrogen is more soluble in fatty than in aqueous media, the body as a whole will therefore accommodate 70% more than will an equal volume of blood, or 26 times as much as its own available blood-volume can carry[5] The safe diffusion of nitrogen can only take place from the lungs, so the blood acts as a bottleneck in elimination, and decompression must be carried out by easy stages A time factor is introduced by the tissues taking up nitrogen at different rates a long saturation time portends a long desaturation time, so the duration of exposure to pressure greatly influences the speed at which safe decompression may be accomplished A diver may stay for more than 3 hours at 50 ft and emerge with one stop of 20 min on the way up, whereas at 100 ft if he is to break surface after the same interval (three stops of 3, 7 and 10 min), he may not stay for more than 30 min Even in shallow dives, after which immediate decompression is permissible, rupture of the lungs with mediastinal emphysema and air embolism may occur if th diver holds his breath during his ascent to the surfac Some fatal submarine escape accidents have been attributed to this cause, the first step in escape having bee the raising of intrapulmonary pressure to that of th surrounding water[5] Oxygen is also forced into solution in the blood, but is not immediately dependent o diffusion from the lungs for its escape because the tissue can actually use it Decompression can therefore b accelerated by substituting oxygen for some of th nitrogen of the air, but pure oxygen probably at 2 and certainly at 3 atmospheres has a poisonous effect With growing interest in greater depths, and particularly in factors which may prove disastrous in submarin escapes, the pharmacological effect of other commo gases at high pressure has become of importance Th latest investigation is that of J B S Haldane and others[6] who confirm recent American statements that nitrogen is an intoxicant at high pressures The onset and disappearance of symptoms are rapid, arguing an effect on the most vascular part of the nervous system—th grey matter High pressures of carbon dioxide caus mental confusion and loss of consciousness, the effect coming on earlier in the presence of high nitrogen pressure This is *shown by comparing the effects of* air containing 0 3% CO_2 and compressed by 10 atmospheres with those of a 3% concentration of CO_2 in uncompressed air Hydrogen and helium when used instead of nitrogen do not produce symptoms of intoxication, but Haldane does not regard helium as a safeguard against "bends" and other phenomena arising purely from decompression In this he is at variance with some American opinion, but is sustained by th daily inconvenience he suffers from the ravages of a helium bubble, nitrogen having actually behaved in hi experience no worse than helium and certainly wit greater delicacy He thinks the non-toxicity of helium can be attributed neither to a difference in chemical properties nor to greater diffusibility, but to some usually unconsidered physical properties Casualties in hi hardy team of investigators have been light, though man of the experiments involve risk and most of them discomfort A few required immersion in ice cold water i addition to other inconveniences, but the importan fact emerged that temperature had little to do with th *experimental results*

SPEMANN'S GREAT IDEA

THE experimental study of development initiated b Hertwig and Roux towards the end of last centur received its main impetus from the brilliant work of Han Spemann, whose death at the age of 72 has bee announced[7] The concept of the "organiser" too shape from observation of amphibian embryos whic disclosed the process of development as a progressiv elimination, in time and space, of certain potentialitie of cells at first omnipotent Within limits set by th characters of the species, the fate of a given cell (excep in small details) depends not upon itself but upon s influence emanating from an "organisation centre Cells destined to form (say) ventral ectoderm can, a an early stage, be induced to form nerve cord if transplanted to a certain position relative to the primar organisation centre (blastopore lip or primitive streak This primary centre determines a pattern of subcentre each of which in turn works independently to determin the pattern of an organ, where centres of a still low order appear There is a well-ordered and progressiv delegation of responsibility from a central directorate t authorities of a lower and lower grade The mouldin a lens from epidermis under the organising influence the optic cup is an example of a final stage investi ed in detail by Spemann and Mangold One of the st remarkable features of the action of an organiser hat it is complete before any visible change appears the cells upon which it reacts. This invisibly deter ted tissue, as Spemann showed, will differentiate into organ such as a limb, when transplanted to a position ere that organ would not normally appear Under his gence research into the nature of the organising mulus was started in Freiburg by Fischer and hmeier followed shortly by similar investigations by edham and others at Cambridge It now appears t the stimulus inducing a particular kind of tissue is mical in nature, but the "organisation" of this into haracteristic pattern has so far eluded analysis. The e of work initiated by Spemann has in fact brought us e to face with the central problem of biology. His ievement depended as much upon his remarkable ll in micro-surgery as upon his insight into the signifi nce of his results. He was awarded the Nobel prize for dicine in 1935 In the same year he gave an account the progress of experimental embryology in his Silli n Lectures at Yale These were published in 1937 as xperimentelle Beiträge zu einer Theorie der Entwick g" (Engl trans. "Embryonic Development and nduction," Yale 1938)

---

[1] Bert, P La pression barométrique, recherches de physiologie expérimentale, Paris 1878
[2] Thorne I J *J Amer med Ass* 1941 117, 585
[3] Piccard, J *Proc Mayo Clin* 1941 16, 700
[4] Swindle, P P *Amer J Physiol* 1937 120, 59
[5] Haldane, J S and Priestley, J G Respiration, Oxford, 1935
[6] Haldane J B S *Nature* Oct 18 1941, p 458, Case, E and Haldane *J Hyg*, *Camb* 1941, 41, 225
[7] *Schweiz med Wschr* Sept 27, 1941

finally passed through a yellow contrast filter placed in the eye-piece to protect the observer's eyes This apparatus can be used with the monocular microscope Films of sputum are stained with 0·3% auramine in 3% carbolic acid solution at room temperature, and decolorised with 0·5% hydrochloric acid and 0·5% sodium chloride in 70% alcohol. The fluorescence technique gave rather better results than Ziehl-Neelsen stained direct films and concentration tests A series of sputa which yielded 31·3% of positives with a combined Ziehl-Neelsen concentration technique, gave 33·3% with fluorescence examination When compared with direct smear Ziehl-Neelsen staining without concentration a series showed 92·3% of positives for fluorescence as against 74·3% for Ziehl-Neelsen Emil Bogen[2] records the results of the examination of 1000 routine sputum smears in which the fluorescence method gave 20% more positives than the standard Ziehl-Neelsen technique On the other hand 250 sputa examined both by culture and by fluorescence yielded 24% of positives by culture against 11·6% by fluorescence

EVERYTHING IN THE GARDEN

THAT it is the duty of everyone to crop every square yard of garden possible for home consumption and for sale exchange or gift goes without saying, and it is well that a systematic sequence of crops should be planned throughout the year so that there shall be no deficit of vegetables in winter and early spring and no excess in summer The Ministry of Agriculture sets out such a plan for cropping allotments in its bulletin No 1 "Food from the Garden" in 1939 and daily records from 98 gardens and allotments planted according to the Ministry's plan for the season of 1940 have been collected and analysed.[3] According to the analysis, both from the gross yield and from the vitamin A and C values such gardens yielded an admirable addition to the dietary Excluding potatoes, the gardens averaged sufficient vegetables in each quarter for from 6·7 to 10·1 people, whereas they need only supply 4–5 people each As regards vitamin A they supplied the needs of 2 people and as regards vitamin C of 8–12 people according to the season. Those of us who cropped gardens of a similar size in the adverse conditions of 1941 may raise an eyebrow at these results 1940 was an exceptional year, as was shown by its onion crop, in 1941 onions were of the bottle-neck persuasion and have failed to keep and greens were reduced to lace-work by successive raids of caterpillars The assessments of vitamins A and C in the effort have been made in a rough and ready way. All the green vegetables have been lumped together and an average figure accorded to them Thus lettuce finds itself credited with 65 mg of vitamin C per 100 g., whereas figures for lettuces grown in England are about a tenth of this and bulb onions are credited with 16 which is almost certainly too high Then vitamin A is assessed on the carotenoid value, and we have learned to be chary in accepting carotenoid values Biologically estimated values for the carrot give results about a sixth of those based on carotene content Such criticisms however do not invalidate the main conclusions of this analysis which is that carefully planned planting pays

DR ARCHIBALD KERR CHALMERS who died at Bridge-of-Weir on Jan 24 in his eighty-sixth year, was chief health officer of Glasgow for thirty-three years retiring in 1925 A prodigious worker and an accomplished writer he left his mark on the exciting period of sanitary evolution in which it was ordained that he should hold a key-post.

The veteran Dr. PERCY KIDD also passed to his rest on Jan 21.

---

[3] Taylor H. V., Drummond J. C., and Pyke, M. *Nature, Lond* 1941, 148, 712

peutic and industrial uses which make its frivolous use in stomach mixtures still less justifiable The National War Formulary advises that it should be reserved for the treatment of syphilis, and that magnesium trisilicate should take its place in antacid powders Finally the present cost of bismuth makes its waste unjustifiable Hospitals can buy calcium carbonate at 10*d* a pound and magnesium carbonate at 1*s* 4*d*, and both are good antacids Bismuth carbonate can only be prepared at considerable expense The crude ores are imported at 1*s* 7*d* per lb, but the refining charge is heavy, so that the cost price of the pure metal is 5*s* 7*d* Bismuth carbonate in 2 cwt lots costs about 8*s* per lb, and the retail price in the N H I drug tariff is 12*s* 6*d* Thus it is not only a mistake to use bismuth carbonate as an antacid but a costly mistake, worse, it deflects bismuth from more important service in the construction of aircraft The fact that the Japanese are now in need of 100 tons of bismuth which they cannot get should teach us to husband ours

PRESSURE AND POISONING

EACH 33 feet of sea water exerts a pressure of one atmosphere, and this means that for every foot a man goes below the surface his body must withstand an added pressure of half a ton Men working deep down must be protected either by enclosing them in a rigid vessel (e g, a submarine) capable of withstanding the pressure, or, if their body is exposed by supplying their lungs with air at the same pressure The dangers attending return to the surface have been well known since the time of Paul Bert,[1] and the symptoms in 300 non-fatal cases of "caisson disease" have lately been described[2] These appear when nitrogen forced into solution in the blood and tissues by pressure reappears on decompression in the form of bubbles Everyone nowadays is familiar with the analogy of the soda water syphon, though perhaps not with the fact pointed out by Piccard[3] that a sudden 5 to 1 decrease in pressure is more dangerous for the diver than for the aviator While the speed of growth of a bubble of given diameter is a function of the change of pressure, to both old and new pressures must be added a component—call it y—dependent on the surface tension of the liquid The ratio of the pressure change is therefore for the diver $5 + y/1 + y$, but for the aviator $1 + y/0\ 2 + y$ which is a smaller figure Starting from this simple idea, Piccard shows that over a range of low pressures equilibration is slower than over an apparently equivalent range of high pressures, and that this is advantageous to the individual under the lower pressure conditions The evolution of nitrogen in this way is apparently not the only factor in the production of caisson disease—Swindle[4] puts erythrocyte agglutination as the primary disturbance—but it is the source of the typical "bends" Nitrogen is more soluble in fatty than in aqueous media, the body as a whole will therefore accommodate 70% more than will an equal volume of blood, or 26 times as much as its own available blood-volume can carry[5] The safe diffusion of nitrogen can only take place from the lungs, so the blood acts as a bottleneck in elimination, and decompression must be carried out by easy stages A time factor is introduced by the tissues taking up nitrogen at different rates a long saturation time portends a long desaturation time, so the duration of exposure to pressure greatly influences the speed at which safe decompression may be accomplished A diver may stay for more than 3 hours at 50 ft and emerge with one stop of 20 min on the way up, whereas at 100 ft if he is to break surface after the same interval (three stops of 3, 7 and 10 min), he may not stay for more than 30 min Even in shallow dives, after which immediate decompression is permissible, rupture of the lungs with mediastinal emphysema and air embolism may occur if diver holds his breath during his ascent to the surface Some fatal submarine escape accidents have been attributed to this cause, the first step in escape having been the raising of intrapulmonary pressure to that of the surrounding water[5] Oxygen is also forced into solution in the blood, but is not immediately dependent on diffusion from the lungs for its escape because the tissues can actually use it Decompression can therefore be accelerated by substituting oxygen for some of the nitrogen of the air, but pure oxygen probably at 2 and certainly at 3 atmospheres has a poisonous effect[5] With growing interest in greater depths, and particularly in factors which may prove disastrous in submarine escapes, the pharmacological effect of other common gases at high pressure has become of importance The latest investigation is that of J B S Haldane and others[6] who confirm recent American statements that nitrogen is an intoxicant at high pressures The onset and disappearance of symptoms are rapid, arguing an effect on the most vascular part of the nervous system—the grey matter High pressures of carbon dioxide cause mental confusion and loss of consciousness, the effects coming on earlier in the presence of high nitrogen pressure This is shown by comparing the effects of air containing 0 3% CO_2 and compressed by 10 atmospheres with those of a 3% concentration of CO_2 in uncompressed air Hydrogen and helium when used instead of nitrogen do not produce symptoms of intoxication, but Haldane does not regard helium as a safeguard against "bends" and other phenomena arising purely from decompression In this he is at variance with some American opinion, but is sustained by the daily inconvenience he suffers from the ravages of a helium bubble, nitrogen having actually behaved in his experience no worse than helium and certainly with greater delicacy He thinks the non-toxicity of helium can be attributed neither to a difference in chemical properties nor to greater diffusibility, but to some usually unconsidered physical properties Casualties in his hardy team of investigators have been light, though many of the experiments involve risk and most of them discomfort A few required immersion in ice cold water in addition to other inconveniences, but the important fact emerged that temperature had little to do with the experimental results

SPEMANN'S GREAT IDEA

THE experimental study of development initiated by Hertwig and Roux towards the end of last century received its main impetus from the brilliant work of Hans Spemann, whose death at the age of 72 has been announced[7] The concept of the "organiser" took shape from observation of amphibian embryos which disclosed the process of development as a progressive elimination, in time and space, of certain potentialities of cells at first omnipotent Within limits set by the characters of the species, the fate of a given cell (except in small details) depends not upon itself but upon an influence emanating from an "organisation centre" Cells destined to form (say) ventral ectoderm can, at an early stage, be induced to form nerve cord if transplanted to a certain position relative to the primary organisation centre (blastopore lip or primitive streak) This primary centre determines a pattern of subcentres, each of which in turn works independently to determine the pattern of an organ, where centres of a still lower order appear There is a well-ordered and progressive delegation of responsibility from a central directorate to authorities of a lower and lower grade The moulding juries that need urgent treatment Local anæsthesia local and minimal evipan must then be employed A eign body may enter the chest via the abdomen, thus nulating blast lung from which a skiagram will tinguish it In such cases an inhaled anæsthetic g cyclopropane) is permissible as the lung trauma is ely to be more localised

---

[1] Bert, P La pression barométrique, recherches de physiologie expérimentale, Paris, 1878

[2] Thorne I J *J Amer med Ass* 1941, 117, 585

[3] Piccard, J *Proc Mayo Clin* 1941, 16, 700

[4] Swindle, P P *Amer J Physiol* 1937, 120, 59

[5] Haldane, J S and Priestley, J G Respiration, Oxford, 1935

[6] Haldane, J B S *Nature* Oct 18, 1941, p 458, Case, E and Haldane, *J Hyg, Camb* 1941, 41, 225

[7] *Schweiz med Wschr.* Sept 27, 1941

Surgical emphysema, unless extremely severe, usually eds no treatment If severe, a wide needle may inserted under the skin and fascial planes and the air ulked along towards it Mediastinal emphysema, if nsiderable, may require a thoracotomy and incision the mediastinal pleura, allowing exit of the air via the eural cavity, intercostal tube and under-water seal ttle

MEDICINE AND THE LAW

G M C 's Erasure Contested

A PRACTITIONER whose name has been erased from the edical Register has successfully applied to the Divional Court for leave to challenge the decision and for a rection that the decision be annulled He complains at the G M C acted without the "due inquiry" hich section 29 of the Medical Act prescribes and he ks that due inquiry be made The practitioner was respondent in divorce proceedings in which a husband as granted a decree on the ground of his wife's adultery he G M C thereafter directed the doctor to appear fore them to answer the charge that, inasmuch as the leged adultery took place while he was in professional lationship with the petitioner's wife, he was guilty of infamous conduct" within the section It will be called that section 29 gives two grounds for erasing a ame—a conviction for crime and a decision "after due quiry" that the practitioner has been guilty of inamous conduct in any professional respect The M C would be bound by the finding of the criminal urt in the former case The question now is whether e decree of the Divorce Court is equally binding or hether the G M C can be compelled to retry the issue f adultery The practitioner's solicitors sought to offer esh evidence which was not before the Divorce Court, onceivably the G M C, not being bound by the strict ules of evidence, might accept testimony which would e legally inadmissible in a court of law The G M C reating the issue as *res judicata*, declined to sit as a court f appeal from the Divorce Court Thus an interesting nd perhaps novel point arises, did the G M C in accepting the result of a judicial inquiry, fail to make that due inquiry" which the act requires ?

A Swallowed Chicken Bone

A recent Westminster inquest raised the question whether, if a patient complains of having swallowed a one, the hospital is at fault in omitting to examine him ith an œsophagoscope A sergeant in the Army Physical Training Corps, lunching at home on Dec 27, ad a choking sensation after taking a bite from a chicken leg He went to a hospital where the doctor, having looked at his throat and seeing no foreign body, gave him a crust of bread which seemed to be swallowed quite easily The patient was told to return in the morning or to report to his own medical officer He came back later in the day and complained of pain in breathing A second examination disclosed nothing alarming and he was again told to come back next morning Dr R M Haines, assistant pathologist to Westminster Hospital, in answer to a question by the coroner, said that the use of an œsophagoscope might possibly have revealed a small flat piece of bone in the patient's gullet The coroner adjourned the inquest for further evidence The doctor who had attended the patient said that he had relied upon his own judgment and examination, some people had a nervous impression that they had swallowed a bone when in fact they had not, even when they had, the passage of the bone was sometimes quite normal He agreed that, on the facts now known, it was likely that the œsophagoscope would have shown the piece of bone Dr Haines, recalled, said that, since the previous hearing, he had come across two similar cases where the swallowing of a bone proved fatal even though it was removed The coroner said that the evidence had been given frankly A doctor who has to make up his mind on the spot, and who makes a proper examination and comes to a reasonable conclusion, is not to be held responsible even if he turns out to have been wrong The passage of an œsophagoscope was "not a matter to be taken light-heartedly" He was satisfied that the action taken did not lend itself to any adverse comment A verdict of death by misadventure was recorded

RICKETTSIAL INFECTIONS IN MAN

CURRENT notes for December of the Army Pathology Laboratory Service deal with the laboratory diagnosis of rickettsial infections in man Man is susceptible to a number of rickettsial infections and it is essential at the present time for all pathologists to have the means of identifying them The chief insect vectors are known and it is often possible to isolate from them the causal rickettsiæ by inoculation into animals The first table in the notes will therefore be of interest to the general reader

Disease	Rickettsia	Geographical distribution	Insect vectors	Possible vertebrate reservoirs
Exanthematic typhus	*Rickettsia prowazeki*	Europe, Abyssinia, North Africa, Belgian Congo, Asia Minor Persia, North China, Mexico	Louse *Pediculus humanus*	Man
Endemic or murine typhus	*P prowazeki var mooseri* (= *R muricola*)	worldwide	Rat flea *Xenopsylla cheopis*	Rat (squirrel, shrew)
Tsutsuga mushi disease	*R orientalis* (= *R tsutsugamushi*	Japan, Formosa, Malaya, Java, Sumatra New Guinea	Larva of *Trombicula akamushi* (Japan) *T deliensis* (Malaya), *T deliensis* (India), *T minor* (New Guinea)	Bandicoot
Trench fever	*R quintana* (= *R volhynica* and probably *R weigli*	North Africa	Louse *P humanus*	Man
Rocky Mountain spotted fever (Eastern & Western forms)	*Dermacentroxenus rickettsi*	U S A	*Dermacentor andersoni D variabilis*	Goats, hares and other small rodents
Fièvre boutonneuse	*D rickettsi var conori*	Mediterranean zone	Dog tick *Rhipicephalus sanguineus*	Dog
South African tick typhus	*D rickettsi var pijperi*	South Africa*	Tick *Hæmaphysalis leachi*	Dog !
Sao Paulo rural typhus	*D rickettsi var brasiliensis*	Southern Brazil	Tick *Amblyomma cajennense*	Opossum
Q fever	*Rickettsia burneti* (= *R diaporica*	Australia, U S A	Ticks *Hæmaphysalis humerosa* *Dermacentor andersoni* *D occidentalis*, *Amblyomma americanum* *Rhipicephalus sanguineus ?*	Bandicoot

* Tick borne typhus also occurs in Abyssinia and in Kenya where the dog tick *Rhipicephalus sanguineus* acts as vector

---

GUEST HOSPITALS —A ward was opened at the Royal London Ophthalmic Hospital (Moorfields) on Jan 8 by arrangement with the British Red Cross, for sick nurses of the Free French Forces A central hospital with about 100 beds is to be opened by the Norwegian Government in a section of the Craiglockhart Hospital, Edinburgh

Special Articles

WAR WOUNDS OF THE CHEST

Dr **Robert Coope** on Jan 15 opened a course of lectures on war wounds of the chest, planned by Mr **Morriston Davies** and his colleagues of a chest surgical unit E M S, at the Liverpool Medical Institution, with a consideration of the

ANATOMICAL AND PHYSIOLOGICAL BACKGROUND

A surface for the absorption of oxygen and excretion of carbon dioxide whose area is more than half that of a tennis court is, he remarked, packed neatly into the comparatively small volume of the lungs, the air-passages and their subdivisions being the channels whereby the air is brought into effective contact with the blood capillaries in the alveoli of well-defined and corresponding geographical areas Seeing that the dome of the diaphragm projects well upwards, wounds of the lower thorax may easily involve the abdomen as well, and bleeding into the pleural cavity may therefore on occasion come from the liver Wounds which damage the bony framework of the thoracic cage may not only tear the arteries under the ribs, but also drive jagged pieces of bone into the lungs, causing laceration of and bleeding from the lung, pneumothorax and often subcutaneous emphysema Bleeding from the lung itself tends to cease spontaneously, partly because of the low blood-pressure in the pulmonary system, and partly because the laceration may be sealed as the lung contracts down If such a lung is allowed to re-expand too soon, the imperfectly healed tear is opened up again and bleeding recurs

While the lungs and visceral pleura are insensitive to pain, the parietal pleura and the periosteum of the ribs are richly supplied with pain nerves If one or more ribs have been damaged by crushing, bullet or high explosive fragments, pain is severe, continuous and made agonising by deep respiration or by coughing So the breathing is quick and shallow, and inspiration is cut short by a painful grunt This rapid, shallow, incomplete breathing produces a greater or lesser degree of anoxia, with resultant cyanosis, and at the same time carbon dioxide is washed out of the blood So the cyanosis becomes mauve and not deep purple, and as the condition worsens livid or leaden—an indication of dangerous anoxia Early oxygen administration is called for, therefore, to prevent the development of serious anoxia Moreover, coughing is even more painful than breathing, so that the patient does not clear his bronchial tubes Hence the frequent development of obstruction of a bronchus by a plug of mucus, mucopus or blood clot, with resulting absorption collapse, either of the injured lung, or of the contralateral lung if the patient is kept lying on his sound side

On both counts, morphia (given in doses sufficient to ease pain but not to abolish the cough reflex) is seen to be a drug of the first value in wounds of the chest Moreover, firm and active support of the patient's thorax, while he has what he calls a good cough periodically to clear the air-passages, is an important detail in treatment If a patient with a wound of the chest can be sat up or propped up, he is more comfortable than lying down The reason is that more blood collects into the splanchnic area, and congestion is lessened The lungs are thus less rigid, and can be stretched more in inspiration before the Hering-Breuer reflex comes into play, with the result that breathing is less shallow and rapid, and vital capacity is increased

Discussing pneumothorax, Dr Coope pointed out that in open pneumothorax the mediastinum flaps to and fro, with consequent irregularity of return of blood to the heart via the great veins, and therefore marked inequality of systolic output The grave danger of tension pneumothorax was pressure on the great veins, again with interference of return of blood to the heart The patient's vital capacity is obviously an important prognostic factor in wounds of the chest An old patient with already badly damaged lungs and a poor vital capacity, for example, was killed by a pneumothorax, which did not produce a positive intrapleural pressure, the alteration being only from — 8 mm to — 2 mm

Physical signs in wounds of the chest are not so much equivocal as unfamiliar The breaking of a number of ribs, for example, entirely alters the thoracic cage as a vibrating percussion instrument Subcutaneous emphysema produces its own signs which may obscure those of underlying lesions The frequency of œdematous exudations and bleeding into the bronchi and alveoli make adventitious sounds extremely common in chest injuries

INJURIES WITHOUT EXTERNAL WOUNDS

Mr **Ronald Edwards** discussed the treatment of chest injuries without external wounds Fractured ribs were, he said, a common feature of civilian accidents, and their treatment was the same under war-time conditions. The complications of hæmothorax and tension pneumothorax must however be watched for The position of the apex-beat of the heart was probably the most important sign in all chest injuries; if this was found to be displaced, there was a rise of intrathoracic tension which needed correction Tension pneumothorax was treated by inserting a wide needle through the second or third space anteriorly and connecting this to an under water seal bottle The tear in the lung usually became sealed off in 24–48 hours Empyema may supervene Hæmothorax may need aspiration Fractures of the cartilages, which may cause continuous pain, were frequently missed. Strapping, as for fractured ribs, would cause healing in 3–4 weeks Fractures of the sternum, particularly if transverse, were usually associated with a crush fracture of the spine, and their treatment was that of the spine A depressed fracture may need elevation, but an uncomplicated fracture was best treated by many layers of strapping from the axilla to the opposite clavicle A direct blow on the sternum may cause severe shock due to trauma to the heart

Stove-in chest, in which a considerable number of ribs were fractured in two places giving rise to an area of the chest that moved paradoxically with respiration, caused severe shock, dyspnœa, cyanosis and hæmoptysis. Breathing took place from one lung to the other The paradoxically moving area must be controlled by a firm pad and strapping encircling the chest Continuous oxygen therapy by BLB mask was necessary, morphia and atropine should be given in considerable doses, the latter to control the excessive secretion from the alveolitis and bronchitis secondary to the extravasation of the blood into the traumatised lung Dextrose (30%) 20 c cm intravenously 4-hourly was valuable to control the tendency to pulmonary œdema It is important that the nurse should be instructed to stand behind the patient with her hands firmly gripping each side of the chest and encourage the patient to cough Without this support he is usually unable to do so and may drown in his own secretions The procedure should be repeated every half hour Cardiac damage was frequent, tachycardia, irregularity, low diastolic pressure, bruit due to ruptured valves and dilatation of valvular rings all may be noted and need the cooperation of a cardiologist Transfusions in such cases should be given with the greatest circumspection Rupture of abdominal viscera may occur at the same time, though the diagnosis is made extremely difficult by the fact that there may be reflex rigidity of the abdominal wall, acute dilatation of the stomach, and paralytic ileus, all secondary to irritation of the intercostal nerves Any increased intra-abdominal tension must be energetically treated, as the main respiration in these patients is diaphragmatic. Traumatic asphyxia—a multiple rupture of capillaries due to back-pressure from the great veins—may be present, but in itself calls for no treatment Retinal vessels may be involved leading to blindness, temporary or permanent

Blast lung is due to the compression wave of the explosion striking the chest This wave is of great rapidity, and the chest wall, lung and contained air act as a solid body The alveolar capillaries, being the weakest structure, rupture and produce alveolar and interstitial hæmorrhage There is intense dyspnœa, tachycardia, hypopiesia, and some hæmoptysis with no evidence of external wound Coarse crepitations are heard in the chest The patient is often quite unable to account for his condition Morphia, oxygen, and atropine are indicated Such cases are unsuitable for a inhaled anæsthetic, and blast lung may complicate oth uries that need urgent treatment Local anæsthesia local and minimal evipan must then be employed A eign body may enter the chest via the abdomen, thus ulating blast lung from which a skiagram will tinguish it In such cases an inhaled anæsthetic g cyclopropane) is permissible as the lung trauma is ely to be more localised

Surgical emphysema, unless extremely severe, usually eds no treatment If severe, a wide needle may inserted under the skin and fascial planes and the air lled along towards it Mediastinal emphysema, if nsiderable, may require a thoracotomy and incision the mediastinal pleura, allowing exit of the air via the ural cavity, intercostal tube and under-water seal ttle

MEDICINE AND THE LAW

G M C 's *Erasure Contested*

A PRACTITIONER whose name has been erased from the edical Register has successfully applied to the Divi-onal Court for leave to challenge the decision and for a rection that the decision be annulled He complains at the G M C acted without the "due inquiry" uch section 29 of the Medical Act prescribes and he ks that due inquiry be made The practitioner was -respondent in divorce proceedings in which a husband as granted a decree on the ground of his wife's adultery ne G M C thereafter directed the doctor to appear fore them to answer the charge that, inasmuch as the leged adultery took place while he was in professional lationship with the petitioner's wife, he was guilty of infamous conduct" within the section It will be called that section 29 gives two grounds for erasing a ame—a conviction for crime and a decision "after due quiry" that the practitioner has been guilty of in-mous conduct in any professional respect The M C would be bound by the finding of the criminal ourt in the former case The question now is whether e decree of the Divorce Court is equally binding or hether the G M C can be compelled to retry the issue f adultery The practitioner's solicitors sought to offer esh evidence which was not before the Divorce Court, nceivably the G M C, not being bound by the strict les of evidence, might accept testimony which would e legally inadmissible in a court of law The G M C eating the issue as *res judicata*, declined to sit as a court f appeal from the Divorce Court Thus an interesting nd perhaps novel point arises, did the G M C in accept-ng the result of a judicial inquiry, fail to make that "due inquiry" which the act requires ?

A Swallowed Chicken Bone

A recent Westminster inquest raised the question whether, if a patient complains of having swallowed a bone, the hospital is at fault in omitting to examine him with an œsophagoscope A sergeant in the Army Physical Training Corps, lunching at home on Dec 27, had a choking sensation after taking a bite from a chicken leg He went to a hospital where the doctor, having looked at his throat and seeing no foreign body, gave him a crust of bread which seemed to be swallowed quite easily The patient was told to return in the morning or to report to his own medical officer He came back later in the day and complained of pain in breathing A second examination disclosed nothing alarming and he was again told to come back next morning Dr R M Haines, assistant pathologist to Westminster Hospital, in answer to a question by the coroner, said that the use of an œsophagoscope might possibly have revealed a small flat piece of bone in the patient's gullet The coroner adjourned the inquest for further evidence The doctor who had attended the patient said that he had relied upon his own judgment and examination, some people had a nervous impression that they had swallowed a bone when in fact they had not, even when they had, the passage of the bone was sometimes quite normal He agreed that, on the facts now known, it was likely that the œsophagoscope would have shown the piece of bone Dr Haines, recalled, said that, since the previous hearing, he had come across two similar cases where the swallowing of a bone proved fatal even though it was removed The coroner said that the evidence had been given frankly A doctor who has to make up his mind on the spot, and who makes a proper examination and comes to a reasonable conclusion, is not to be held responsible even if he turns out to have been wrong The passage of an œsophagoscope was "not a matter to be taken light-heartedly" He was satisfied that the action taken did not lend itself to any adverse comment A verdict of death by misadventure was recorded

RICKETTSIAL INFECTIONS IN MAN

CURRENT notes for December of the Army Pathology Laboratory Service deal with the laboratory diagnosis of rickettsial infections in man Man is susceptible to a number of rickettsial infections and it is essential at the present time for all pathologists to have the means of identifying them The chief insect vectors are known and it is often possible to isolate from them the causal rickettsiæ by inoculation into animals The first table in the notes will therefore be of interest to the general reader

Disease	Rickettsia	Geographical distribution	Insect vectors	Possible vertebrate reservoirs
Exanthematic typhus	*Rickettsia prowazeki*	Europe, Abyssinia, North Africa, Belgian Congo, Asia Minor Persia North China, Mexico	Louse *Pediculus humanus*	Man
Endemic or murine typhus	*P prowazeki var mooseri* (= *R muricola*)	worldwide	Rat flea *Xenopsylla cheopis*	Rat (squirrel, shrew)
Tsutsugamushi disease	*R orientalis* (= *R tsutsugamushi*	Japan, Formosa, Malaya, Java, Sumatra New Guinea	Larva of *Trombicula akamushi* (Japan) *T deliensis* (Malaya), *T deliensis* (India), *T minor* (New Guinea)	Bandicoot
Trench fever	*R quintana* (= *R volhynica* and probably *R weigli*	North Africa	Louse *P humanus*	Man
Rocky Mountain spotted fever (Eastern & Western forms)	*Dermacentroxenus rickettsi*	U S A	*Dermacentor andersoni*, *D variabilis*	Goats, hares and other small rodents
Fièvre boutonneuse	*D rickettsi var conori*	Mediterranean zone	Dog tick *Rhipicephalus sanguineus*	Dog
South African tick typhus	*D rickettsi var pijperi*	South Africa*	Tick *Hæmaphysalis leachi*	Dog ?
Sao Paulo rural typhus	*D rickettsi var brasiliensis*	Southern Brazil	Tick *Amblyomma cajennense*	Opossum
Q fever	*Rickettsia burneti* (= *R diaporica*	Australia, U S A	Ticks *Hæmaphysalis humerosa*, *Dermacentor andersoni*, *D occidentalis*, *Amblyomma americanum* *Rhipicephalus sanguineus ?*	Bandicoot

* Tick borne typhus also occurs in Abyssinia and in Kenya where the dog tick *Rhipicephalus sanguineus* acts as vector

---

GUEST HOSPITALS —A ward was opened at the Royal London Ophthalmic Hospital (Moorfields) on Jan 8, by arrangement with the British Red Cross, for sick nurses of the Free French Forces A central hospital with about 100 beds is to be opened by the Norwegian Government in a section of the Craiglockhart Hospital, Edinburgh

Special Articles

WAR WOUNDS OF THE CHEST

Dr ROBERT COOPE on Jan 15 opened a course of lectures on war wounds of the chest, planned by Mr MORRISTON DAVIES and his colleagues of a chest surgical unit E M S, at the Liverpool Medical Institution, with a consideration of the

ANATOMICAL AND PHYSIOLOGICAL BACKGROUND

A surface for the absorption of oxygen and excretion of carbon dioxide whose area is more than half that of a tennis court is, he remarked, packed neatly into the comparatively small volume of the lungs, the air-passages and their subdivisions being the channels whereby the air is brought into effective contact with the blood capillaries in the alveoli of well-defined and corresponding geographical areas Seeing that the dome of the diaphragm projects well upwards, wounds of the lower thorax may easily involve the abdomen as well, and bleeding into the pleural cavity may therefore on occasion come from the liver Wounds which damage the bony framework of the thoracic cage may not only tear the arteries under the ribs, but also drive jagged pieces of bone into the lungs, causing laceration of and bleeding from the lung, pneumothorax and often subcutaneous emphysema Bleeding from the lung itself tends to cease spontaneously, partly because of the low blood-pressure in the pulmonary system, and partly because the laceration may be sealed as the lung contracts down If such a lung is allowed to re-expand too soon, the imperfectly healed tear is opened up again and bleeding recurs

While the lungs and visceral pleura are insensitive to pain, the parietal pleura and the periosteum of the ribs are richly supplied with pain nerves If one or more ribs have been damaged by crushing, bullet or high explosive fragments, pain is severe, continuous and made agonising by deep respiration or by coughing So the breathing is quick and shallow, and inspiration is cut short by a painful grunt This rapid, shallow, incomplete breathing produces a greater or lesser degree of anoxia, with resultant cyanosis, and at the same time carbon dioxide is washed out of the blood So the cyanosis becomes mauve and not deep purple, and as the condition worsens livid or leaden—an indication of dangerous anoxia Early oxygen administration is called for, therefore, to prevent the development of serious anoxia Moreover, coughing is even more painful than breathing, so that the patient does not clear his bronchial tubes Hence the frequent development of obstruction of a bronchus by a plug of mucus, mucopus or blood clot, with resulting absorption collapse, either of the injured lung, or of the contralateral lung if the patient is kept lying on his sound side

On both counts, morphia (given in doses sufficient to ease pain but not to abolish the cough reflex) is seen to be a drug of the first value in wounds of the chest Moreover, firm and active support of the patient's thorax, while he has what he calls a good cough periodically to clear the air-passages, is an important detail in treatment If a patient with a wound of the chest can be sat up or propped up, he is more comfortable than lying down The reason is that more blood collects into the splanchnic area, and congestion is lessened The lungs are thus less rigid, and can be stretched more in inspiration before the Hering-Breuer reflex comes into play, with the result that breathing is less shallow and rapid, and vital capacity is increased

Discussing pneumothorax, Dr Coope pointed out that in open pneumothorax the mediastinum flaps to and fro, with consequent irregularity of return of blood to the heart via the great veins, and therefore marked inequality of systolic output The grave danger of tension pneumothorax was pressure on the great veins, again with interference of return of blood to the heart The patient's vital capacity is obviously an important prognostic factor in wounds of the chest An old patient with already badly damaged lungs and a poor vital capacity, for example, was killed by a pneumothorax, which did not produce a positive intrapleural pressure, the alteration being only from — 8 mm to — 2 mm

Physical signs in wounds of the chest are not so much equivocal as unfamiliar The breaking of a number of ribs, for example, entirely alters the thoracic cage as a vibrating percussion instrument Subcutaneous emphysema produces its own signs which may obscure those of underlying lesions The frequency of œdematous exudations and bleeding into the bronchi and alveoli make adventitious sounds extremely common in chest injuries

INJURIES WITHOUT EXTERNAL WOUNDS

Mr RONALD EDWARDS discussed the treatment of chest injuries without external wounds Fractured ribs were, he said, a common feature of civilian accidents, and their treatment was the same under war-time conditions The complications of hæmothorax and tension pneumothorax must however be watched for The position of the apex-beat of the heart was probably the most important sign in all chest injuries; if this was found to be displaced, there was a rise of intrathoracic tension which needed correction Tension pneumothorax was treated by inserting a wide needle through the second or third space anteriorly and connecting this to an under-water seal bottle The tear in the lung usually became sealed off in 24–48 hours Empyema may supervene Hæmothorax may need aspiration Fractures of the cartilages which may cause continuous pain, were frequently missed Strapping, as for fractured ribs, would cause healing in 3–4 weeks Fractures of the sternum, particularly if transverse, were usually associated with a crush fracture of the spine, and their treatment was that of the spine A depressed fracture may need elevation, but an uncomplicated fracture was best treated by many layers of strapping from the axilla to the opposite clavicle A direct blow on the sternum may cause severe shock due to trauma to the heart

Stove-in chest, in which a considerable number of ribs were fractured in two places giving rise to an area of the chest that moved paradoxically with respiration, caused severe shock, dyspnœa, cyanosis and hæmoptysis Breathing took place from one lung to the other The paradoxically moving area must be controlled by a firm pad and strapping encircling the chest Continuous oxygen therapy by BLB mask was necessary; morphia and atropine should be given in considerable doses, the latter to control the excessive secretion from the alveolus and bronchitis secondary to the extravasation of the blood into the traumatised lung Dextrose (30%) 20 c cm intravenously 4-hourly was valuable to control the tendency to pulmonary œdema It is important that the nurse should be instructed to stand behind the patient with her hands firmly gripping each side of the chest and encourage the patient to cough Without this support he is usually unable to do so and may drown in his own secretions The procedure should be repeated every half hour Cardiac damage was frequent; tachycardia, irregularity, low diastolic pressure, bruit due to ruptured valves and dilatation of valvular rings all may be noted and need the cooperation of a cardiologist Transfusions in such cases should be given with the greatest circumspection Rupture of abdominal viscera may occur at the same time, though the diagnosis is made extremely difficult by the fact that there may be reflex rigidity of the abdominal wall, acute dilatation of the stomach, and paralytic ileus, all secondary to irritation of the intercostal nerves Any increased intra-abdominal tension must be energetically treated, as the main respiration in these patients is diaphragmatic Traumatic asphyxia—a multiple rupture of capillaries due to back-pressure from the great veins—may be present, but in itself calls for no treatment Retinal vessels may be involved leading to blindness, temporary or permanent

Blast lung is due to the compression wave of the explosion striking the chest This wave is of great rapidity, and the chest wall, lung and contained air act as a solid body The alveolar capillaries, being the weakest structure, rupture and produce alveolar interstitial hæmorrhage There is intense dyspnœa, tachycardia, hypopiesia, and some hæmoptysis with no evidence of external wound Coarse crepitations are heard in the chest The patient is often quite unable to account for his condition Morphia, oxygen, and atropine are indicated Such cases are unsuitable for inhaled anæsthetic, and blast lung [illegible] complicate or they may, the Bensons' work endures; many a poor olar will benefit from A. C.'s writing—an unknown der sent him over sixty thousand pounds to do what liked with, a fascinating story that—and I venture prophesy that since human minds are ever and rdinately delighted by little things, like Jane Austen racters modernised to our time, the figures of Miss pp and Lucia with their shopping baskets will glide tily and smile-provoking and unageing through the tical corridors of our great-grandchildren.

* * *

e'd say (if you were Irish) that a man ud have enough ble with the war itself without having to do simul- eous battle with the elements. During a recent pestuous afternoon I noticed the dustbin rolling nkenly round the garden. While we were having tea were appalled to see our chicken-house blown flat. luctantly but gallantly I went to the help of my wife o wanted to set it up again. Obviously this could y be done on the leeward side of the house. Taking one of the walls I tried to carry it but the wind catch- it as it might have been a sail spun us both round and pled us over. What, I wondered to myself as I rose zily to my feet, happens to sandwichmen in a high d? Finally we had to drag roof and walls into a sheltered ce only to find, to my relief I may say, that several vital nks were fractured and that the house could not be re- cted until these had been repaired. The domestic fowl conservative bird. If accustomed from an early age roost in a certain place she expects to do so for ever ether or no there is a roof over her head. We watched dozen disconsolate pullets growing comatose as they at roosting-time, standing around the old site as if ting for an imaginary pub to open. Attempts to herd em into temporary quarters in the garage caused them scatter wildly in the gathering dusk. All the corn d clucking noises in Egypt wouldn't bring them to- ther again so there was nothing for it but to hunt them one by one in the dark and rain with a pocket torch. e found them in the most unexpected places. Two had ncealed themselves in the front porch and pecked me vagely before being captured; another was perched rosely on the handlebars of my daughter's bicycle d a third had climbed into the bitch's basket, much the astonishment of the puppy who could make thing of this strange bedfellow. One wise old virgin d secured a warm and sheltered position on top of the od-heap where we let her bide. Most of those dis- vered surrendered without a struggle and allowed emselves to be carried across the garden and set down ntly on improvised perches. Wisely we did not count r chickens until they were cached and found that all t three could be accounted for. These must have ent an uncomfortable and sleepless night in the vender hedge but turned up looking a bit red-eyed and dignant in time for breakfast next morning.

* * *

Mention of a colleague's efforts as a veterinary surgeon y the way wasn't this illegal ?) prompts me to tell my t story, which I have often inflicted on dinner-party eighbours only to receive incredulous gurgles. We ossessed at the time a fine half-Persian lady, very wild hen we took her over from a convent where her nnihilation of the poultry proved resistant to all the ower of prayer. I had several times removed bones tuck in her mouth and was always surprised at her ocility on these occasions. Moreover "her career of nbridled motherhood," as Elizabeth of garden fame has ut it, had afforded me some obstetric experience and lenty of opportunity for observation in comparative ædiatrics. In other words she never minded my essing about her kittens however young. One day here was a mew at the door and there she was—with a riend. Both entered and rubbed against my legs as a ign of greeting. The friend had a nastily infected eye. his I proceeded to bathe and after a dish of milk the atient retired, returning daily for the irrigation until the ye was well again. Then he disappeared. Now all the ats of the road were well known to us and the patient as a stranger. My theory is that our lady met him one y in his unhappy state and mentioned that she knew a mend man" who would soon put things right. So with his encouragement the ophthalmic patient came along for treatment. No-one ever believes this story, but it happens to be true.

* * *

I was sorry to miss Señor Don Octavio Señoret's luncheon at the Chilean Embassy to the well-wishers of the two Chilean medical scholars attracted here by the British Council. Their high courage in making the long tedious and dangerous journey in these days suggests a most gratifying faith in British medicine. Dr. Orlando Poblete is specially interested in traumatic surgery, of which one can only hope he may not find a surfeit. Dr. Alberto Gallinato we could have wished had been with us in more settled times when postgraduate teaching is more orderly, but if he is willing to probe he will find much hidden metal.

Parliament

FROM THE PRESS GALLERY

School Meals in Scotland

Mr. J. HENDERSON STEWART sought to grasp the nettle of legislation by reference in his three drafting amendments to the Education (Scotland) Bill which was considered in committee on Jan. 20. His amendments proposed the repeal of the Scottish Education Act of 1913 and the incorporation in the new act of its power to provide medical treatment for needy children. But the deputy chairman, Colonel Clifton Brown, ruled that an amendment dealing solely with provision of medical treatment of children was outside the scope of the present bill and therefore out of order. Baulked at his first attempt Mr. Henderson Stewart returned to the charge with another amendment, no less than to make the provision of clothing and food part of the educational system of Scotland. He moved to leave out the section of the bill empowering an education authority to recover from parents who cannot afford to pay the cost of the food and clothing supplied to the child. Mr. G. M. GARRO JONES and Mr. T. MAGNAY supported the amendment if not each other. But Mr. T. JOHNSTON, secretary of state for Scotland, said that if we could feed all the children there was a lot to be said for defraying all the cost. But we had neither the equipment nor staff to feed more than about a quarter of the children. He looked forward to the day when we could develop our nutritional facilities but this bill only set out to abolish the long and humiliating rigmarole of procedure that must at present be followed before the necessitous child is fed, and to see that after feeding these needy children our communal feeding centres were used to the maximum of their ability by the other children whose parents can pay in whole or part for their meals. The bill finally passed through committee without amendment—perhaps because so many argumentative Scots were marooned in their own country. But it was a pity they were "unavoidably prevented" from taking part in this discussion which showed our desire to do as much as we can for Scottish children today and even more tomorrow.

QUESTION TIME

Rehabilitation of the Disabled

Replying to a question Mr. ERNEST BEVIN said: The interim war-time rehabilitation scheme which I announced on Oct. 23, 1941, is progressing satisfactorily and the Government have now decided in principle on two further developments. First, as an immediate war time measure, they propose to provide for the rehabilitation and training for employment of disabled persons who are not provided for by the interim scheme. Second, they have decided to prepare as soon as possible comprehensive measures for the rehabilitation, training and resettlement of disabled persons generally, for introduction as soon as possible after the end of the war. Both these schemes will make provision for disabled persons of all categories, irrespective of the cause of their disability. The Minister without Portfolio and I are now engaged in consultation with the other ministers concerned in an active investigation into the best means of carrying these decisions into effect.

Mr. H. BROOKE asked the Minister of Health whether there were any arrangements under the Emergency Hospital Scheme whereby seriously injured persons, after leaving hospital, can obtain further specialist treatment or supervision

In England Now

A Running Commentary by Peripatetic Correspondents

CONSIDERING that women differ from men even in such tiny details as the distribution of hair on their big toes it is not surprising that in the matter of medical practice with all the important sex-linked genes in play the difference should be profound. Recently I did a locum for a woman practitioner and walked into an alien atmosphere, where, incidentally, I felt most inadequate. Her patients loved her, not in the way they may love the old-man physician or priest, a lesser form of God-worship, but rather as they might love their old nannies with a big spot of the confidence for the family solicitor thrown in; a very helpful and important member of the team against illness, but not its supreme autocrat. With all women's centuries of cooking experience I expected to find some cunning dispensing going on, but I was disappointed—she relied almost entirely on stock mixtures, like buying cooked meals. Is this exceptional? Another point—when she was telling me about the cases there was a curious lack of sequence in her accounts. "Poor old Jones has got a belly full of fluid and has strange attacks of giddiness and I believe he rather liked his liquor." Whereas a man would have said, "Jones drank a hell of a lot, got cirrhosis and a high blood-pressure." To a male mind this seems more logical, but the less consequential female point of view does prevent one from getting fixed ideas, keeps the whole question open, which facilitated the discovery that the salient point about poor old J. was that he was a manic-depressive. While I was writing this an item came through on the wireless: "Mr Eden would not at present consider the admission of women to the diplomatic or consular services." Mr Eden would not consider. Is it because male diplomacy has been so successful, his systems of finance and production have worked wonderfully, so that the fair earth with its abundant fruits basks in peace and happiness? It is high time someone wrote this brutal truth. God may be asexual, man may ape his God with a merely saccular attachment to the fecund earth, but deeply embedded in women are the primal seeds and needs of humanity, and her voice has got to be heard in the ordering of the earth and the urgencies thereof.

* * *

Last year when I went to view the shelters the snow was on the ground; this year it was in the air as well, so I was blamed for it. The Pacifist Service Unit was kind enough to greet me as an old friend. The shelters were strangely different; my friend the shelter nurse has married and gone; the hum of crowded quarters has sunk to hollow echoing, as the few determined shelterers settle themselves in for the night; the lighting is better and makeshift latrines have given way to chemical closets or porcelain pans, water flushes and hygiene. This is all to the good; if the raids begin again, the shelterers have decent quarters waiting for them; but so perverse is the human mind that I half regretted the strenuous good-humoured spirit of the blitz months. One or two play centres were to be seen, but the snow, no less than quiet nights, was keeping the children at home. I saw a few making some astonishing rugs, and I visited the space set aside for painting and organised games. The paintings, as usually happens with children's work, took one aback by their vigour. One drawing of footballers, apparently viewed from mid-air at an angle of 45° to the ground and the goal-posts, was especially lively and clever. The shelter under the church was so well lighted this year that it was easy to read the names on the vaults which flank it, their doors locked upon dead Londoners. My companions pointed out almost affectionately an ancient stone announcing "The family vault of Mr Pigg." Bunks have replaced the benches of last year, and now Mr Pigg sleeps no more quietly than the families who share his taste for a vault. The P S U have lost some of their occupations. They no longer clean the shelters, that being now a municipal job; and they no longer carry the affairs of many homeless people on their shoulders: alternative accommodation has been found for those remaining residents of Stepney who may find themselves bombed out in times to come. The unit has also lost—to another region—a leader whose mind seemed to be perm hotching with plans for social activities. Still, they finding things to do and are ready for more furniture to remove, as people come back to return to their mended homes, and house decorating old people who cannot manage it; and there are rounds to make of the shelters with an offer of to anyone who needs it. And the unit welcomes a as warmly as any company I know.

* * *

Once I used to be very proud when any journal published anything of mine, and used to wonder whether I could afford twenty-five reprints, and give them to seniors who thanked me and told me how interesting paper was. This had a bad effect when I began to on and ordered quite a number of reprints and them widely. Then came the time when I thought I wrote so important that I ordered reprints in —large numbers cost little more than a few, and I could thereby tell the world. I sent off a dozen of them and rest got stacked in an old cupboard. Now again I proud when any paper publishes anything I write, I do not order reprints. I know that a few will be ested in what I write and will tear the pages out or a note of the reference. To the people who send postcards asking for a reprint I reply that I have none made and get a kick out of telling them that if they want a copy they can get one by buying the such a price from such an address. I can almost hear the sighs of relief of those others to whom I used to send reprints. They meant to read them, they put them aside and there they lay until their wives or mothers turned them out for the salvage. And so today my patriotism marches with my wish. I do not order reprints and thereby save the paper; when I receive one, I forthwith send it to the pulper with which to make munitions and I am turning out all the stacks of reprints of for this same reason, and to minimise the risk of fire if my house gets set alight. The money I don't spend on them goes into savings, like my wife saves 10s 6d every time she doesn't buy that attractive new hat. A putty medal would meet the case, I think, for the Minister of Supply doesn't seem to care about putty.

* * *

E F Benson's last book, "Final Edition," publ after his death, deals largely with his own family and will interest medical readers. The father, Archbishop Benson, we are told, suffered from fits of intense de but at other times was a dynamic personality. Mrs Benson was a lake of placidity and commonsense, qualities which no doubt the Great Eugenist made attrac to—and attracted by—the cyclic nature of her The four children who reached adult life were all in two ways that are so often mutually exclusive, scholarship and in imagination, in word-proficiency visual imagery, and seem to have had a Mendelian ratio of predestiny. A C, Eton master and Master of Magdalene, was a prolific writer and among much else left a diary of four million words which was not to be p for 50 years, although he was completely inactive in nursing-homes during long periods of depression. E F seems to have most nearly resembled his mother, but suffered from arthritis for the last 20 years of his life. How often does a bodily complaint, especially a painful one, seem to be a variant of—or indeed a counterirritant to—a faulty mental gene! The sister Maggie after showing early brilliance was certified, while Hugh, Roman priest and author, died of angina comparatively young, and we do not know how he would have stood the testing years and male climacteric even in his self-sought sheltered calling. We are told that he never set much store on human relationships, and I think that this book too could not have been written by one with ary emotional endowment; at any rate what is probably protective emotional atrophy seems to have sterilised this generation of Bensons as effectively as the most ardent eugenist could desire. This book has left me chewing over problems. Is all skilled, sustained work fever heat done by hypomaniacs? If I had the should I dare to be one of these gifted, menaced people? Unlike the bees whose leaders breed while the w are sterile, in man is it the function for the workers breed, while the leaders, in thought at any rate, tend sterility? Is this a levelling p e these

Letters to the Editor

MEDICAL PORTRAITS

R,—The council of the Royal College of Surgeons ngland wish to bring up to date the large collection ortrait-engravings and photographs of medical men h has been formed in the college library in the course ears May I, through your columns appeal to all ws and members of the college and assure them that of their photographs will be very gratefully appre-ed by the president and council and will be duly nowledged if sent to the librarian at the college

oyal College of Surgeons,
coln s Inn Fields, W C 2

W R LE FANU
Librarian

GINGIVITIS IN THE FORCES

IR,—In view of the present incidence of gingivitis in forces and civilian population, it might be of value ake known some preliminary impressions based on 50 cases admitted to hospital

ur investigations of ascorbic-acid excretions indi-d vitamin-C subnutrition in an important proportion ur cases of gingivitis and at the stage at which we our cases there was almost invariably an associated gival sepsis Gum and throat swabs seldom ealed a Vincent's infection *Streptococcus viridans* non-*viridans*, and *Staphylococcus albus* and *aureus* e usually reported The bacterial invasion of is produced a septic gingivitis or septic gingivo-natitis On admission, the vast majority of our es had turgid, hæmorrhagic, painful and infected ns with a fœtid purulent discharge at the gum mar-s It was apparent from the case-histories that the ially swollen and bleeding gum, with its lowered stance, had soon become infected where treatment delayed Recovery is greatly expedited by immedi-local and vitamin therapy Where diseased teeth e present there was a maximal gum lesion around m, and at the site of malplaced, unerupted or partially pted wisdoms there were often well-marked radiating derness, ulceration and an area of stomatitis

n view of the demonstrated vitamin-C deficiency in a nber of our cases, it is our practice to administer large es of vitamin C and immediately to institute local atment With test doses of ascorbic acid, employing dichlorophenolindophenol titration method of esti-ition, we have found ascorbic deficits of the order of 00–4000 mg or more The following dosage is then ggested where the exact requirements of the patient nnot be ascertained During the first week, three mg tablets of vitamin C t d s , during the second ek, one or two tablets b d , and thereafter, one tablet ily Although these are adequate for subscurvy, iere a more advanced scorbutic condition exists, or iere there is pyrexia, larger doses might be required ir cases did not show clinical evidence of generalised irvy, nor were they pyrexial Apart from biochemical say, investigations for scurvy proved negative

The usual local treatment consists of the twice daily plication of chromic acid, copper sulphate, or some senical preparation in suitable strengths We have und gentian violet 2% in normal saline particularly ective, though unsightly The preparation must be plied to the interdental spaces by soaking pledgets of tton wool in the solution and probing them into these aces where possible Potassium chlorate lozenges, outh-washes before the applications to the gums, and senical injections may of course be given Dental tractions considered necessary should be deferred until y gross lesion has subsided

A study of the diets of individual patients sometimes itself suggests a lack of vitamin C On the whole, lequate vitamin-C containing foods seem to be avail-ble in the army dietary, but they are not necessarily nsumed in sufficient quantities Moreover, a few of ur patients fed in civilian billets and their diets were not tisfactory The considerable majority of our patients clared that their intake of vegetables in the army was ss than their consumption in civil life, quite apart from e absence of fruit

Vitamin-C insufficiency in our cases may of course be erely the reflexion of a more universal low nutritional level That low ascorbic values are by no means confined to cases manifesting gum lesions was evident in our vitamin-C evaluations of soldiers with no apparent gingival disease or clinical suggestion of scurvy. It would be of interest to assess the vitamin-C nutritional state of members of the forces in general with a survey of factors which are relevant to the vitamin-C content of their food such as the freshness and methods of cooking vegetables Should an increase in vitamin-C consumption be indicated, the most satisfactory remedy would appear to be antiscorbutic tablets but it is unlikely that the pharmaceutical houses could meet such a demand at present

Attention has been drawn to the possibility of subscurvy in patients who do not respond to treatment of wounds and septic states, this should also be borne in mind

Birmingham

FREDERICK STUHL
JAMES B COVENTRY

GLANDULAR FEVER WITH JAUNDICE

SIR,—Dr Carter and Dr Gold have added two more to the reported cases of glandular fever with jaundice (*Lancet*, Jan 24, pp 102 103) Since describing my own two cases (*Ibid* 1941 ii 480) I have seen 3 more cases of glandular fever in each of which bile was passed in the urine although skin jaundice was absent The bile was passed over 3–4 days during the pyrexial stage while glands were enlarging The diagnosis in each case was confirmed by a positive Paul-Bunnell reaction Although frank jaundice is uncommon in glandular fever probably daily testing of the urine would quite often reveal latent jaundice, if this proves to be true the *finding of bile in the urine might* become an accessory diagnostic factor

Cambridge

LAURENCE MARTIN

NEUROSIS SIMULATING MENTAL DISORDER

SIR,—In addition to the considerable interest of its topic, two other qualities appealed to me in the article by Dr Cook and Dr Sargant in your issue of Jan 10 (p. 31) It was brief and it was very readable But if the authors had added another short paragraph giving some additional details arising out of the informative material they discussed it would have increased at least for me, the interest and value of the paper Can they, please, let us know how many diagnostically doubtful cases there were in the original group selected? What were the ages and diagnoses of the eight cases sent to the neurological centre for treatment and also of the two cases returned to their units?

Harley Street, W 1

FREDERICK DILLON

FUTURE OF MEDICAL RESEARCH

SIR —Dr Walther, in his article of Dec 27, states his view that "there is no special virtue in whole-time research work" and suggests "a part-time arrangement whereby anybody being paid by the state should be allowed sufficient spare time to do research if the facilities exist for it" This suggestion, for me, has not a practical ring and indeed seems nebulous To estimate the special virtues of whole-time research would require a survey of the outstanding discoveries made in medicine and its allied sciences, and the conditions under which they were made I believe that the type of mind which is genuinely and primarily interested in research, desirous of pursuing it, and which shows at least a spark of originality is decidedly rare These rare men selected by a body like the Medical Research Council, should in my opinion be secured for whole-time research and their livelihood assured One has seen this type caught up in administration and routine hospital duties striving to do some research work in spare time. a pathetic spectacle Such men are dogged by a sense of frustration Dr Walther further suggests the "organisation of teams of general practitioners, with the use of laboratory facilities, to carry out research on minor ailments" This, I think requires elaboration and illustration These overworked men would surely have to be relieved of their work for quite an appreciable time and would need training before they could put to proper use laboratory facilities I think the views of general practitioners are needed on this suggestion One of the most useful which they required —Mr E BROWN replied Apart from the general provision for enabling air raid casualties and civil defence workers injured on duty to obtain all necessary further medical treatment either at an outpatient department or from a general practitioner, special arrangements have recently been made for following up certain types of injury amongst those patients as well as ex Service patients where the process of recovery is usually prolonged and needs to be supervised I am advised that the cases where this procedure is particularly desirable are those treated in special centres which involve peripheral nerve injury, head injury or chest injury as well as plastic and jaw cases and certain types of orthopædic cases The follow up will be carried out by asking the patients to come up from time to time for re examination, and, if necessary, further treatment, either at the original centre or at one more convenient for his place of residence, and by keeping careful records of his progress in a standard form as advised by the appropriate consultant adviser I am issuing a circular to hospital authorities on this matter The special organisation already set up for dealing with fracture and orthopædic cases was described in the reply which I gave on Jan 8

Hospitals and the National Loaf

SIR ERNEST GRAHAM LITTLE asked the Minister whether he would indicate the date, and the terms of the instruction, upon which the hospitals under his control had adopted national wheatmeal bread , and whether, before issuing this instruction, he ascertained that the loaf, the consumption of which at the hospitals was thus enforced, was prepared in accordance with the directions stipulated by the Medical Research Council —Mr BROWN replied No instructions have been given in this matter by my department to any hospital but certain recommendations were made to local authorities and to voluntary hospitals in the Emergency Hospital Scheme, in circular 2407 No independent analysis of the bread to be supplied to such hospitals was made by my department

Supplies of Vitamins

Captain G S ELLISTON asked the Parliamentary Secretary to the Ministry of Food whether considering the importance of vitamins in modern medical treatment he would remove his restrictions on the use of these products for pharmaceutical purposes —Major G LLOYD GEORGE replied There are no restrictions on the use of vitamins B_1 and D for pharmaceutical purposes Vitamin A is still available in reduced quantities for pharmaceutical purposes It is not possible to increase the present supply owing to the large demands for this vitamin for the fortification of margarine As regards vitamin C there is no restriction on the use of ascorbic acid for tablets and other "straight" preparations There is however a voluntary restriction with the manufacturers whereby pharmaceutical manufacturers of proprietary brands of multi vitamin preparations are allowed supplies of ascorbic acid on the basis of their average usage in the first five months of 1941 prior to the introduction of the vitamin C control order on June 2 This restriction has been imposed by the Minister of Food with the agreement of the Minister of Health, on the recommendation of the special diets advisory committee of the Medical Research Council

Provision of Nurseries

In answer to a question Mr BROWN said At the end of December 223 day nurseries were in operation in England and Wales , 313 more were approved but not in operation, and 267 were in preparation

Replying to a further question Mr BROWN added In the London region 20 whole time nurseries with accommodation for 828 children are in operation , 44 more with accommodation for 1911 children are approved and will shortly be open A further 92 nurseries are in preparation Figures of attendances are only available at present for 11 nurseries, which have been open for some months In these nurseries there are 406 places and the average attendance at the end of December was 308

In Manchester, 1 war time nursery is open and 6 others are proposed In the rest of the county of Lancaster (including the county boroughs), 18 nurseries are open, a further 24 have been approved, and 16 more are under consideration by the authorities Both in Manchester and in the rest of the county a large number of children under five attend nursery classes in public elementary schools (Miss F HORSBURGH replying to Mr R DUCKWORTH)

Children in Tube Shelters

On the night of Jan 19, 1942, there were 398 children under fourteen sleeping in tube stations used for traffic and 183 in other tube shelters (Mr BROWN replying to Lady ASTOR)

Diphtheria Statistics

Mr BROWN informed Mr S P VIANT that the number of deaths from diphtheria per million children under fifteen years of age was 306 in 1938, 227 in 1939, and 265 in 1940

Typhus in Eastern Europe

SIR FRANCIS FREMANTLE asked the Secretary of State for Foreign Affairs if he had now any information as to the prevalence of typhus, otherwise known as camp or jail fever on the Russian front and in eastern and south eastern Europe —Mr A EDEN replied The information in my possession indicates that there has been a marked increase of typhus on the German side of the Russian front and in eastern and south-eastern Europe No statistics of the number of cases can be obtained

Sir E GRIGG, under secretary to the War Office, replying to a question, said that special measures had been taken to protect our troops in the Middle East against the possibility of an extension of the typhus epidemic outside Europe The measures already taken included arrangements for the supply of vaccine and the setting up of additional laboratories for diagnostic purposes in the Middle East

Quarantine and Man Power

Mr L SILKIN asked the Minister of Health whether his attention had been drawn to the results of investigations carried out by the medical officer of health to the Post Office[1] in connexion with quarantine rules in respect of infectious diseases, which proved that the existing rules of quarantine involved unnecessary idleness, and therefore imposed a needless loss of healthy man-power , and whether he would bring these conclusions to the notice of industry and to all medical officers of health —Mr BROWN replied The conclusions referred to are in general accord with the advice which my department has given for years past when guidance on the subject has been sought My medical advisers and those of the Board of Education have recently given the matter further consideration, and I hope that very shortly the two departments will issue to local education authorities a schedule recommending revised periods of exclusion from school of patients suffering from infectious disease or their contacts As regards industry, I am in communication with the Minister of Labour and National Service

Army Dispensaries

Mr W W WAKEFIELD asked the Secretary of State for War if he was satisfied with the regulations in force in the Army in connexion with the dispensing of medicines and the safe custody and proper labelling of poisons and dangerous drugs —Sir E GRIGG replied Fresh instructions calling attention to the regulations on this subject have recently been issued A simple notice on the care, custody and administration of poisons and dangerous drugs will be posted in a conspicuous position in all medical establishments

Domestic Staffs in Hospitals

Mr DAVID ADAMS asked the Minister of Labour whether in view of the difficulty of retaining members of the domestic staffs at various hospitals in the kingdom, it was intended to apply to these the Essential Works Order —Mr BEVIN replied After consultation with the Minister of Health I am not satisfied that this would in present circumstances be an appropriate method of achieving the object in view

---

[1] See *Lancet*, 1941, ii, 739

WHO'S WHO IN 1942 —The paper shortage which has given so many annual publications a wasted look has had no visible effect on "Who's Who" (London Adam and Charles Black Pp 3452 *70s*), which appears again, portly and informative as a beadle And no wonder, war gives us an opportunity to find out the qualities people, and "Who's Who," always generous to spreads its red covers to embrace them This friend the distinguished is welcome again to our shelves in latest incarnation

Obituary

GRAHAM STEELL

M D EDIN, F R C P

Dr Graham Steell, who died at his son's home in treatham on Jan. 10 in his 91st year had retired in 1911 rom the staff of Manchester Royal Infirmary and the hair of clinical medicine at Victoria University Those ho can look back thirty years recall a physician, a pure consultant, who did everything humanly possible for the sick person, a teacher who passed on to his students knowledge to be gained only by experience, a thorough gentleman, kindly alike to colleague and patient

Graham Steell was the youngest son of Sir John Steell, sculptor to H M the Queen in Scotland born in Edinburgh July 27, 1851 From Edinburgh Academy he proceeded to the university where he qualified in 1872, later taking the gold medal in the M D He was house-physician to G W Balfour and assistant to T R Fraser and was then resident at fever hospitals in Leeds and London, gaining the extensive experience reflected in his ture teaching In 1878 on George Reed's retire-ent the governors of Manchester Royal Infirmary ecided to have a lay superintendent and Steell became M O, holding this office until he was appointed to the aff five years later He soon made a reputation as a acher, publishing two little red books on physical signs, cardiac disease and of pulmonary disease Under his idance the student soon found that the clinical tinct was not easy to attain, but if the road was long id sometimes hard it was worth travelling His mamentarium was simple experience a faculty for servation by eye and ear, a percussion hammer and a ooden stethoscope (called by his name) whose length r outpatient use "was greater than that of a flea-mp" The clinical laboratory, the sphygmomanometer, diology were all in their infancy, the Wassermann action was unknown, differential diagnosis between eurysm and mediastinal tumour, the subject of his radshaw lecture later, was then no easy matter He ed few drugs, but of those he used he was the master If you can't do a patient good," he would say, "be ure that at least you do him no harm"—and remember-g Balfour and Fraser he trusted to Guy's pill "gummi" ni, and even in those days Nativelle's granules, not to ention Christison's mixture, and his clinical clerks arnt quite a lot about strophanthus "Of his keen sight into clinical work" writes E B L, "the following ay be taken as examples He recognised that some astolic murmurs, apparently aortic, are really formed the pulmonary valve and to these his name has been tached He realised early, what is now common nowledge but then was not widely known, that all stolic murmurs at the apex were not due to mitral enosis, but that some were the result of incapacity of e heart muscle to contract the ring from which the alves arose He also described the friction murmur hich occasionally occurs in cases of coronary throm-osis"

Practice came slowly to him at first owing to his ffident manner, but as time went on he came to be the ading cardiologist in the North of England and was immoned in consultation far and wide "It was good know," writes F E T, "how widely his skill and pe of practice were appreciated I had completed term as his house-physician and was spending a eek-end in the Midlands when a local medical officer some repute on being told who was my chief at ice said, 'the purest consultant out of London' This as absolutely true as he never saw a patient without an introduction from a practitioner Working folk in Manchester often referred to him as 'physician Steell' in tones which implied that more than everything had been done for the patient In those days it was more difficult to travel than it is now While he held the chair of medicine he kept a brougham and pair and was the last Manchester consultant to do so Consultations in local towns by train must have been weary affairs, and fees were low Yet Mackenzie, then at Burnley, found time to spend many afternoons in Steell's wards where he saw mitral stenosis cases in much greater numbers than they existed near his home At these visits (Steell not of course being there as it was his consulting hours) it was a privilege to take Mackenzie round and learn to use the polygraph Steell and Mackenzie were fortunate in having in Shaw, the Padiham watchmaker, a man to make the instruments they required When on his retirement from the active staff his former residents wished to give Steell a dinner, he declined because the speech it would have entailed would have been torture to him but accepted the offer of his portrait to be engraved by Mr Percy Martindale Old students of Steell's will ever associate him with his habit of changing into the old frock coat which Sister Reid kept for his entry into the ward the absolute quiet which had to prevail during his lengthy round the little cough which first introduced us to the Brompton lozenge They will remember also the baldness which made his appearance venerable whilst still young (caused it was said by an attack of typhus), and in the intimacy of his home 'Sandy' the Aberdeen terrier"

Steell's delicate frame made it difficult to credit the statement of Edinburgh juniors that he had been champion boxer of the university At all events he soon got the better of the pulmonary tubercle which he developed soon after starting practice In 1886 he married Agnes Dunlop McKie, superintendent of nurses at the infirmary After her death in 1910 he went to live with their only son, Dr Walter Steell, a medical officer of the Ministry of Health

ERNEST ROWLAND FOTHERGILL

M B DURH.

Dr E R Fothergill, who died on Jan 20 at Tunbridge Wells in his 78th year, spent his life in general practice and in maintaining the status and dignity of the general practitioner Born at Ryde, I of W, in 1864, his father came from the Lake District and his mother from South Wales He was educated at Malvern College, studied medicine at Guy's and Newcastle-on-Tyne, and qualified M B Durh in 1895 After holding an appointment at the Durham Co Asylum he practised at Roche, Cornwall, then in Southfields, and finally at Brighton for thirty years Quite early he turned to medical politics and in 1911 became a member of the BMA council When in that year the National Insurance Bill was being fiercely debated he was hon secretary of the influential committee that took its stand on the principle of payment for services His work on the Insurance Acts Committee earned him twenty years later election as BMA vice-president He had an exceedingly fertile mind and many developments in the association's policy and procedure could be traced to his initiative Above all he was absolutely incorruptible, he never sought honours and no temptation of that kind could have deviated him from his course for one moment If he ever acknowledged a leader it was Victor Horsley whose strong regard for constitutional rectitude appealed greatly to him Some people saw nothing in him but a hair splitter, but it was never safe to ignore one of Fothergill's points as many a chairman found to his cost "I knew him probably best of anybody on our staff," writes Dr Alfred Cox, "and had more occasion to curse his infernal ingenuity and persistence (he was a regular bloodhound if he got on a trail) than anybody But no man had more reason to be grateful to him I think it can fairly be said that outside his form of practice, which left him much time on his hands, he devoted the last forty years of his life to what he deemed to be the best interests of his profession and his ideals were very high indeed" During the last few years Dr Fothergill had limited his practice to psychiatry He is survived by his widow, daughter of Alderman G H Dexter, J P, of Gateshead, who has served on the Hove town council

Medical News

University of Wales

At recent examinations the following were successful —

D P H

Part I —Dilys L Davies, Freda M O Graham, Aelwyn Griffiths, Mary D Owen and Margaret R Wade

Part II —R W Thomas

Scottish Conjoint Board

The following having passed the final examination of the board have been admitted licentiates of the Royal Colleges of Physicians and Surgeons of Edinburgh, and the Royal Faculty of Physicians and Surgeons of Glasgow ,—

Bernard Barnett, H L Cahn, Peter Capaldi J B Donald, E M N Dunlop, William Forster, Pamela P Griffith, C L Gunn, J H Hilditch John Hothersall, Israel Hurwitz, Ivan Joffe, J R Kyles, H J Modlin, A F Morgan, Albert Mackie, Malcolm Niven, E A Novick W A Ogilvie Michael Rapoport A O Stein, H N Stein, A B Stewart, G P Toh, Margaret O Withof Keus and Leo Wollman

Luise Wishicki, a graduate of Berlin, a recognised foreign university, was also admitted to the licentiateship

Medical Casualty

W S/Captain A B Waters, M R C S, R A M C, has been posted as wounded

Medical Honours

The M C has been awarded to Captain Leonard Bapty, M B Aberd, R A M C, and Captain J B Heycock, M R C S, R A.M C, for gallant and distinguished services in the Middle East

Captain Heycock was taken prisoner near Sidi Rezegh All through the night he attended to the wounded and in the morning after a counter attack by our tanks, he loaded the wounded into a German ambulance and forced the driver to proceed to our lines

Pharmaceutical Society of Great Britain

On Wednesday, Feb 11, at 2 30 P M, at 17, Bloomsbury Square, London, W C 1, Dr Philip Hamill will read a paper to this society on prescribing in war time

Association of Applied Biologists

At a meeting of this society, to be held at 11 A M on Friday, Feb 20, at the London School of Hygiene, Keppel Street, W C 1, there will be a symposium on domestic entomology, when recent work on the bed bug, head and body lice, and scabies will be discussed Visitors will be welcome

Royal Sanitary Institute

A meeting of this society will be held at Salford on Feb 14 when Mr J A Webb, chairman of the city health committee, will open a discussion on post war public health problems Mr W Albert Walker, the city engineer, will also speak on post-war housing development, Mr G H Walker, the city analyst, on food substitutes and public health, and Mr S Stott, food sampling officer, will describe his experience of the working of the Food and Drugs Act, 1938

Death of Henri Carriere

Dr Carriere, late director of the Federal Service of Public Health, died at Berne on Dec 24 He had represented Switzerland on the Permanent Committee of the International Office of Public Health in Paris for many years

Royal Society of Medicine

A general meeting of the fellows of this society will be held at 3 30 P M on Tuesday, Feb 3 On Feb 4, at 2 30 P M, Dr J D Rolleston will read a paper to the section of the history of medicine on the folklore of the acute exanthemata On the same day, at 2 30 P M, at the section of comparative medicine Mr H T Matthews, F R C V S, Mr R F Montgomerie, PH D, and Mr H H Green, D SC, will open a discussion on the control of tuberculosis in cattle On Feb 6, the section of otology will meet at 10 30 A M when Dr R T Brain will open a discussion on skin diseases of the ear At 2 30 P M, on that day, at the section of laryngology, there will be a discussion on throat and nose manifestation of blood diseases, when Mr W M Mollison and Dr R G Macfarlane will be the opening speakers At the same hour Dr Geoffrey Organe will read a paper to the section of anæsthetics on resuscitation

Royal Institution

On Thursday, Feb 12, at 2 30 P M, Mr C H Wadding Sc D, will deliver a lecture at the institution, 21, Alb Street, London, W 1 He will speak on some biolo discoveries of practical importance

Status of WAAF Doctors

A recent Air Ministry order has authorised W AAF med officers to attend men as well as women, and has granted th equal status as regards seniority and rank with their colleag in the R A F Medical women in the service will now b posted to R A F stations where men and women are em ployed and will be eligible for appointment as station [illegible] medical officers

Lectures at Nuffield Department of Surgery

On Friday, Feb 13, Prof A T Jurasz will give a [illegible] at the Nuffield Institute, Oxford, at 8 15 P M. He will [illegible] on the surgical aspects of bile duct infection On Fe 27 and March 6 Dr Dorothy Russell will speak on the [illegible] anatomy of internal hydrocephalus All the lectures [illegible] at 8 15 P M

Precautions against Typhus

In making their plans to guard against an outbreak of [illegible] in response to the Minister of Health s circular (No 25[illegible] metropolitan boroughs are combining in civil defence gr[illegible] Special staff and premises for the group will operate [illegible] borough, while the remaining boroughs undertake [illegible] disinfection and disinfestation The medical officers of health of Westminster, Chelsea, Kensington, Fulham a Hammersmith have already met and they propose to con trate typhus work for their group at the disinfecting a cleansing stations of Kensington

The Watch on Tuberculosis

Questions in the House of Commons have elicited that t bills of mortality for 1940 compared with those for 1939 sh some increase in the incidence of tuberculosis, especial among women of 15–25 years of age The figures for the fi quarter of 1941 show a slight reassuring decline compared w those for the same period in 1940, but the Minister of Healt anxious that local authorities should see to it that their tub culosis services at least do not fall below peace time standar The Medical Research Council have undertaken for the Mi ster an inquiry into the rise in the incidence of tuberculos and pending their report he urges local authorities (circul 2526) to extend and improve their arrangements for the ca and aftercare of tuberculous patients and their famil From time to time it is possible to release beds in E M hospitals for the use of these patients, and where an author is hard pressed for accommodation the medical officer o health should get in touch with the principal regional medic officer who will give what help he can

Ella Sachs Plotz Foundation

During the eighteenth year of this foundation for th advancement of scientific investigation 67 applications f grants were received by the trustees, of which 49 came fr seven different countries in Europe, Asia and North and Sou America The total number of grants made during the ye was 35 Grants are made to researches on problems i medicine and surgery They may be used for the purchase apparatus and supplies that are needed for special investi tions, and for the payment of unusual expenses incident such investigations, including technical assistance, but not f providing apparatus or materials which are ordinarily a p of laboratory equipment Stipends for the support investigators are granted only under exceptional circu stances The maximum grants will usually be less than $ and applications for the year 1942–43 should be sent bef April, 1942, to Dr Joseph C Aub, Collis P Huntingt Memorial Hospital, 695, Huntington Avenue, Boston, Ma U S A

The fact that goods made of raw materials in supply owing to war conditions are advertised in paper should not be taken as an indication that they necessarily available for export

ORIGINAL ARTICLES

PERITONEOSCOPY

A REPORT BASED ON 125 CASES

R MILNES WALKER,
M.S LOND, F R C S
RGEON TO THE ROYAL HOSPITAL,
WOLVERHAMPTON

P LYON PLAYFAIR,
B CHIR CAMB, F R C S,
M R C O G
ASSISTANT GYNÆCOLOGIST TO
THE HOSPITAL

ENDOSCOPIC examination of the peritoneal cavity ter inflation with air was first considered as a means diagnosis as long ago as 1901, and sporadic attempts widen the scope of its practicability have been made om time to time since then Until recently these tempts have been abortive, but as a result of improveents in the type of instrument used it is now becoming recognised aid in the diagnosis of many abdominal nditions in America

The first attempts were made in Germany by Kelling 902), and in Sweden by Jacobæus (1910), while in 1925 adeau and Kampmeier published a full account of the erature to that date The modern stimulus to the use of e peritoneoscope derives largely from the work of Ruddock, no gave his first account of it in 1934, and a fuller report sed on 500 cases in 1937, his latest figures show that he is used the instrument in 1500 cases (discussion on paper y Robinson and Fiske 1941) His instrument is the one hich has found general acceptance today, and has been iown to be safe in competent hands and to give reliable sults Since 1937, thirty-six articles by twenty-nine ithors have appeared in eight different countries (U S A 25, rgentine 3, U S S R 3, Cuba, Czecho Slovakia, Germany, ithuania and Mexico, 1 each) Starr and Frank (1941) ave lately published a collective review of experience gained America up to date The British Empire has been particularly conservative in adopting the method, there being ly one reference to its use, on which occasion a cystoscope as employed (Short 1924)

THE PERITONEOSCOPE IN USE

Our own interest in the subject was aroused by the per of Ruddock in 1937 In the first instance the enito-Urinary Manufacturing Company loaned an strument with a specially made sheath, in which the tical and lighting system from a cystoscope was used, nce this gave promising results, a complete instrument milar to that devised by Ruddock was manufactured

This consists of a sheath lined by bakelite, 10 mm. in ameter, with a lateral inlet for admitting air, a blunt nted trocar for introduction of the sheath, a collar, l a telescope which carries the lamp When the trocar is hdrawn, the collar and the telescope are inserted so that air tight connexion is made The telescope has an rect vision optical system, giving a wide field directed iquely forwards with slight magnification A suction e is provided for withdrawing ascitic fluid, and additional ruments are available for taking specimens for biopsy solid organs, by means of a diathermy current

e following observations are based on the experience 5 examinations carried out during the last 3½ years ommonly happens with a new method results in early cases were inconclusive and increasing ce in the use of the instrument gave more valuable liable information Ruddock goes so far as to "I don t think a man learns much until he has bout 200" but we have found previous experience the cystoscope or more particularly with the scope, of great value We have been rather ointed in attempts to obtain specimens for , and in this series have only done so in 8 cases, e of these the specimens were too small and the of microscopic examination inconclusive Modis in the apparatus are now being made which rmit us to obtain larger specimens under better

We have attempted no operative procedures apart iopsies, but other workers report on the use of the d for the division of adhesions (Jones 1940) and for lisation by means of fulguration of the fallopian s (Power and Barnes 1941) the most recent addition photographic attachment (Horan and Eddy 1941)

TECHNIQUE

The operation, which is undertaken with full aseptic technique in an operating theatre which can be darkened, may be carried out under local or general anæsthesia In our series 95 were undertaken under local, 29 under general and 1 under spinal anæsthesia General anæsthesia is employed if there is a strong probability that open operation will follow It has been our custom, as a routine, to insert the instrument in the midline a little below the umbilicus, this situation is centrally placed for reaching the limits of the peritoneal cavity, and, unless there has been a previous operation through an incision in this area adhesions are not likely to be encountered, and no large blood-vessels are liable to injury If any other site is chosen, the region of the larger blood-vessels of the abdominal wall must be avoided When local anæsthesia is to be employed an injection of morphia is given beforehand and an area about 2 in in diameter anæsthetised some of the local anæsthetic being injected into the rectus sheath on each side The skin is nicked with a scalpel, and the pneumoperitoneum needle inserted It is usually easy to determine when the needle is in the peritoneal cavity, because it can then be freely rotated about its point of insertion if this freedom of movement cannot be obtained either the needle is not in the correct place or there are adhesions obstructing it and an attempt should be made elsewhere, but air should on no account be injected unless the needle moves freely Air is injected by means of sterilised bellows attached to the needle When ascites is present it is unnecessary to induce the preliminary pneumoperitoneum the trocar and sheath being inserted straight away We have been surprised how little inconvenience patients experience when the peritoneal cavity is relatively quickly inflated or deflated with air After inflation is complete the needle is withdrawn and the nick in the skin enlarged with the scalpel so that it is just adequate to take the instrument, and the cut is further deepened to make a small incision in the fibres of the linea alba The trocar and sheath are then inserted, it is important in doing this to direct its point to one or other side of the midline, so that if it slips into the peritoneal cavity with a jerk there is no danger of injuring viscera against the vertebral column as with the pneumoperitoneum needle it is possible to satisfy oneself that it is in the cavity by moving it freely from side to side The trocar is now withdrawn, and the air escapes If free fluid is present it is wise to withdraw it at this stage since if air is blown through it the ascitic fluid froths and obscures the field of vision When the telescope is being passed down the sheath the abdomen is reinflated so that the lens does not come in contact with the viscera, if this happens, it is necessary to remove the telescope and clean the lens When the examination is complete the air is allowed to escape before the sheath is withdrawn. Finally the skin is closed with a single stitch Gentle pressure on the abdominal viscera with the end of the telescope causes no discomfort to the patient who as a rule is unaware when biopsy specimens are being taken from solid viscera but care must be taken not to press on the parietal peritoneum since this causes pain

RANGE OF VISION

After a little experience the examiner learns to recognise landmarks; in the upper abdomen the falciform ligament stands out and serves as a guide to the fissure between the lobes of the liver, below the umbilicus, the two folds formed by the obliterated hypogastric arteries are prominent It is not necessary to give a description of the various organs as they appear through the peritoneoscope, their recognition and particularly the recognition of pathological appearances can only be learned by experience The organs which can usually be observed in the normal peritoneum are enumerated below, but it must be realised that particularly in fat subjects omentum may obscure the field of vision and thus limit the scope of the examination All the peritoneum of the anterior abdominal wall parts of the lateral walls the anterior part of the under surface of the diaphragm the anterior surface of both lobes of the

Notes, Comments and Abstracts

CONTROL OF RATS

ERIC HARDY, F.Z.S.

PORTS and cities are carrying large stocks of foodstuffs nowadays, ruined buildings and heaps of rubble provide good breeding places for rats and many gamekeepers skilled in rat-trapping have been called up or have transferred to other work. In the interest of public health it would be wise to check the increase in the rat population which these conditions favour. That black or ship rats, hosts of the bubonic plague flea, have in recent years formed a rising proportion of the rats in London, Cardiff and other ports, does not of course imply a danger of plague. As long ago as 1920–21 the Liverpool School of Tropical Medicine found the plague flea, *Xenopsylla cheopis*, freely on ship rats in the port,[1] but there has been no outbreak of bubonic plague because the fleas were not infected. Cases of plague occurring among Lascar seamen visiting Liverpool were quickly detected and controlled by the port health authorities. Nevertheless large numbers of rats harbouring the plague flea would be an unwelcome population.

Rat control in war-time is hampered not only by conditions favourable to the rat but by lack of many of the most effective lethal agents. Thus red squill, one of the commonest and safest poisons, is scarce because it is imported; sheet metal, used for rat-proofing buildings, is not to be had; and it is almost impossible to use strychnine (much favoured in America) because of the 1911 Protection of Animals Act. Asbestos and three-ply wood, however, do very well for rat-proofing; and white arsenic—used in quantities so small that it cannot endanger human life—is perhaps the best substitute for strychnine. Government rodent control representatives are finding it necessary to work in close cooperation with the municipal and sanitary authorities, because rats make great use of sewers as highways. Business houses should show a greater sense of responsibility for rat control, and provide more traps and fresher poison baits. The suggestion of the Ministry of Agriculture that there should be ten times as many traps as there are rats is by no means an exaggeration. Set with skill, traps can be highly effective even when unbaited. The use of virus to destroy rats rouses conflicting opinions. Rodents seem to become immune after a time, so that results are seldom permanent. Moreover, cases have been recorded where illness in humans seems to have resulted from bacteriological preparations used for killing rats and mice. An outbreak of enteritis among the employees of a London firm has been attributed to the use of a rat virus in the building.[2]

Skilled ratcatchers are getting scarce and it has been suggested that women should be trained for the task. Apart from man-made plans for their destruction rats may suffer from other attacks in war-time. Many of their natural enemies—stoats, foxes, badgers, owls, herons, otters, buzzards and polecats—are destroyed as vermin in the ordinary way by landowners wishing to preserve game. Less game preservation will give such creatures an opportunity to multiply and will help to control the increase of rats and rabbits. Rat-proofing of buildings and fumigation are perhaps the most effective methods of control in the long run, though it is impossible to dispense entirely with trapping and poisoning. The annual reports of the Liverpool port sanitary officials show that compulsory fumigation of ships reduced the average number of rats per ship from 58¾ in 1923 to 1⅔ in 1938; and I have found rat-proofing a valuable protective measure.[3] The Rodier method of rat control depends on upsetting the sex ratio in favour of the males who then exhaust the breeding females so that they die off. In practice this plan does not always work, though at the Manchester Zoo by killing only female rats over a period of 15 years they halved the rat population. The method appears to be cheap but slow. In the countryside trapping and ferreting are successful, but in congested towns, which quickly become reinfested, it is necessary to locate the breeding places and fumigate them, and to use rat-proofing, trapping and poisoning as auxiliary measures.

---

[1] Merseyside Handbook to British Association, Liverpool, 1923.

[2] Ministry of Agriculture Bulletin No. 30, 1932.

[3] Hardy, E. *Food*, October, 1941.

BORN WITH A BANG

LAST winter some of us used to think enviously of drowsy sunlit beaches in mid-Pacific, of abundant fruits, flower necklaces, peace and plenty. But this morbid process, war, has invaded even fabulous Hawaii, and envy gives way to sympathy. In September, not long before the trouble reached them, the first issue of the *Hawaii Medical Journal* had appeared. This handsome publication—such thick glazed paper, such clear large type—is to be published every two months by the Hawaii Territorial Medical Association, which derives its membership from all the islands in the Hawaiian group. The November issue has already reached us. The editorial director, Dr. Lyle G. Phillips, and the editor, Dr. Harry L. Arnold, are assisted by five associate editors. The new journal, replacing the bulletin of the association, is intended to appeal to all doctors practising in Hawaiian Territory, whether members of the association or not. It contains original articles, abstracts and summaries not only on general medical topics, but on those which have a special significance in the islands. We wish the editorial staff well, and look forward, with them, to the time when Hawaii resumes the duties and pleasures of peace.

Births, Marriages, and Deaths

BIRTHS

BONE.—On Jan. 23, the wife of Mr. Alan Bone, F.R.C.S., of Clissold Court, N. 4—a son.

COLLINGWOOD.—On Dec. 13, at Bathurst, Gambia, the wife of Dr. Cuthbert Collingwood—a daughter.

FARQUHARSON.—On Jan. 20, at Gerrards Cross, the wife of Captain Edward Farquharson, R.A.M.C.—a daughter.

BREWER.—On Jan. 24, at Burton on Trent, the wife of Dr. F. G. Brewer—a son.

MURDOCH.—On Jan. 17, at Dumfries, the wife of Major Robin Murdoch, R.A.M.C.—a son.

SPENCER.—On Jan. 23, at Shrewsbury, the wife of Mr. John Churchill Spencer, F.R.C.S.—a son.

WRIGHT.—On Jan. 21, in Edinburgh, the wife of Major James Wright, R.A.M.C., Great Bentley, Colchester—a daughter.

YOUNG.—On Jan. 26, at St. Mary's Hospital, Paddington, to Mary (née Jaques), M.R.C.S., wife of A. W. O. Young—a daughter.

MARRIAGES

GORDON—ALLINGHAM.—On Jan. 24, at Blindley Heath, Surrey, John Gordon, M.R.C.S., flying officer R.A.F.V.R., to Mabel Anne Allingham.

MANSON—POTTER.—On Jan. 17, at Brackley, Charles Noel Sinclair Manson, M.R.C.S., R.A.M.C., to Patricia Bridgman.

STEWART—MUNDAY.—On Jan. 21, at Newcastle on Tyne, Alexander Bryce Stewart, M.B., to Vera Munday, S.R.N.

THOMAS—ACKLAND.—On Jan. 17, at Davyhulme, Francis Brian Thomas, major R.A.M.C., to Katherine Ackland.

DEATHS

BUCKELL.—On Jan. 23, at Shipley, Yorks, Monamy Aston Cornwall Buckell, M.B. LOND., D.P.H.

CARPMAEL.—On Jan. 22, at Guildford, Cecil Edward Carpmael, M.B. LOND., of Dulwich Village.

CHALMERS.—On Jan. 24, at Bridge of Weir, Archibald Kerr Chalmers, LL.D., M.D. GLASG., F.R.F.P.S., D.P.H., aged 85.

EDE.—On Jan. 23, at Leamington Spa, Frances Ede, L.S.A., late of Harley Street, and of Crockham Hill, Kent, aged 90.

FOTHERGILL.—On Jan. 20, at Tunbridge Wells, Ernest Rowland Fothergill, M.B. DURH.

HUMPHREYS.—On Jan. 21, at Wokingham, Berks, Francis Rowland Humphreys, L.R.C.P., aged 83.

KERR.—On Jan. 22, at Hayes, Kent, Arthur Francis George Kerr, M.D. DUBL., D.P.M., late of Bangkok, aged 66.

KIDD.—On Jan. 21, at Chalfont St. Giles, Percy Kidd, M.D. LOND., F.R.C.P., aged 90.

LORIMER.—On Jan. 20, in Edinburgh, Alexander Patrick Gordon Lorimer, M.B. EDIN., F.R.C.S.E., D.P.H., lieut.-colonel I.M.S. retd.

MCDOUGALL.—On Jan. 22, at Fallowfield, Manchester, Percy McDougall, B.SC. LOND., M.B. MANC.

MACKENZIE.—On Jan. 1[illegible], at Auckland, New Zealand, Kenneth Mackenzie, M.D., M.CH. EDIN., F.R.C.S., aged 56.

RITSON.—On Jan. 23, at Reading, Robert Ritson, M.A. CAMB., M.R.C.S., aged 88.

THURSTAN.—On Jan. 19, at Bath, Edward Paget Thurstan, M.D. CAMB., aged 90.

WALKER.—On Jan. 21, in Liverpool, Albert Francis Walker, L.R.C.P.

olon it is less often useful, since operation for the of obstruction is usually required even if there are stases ; but in cases of carcinoma of the uterus an ate may be made of the degree of spread Many conditions can be diagnosed with certainty, and iggest that in all cases of disease of this organ in h the diagnosis is uncertain peritoneoscopy should riously considered Finally, in a great variety of -abdominal and pelvic conditions the method helps ttle points of differential diagnosis and it might be used more in Great Britain

REFERENCES

T N and Eddy, C G (1941) *Surg Gynec Obstet* 73, 273
eus, H C (1910) *Münch med Wschr* 58, 2090
, H A (1940) *Amer Rev Tuberc* 42, 805
g, G (1902) *Münch med Wschr* 49, 21
au, O E and Kampmeier, O F (1925) *Surg Gynec Obstet* 41, 59
r F H and Barnes, A C (1941) *Amer J Obstet Gynec* 41, 038
son, S and Fiske, L G (1941) *West J Surg* 49, 284
ock J C (1934) *Ibid*, 42, 392, (1937) *Surg Gynec Obstet* 5, 623
, A Rendle (1925) *Brit med J* ii 254
, A and Frank, H (1941) *Surg Gynec Obstet* 73, 423

MASS RADIOSCOPY IN FACTORIES

TWO SMALL SURVEYS

A. STEPHEN HALL, M B CAMB , M R C P
TUBERCULOSIS OFFICER TO MIDDLESEX COUNTY COUNCIL

UCH has been written lately concerning the value of s radiography of the chest, and reports, among ers, of investigations into the pulmonary pathology Australian recruits, British sailors and University lege Hospital students are available, but so far little been done in this country with the ordinary elected civilian population Anyone who has felt the e to conduct such an examination must at once have ome conscious of the many difficulties, of which lack uitable apparatus and the reluctance of the popula- n to submit to examination are the chief Neverthe- , few of us doubt that these difficulties will soon be rcome and this report is an account of how they were acked in the district in which I am tuberculosis officer ince early in 1938 I have had a Victor X-ray screening n my consulting-room and my practice is to conduct examination almost entirely by radioscopy, using stethoscope to ascertain the presence of bronchitis pleural friction At first the patients were all radio- phed as well as screened in order to test the accuracy the screening, but I soon found that a high degree of uracy had been attained and so came to place great ance on my screening So far as I know only on o occasions have I declared the screen image to be rmal and the film has subsequently shown a small normality Often, however, the respiratory and other vements of the patient behind the screen have enabled to detect shadows not shown on the film, or to terpret obscure radiographical appearances When, erefore, in the summer of 1940, I was thinking of amining employees of some of the many factories in y district, I naturally felt that radioscopy was the best ethod for me to employ , this opinion was strengthened the lack of any apparatus for miniature radiography the factories There were one or two stationary sets use and a number of experimental camera units in sociation with ordinary X-ray sets, but there was, and no proven, robust transportable apparatus which e could take into a factory with confidence Radio- opy was therefore the method of choice and necessity ermission to undertake the work was obtained from the airman of the public-health committee and the county edical officer, who stipulated that the names of any nployees found to be affected with tuberculosis should t be revealed to the management of the factories ithout the employee's permission

FIRST SURVEY

My first plan was that the workers should attend the inic in batches of 30–50 to be screened, but it soon ecame clear that this would involve serious difficulties transport and would entail considerable loss of working me I therefore suggested to the London agent of the Victor X-ray Corporation that he should lend me a set similar to my own for a short time, and he readily agreed An interview was arranged with the managing director of a firm employing some 400 men and 800 women in a fine modern factory, and I explained to him that of tuberculous patients presenting themselves for examination about 80% were already beyond hope of having the disease made quiescent, and that the outlook was much better if the disease was found in its early stages I then put before him the proposition of examining by X ray the entire staff of the factory After much friendly discussion an agreement was reached I was to conduct the investigation free of charge to the firm, but the examination and any subsequent investigations should take place in the firm's time , the confidential nature of the examination was recognised , and the firm agreed to re-employ any tuberculous employee at the conclusion of the necessary treatment, provided the patient had been rendered non-infectious I tried to persuade the management to continue paying the employees' wages while they were away receiving treatment but this point was not conceded

The next problem was that of acquainting the workers with our plan, and our idea was to employ a good deal of propaganda I thought it best to let them know in simple language the main facts of the problem, and, against advice, was not reticent about the use of the word tuberculosis In the factory was a canteen where at 12 30 every day about 600 of the girls sat down to lunch, and it was decided to hold a meeting there during the lunch hour In the chair was Dr Harley Williams of the National Association for the Prevention of Tuberculosis, and the principal speaker was Dr Edith Summerskill, M P At first there was some indifference among the audience, but by the end of the meeting the girls were crowding round the platform, standing on the tables and chairs, and in various ways testifying to their interest After this meeting visits were paid to each department to enlist the support of the shop stewards , attempts were also made to placate the production managers, whose figures, no doubt, would show a slight fall while the girls were away for examination

The essential clinic work had to continue during this investigation and so we were only able to be at the factory a limited time , we held eight sessions of about 2½ hours each in a fortnight The factory welfare nurse was in charge of the organisation of the attendance of the girls, a task requiring care, for it was important that no one shop should have its number of girls seriously depleted during the session , so a few girls had to be taken from each of several shops This organisation of the attendance of the employees is likely to prove one of the main difficulties in this sort of work, for, although the radioscopic examination occupies rather less than a minute, there is undressing and dressing to be done, and the names, addresses and ages have to be recorded on cards, with the result that there is a tendency towards congestion in the changing-room, or on the other hand the doctor may outstrip the organisation and find himself without patients for a while It is said that miniature radiographic sets can operate at 200 an hour , they may well do so when their subjects are recruits who can be lined up for an hour or so before being passed through, but I can foresee difficulties in organising people in a factory at that rate

Although our appeal had been mainly to the women in the factory, yet after we had been there a few days some of the men asked to be screened and we were willing enough, although it brought our proportion of attendances down, our original intention being to screen the women only

Of the 800 women in the factory 482 submitted to examination of these 2 were regarded as suffering from phthisis, and 5, being doubtful were asked to attend the clinic for observation A number of other thoracic abnormalities were noted, such as calcified spots, Parrot's nodes, bronchiectasis, mitral stenosis, and azygos vein lobes No case of known established tuberculosis was found Of the 400 men, 93 were examined , 1 was regarded as tuberculous and 1 as suspicious , this last man appeared to have silicosis as well and had been for many years a miner in Wales All 3 tuberculous employees accepted sanatorium treatment liver, and usually parts of their under surfaces, together with the anterior surface of the stomach are easily examined. By raising the left lobe of the liver with the tip of the telescope, most or all of the anterior surface of the lesser curvature is available for inspection the fundus of the gall-bladder may be seen and its lower surface up to the cystic duct is exposed by depressing the transverse colon If more than the tip of the spleen is visible, this may be taken as evidence of splenomegaly In the central abdomen omentum tends to hide the intestines but some coils are always visible, and the cæcum and sigmoid colon sometimes present themselves, by adjusting the position of the patient it may be possible to inspect the appendix The pelvic organs are brought into view by placing the patient in the Trendelenburg position, with the bladder emptied, and their examination is facilitated by the assistant placing two fingers in the vagina, and manipulating the uterus and appendages to enable their different surfaces to be seen With the intestines displaced from the pelvis a clear view can be obtained of the fundus uteri, the fallopian tubes and round ligaments, while, when the assistant alters the position of the uterus, the ovaries and the peritoneum covering the anterior and posterior surfaces of the broad ligaments, the pouch of Douglas and the utero-vesical pouch can be examined When adhesions are present or there is a retroverted uterus, however, difficulty may be experienced in seeing the ovaries and posterior layers of the broad ligaments

RESULTS

In general the purpose of a peritoneoscopy is to settle a question of differential diagnosis, or in a case of malignancy to determine the presence or absence of metastases with a view to operability, in some cases both these objects may be our aim It will usually be called for as an alternative to an exploratory laparotomy, and should only be employed when there is a definite reason, it has been proved to be reasonably safe, and will save many patients the risk and discomfort of open abdominal exploration We have had no serious complications, the only minor one being some degree of surgical emphysema of the abdominal wall in a few cases, in no case were the abdominal contents injured, and in Ruddock's extensive experience the accident has happened in only 0 6% of cases, in every one of which it was recognised at the time and dealt with surgically We have never seen a hernia through the puncture in the abdominal wall, and in all series reported to date there has been no case of air-embolism Patients who have had this investigation under a local anæsthetic are able to leave hospital next day

In the upper abdomen we have found peritoneoscopy particularly useful in gastric and liver conditions Of 32 cases of carcinoma of the stomach, examined with a view either to confirming the diagnosis or assessing operability, 9 showed metastases and were considered inoperable, thus being spared laparotomy In 20 no metastases were seen, and laparotomy was undertaken, 11 of these had a subsequent gastrectomy, while 9 were found at operation to be inoperable on account of an extension of the growth not seen through the peritoneoscope In 2, no growth was seen with the peritoneoscope, but operation revealed a carcinoma, 1 patient, in which no metastases were seen, was not operated on because of his poor general condition

A series of 18 patients with either palpable enlarged livers or ascites probably of hepatic origin have been examined, 10 showed malignant nodules, 4 cirrhosis 2 hepatitis and 2 fatty degeneration Of 8 cases of suspected cholecystitis or gall-stones, 6 showed a pathological gall-bladder, confirmed at operation, while in 2 the gall-bladder appeared to be normal but was found at operation to contain a single stone Thus a positive result is of value in dealing with the gall-bladder, but a normal looking gall-bladder may still contain calculi

In 16 cases the ovaries were examined, 8 on account of menstrual irregularities of which 6 showed multiple unruptured graafian follicles and 2 polycystic ovaries, and 8 for ovarian cysts, of which 3 were malignant with peritoneal metastases, while in the other 5 the diagnosis was confirmed and the cyst subsequently removed In a further 2 cases, in which malignant ovarian cysts had previously been removed, metastases were found in 1 case and confirmed by a subsequent autopsy Of 8 cases of carcinoma of the body or cervix of the uterus 3 showed peritoneal metastases, 1 liver metastases, and 4 evidence of broad-ligament invasion only Other conditions which have been diagnosed include ectopic pregnancy metastatic retroperitoneal melanotic sarcoma, tubercular peritonitis, tubercular salpingitis, endometrioma and some cases of splenomegaly In 2 cases diagnosed clinically as tubercular peritonitis no pneumoperitoneum could be established on account of adhesions, this was confirmed by laparotomy in one case

There is no point, in this preliminary report, in giving a complete list of all the cases, since in a number of the early ones the examination was inconclusive, and in others there has been no opportunity to confirm the peritoneoscopic findings But a few illustrative examples may be given

CASE-RECORDS

CASE 1 —A girl of 21, complaining of two attacks of hæmatemesis, had a barium meal and was reported to have appearances suggesting a leather bottle stomach suspicious of carcinoma Peritoneoscopy showed the characteristic appearance of subserous malignant infiltration with metastases, and a total gastrectomy was successfully performed

CASE 2 —A woman of 64, complained of abdominal pain and wasting of 7 months' duration, and her clinical condition suggested that she had a carcinoma of the stomach, a barium meal was inconclusive Peritoneoscopy showed the anterior surface of the stomach to be normal, but scarring and adhesions to the first part of the duodenum suggested duodenal ulcer She made a good recovery on medical treatment, and reported well 3 years later

CASE 3 —A woman was admitted with subacute intestinal obstruction, the site of which could not be determined clinically, under a general anæsthetic the obstruction was localised by means of the peritoneoscope to the lower part of the ileum, and the absence of metastases in the liver noted At operation these findings were verified, and a short-circuit performed, with subsequent removal of the cause of the obstruction, a lymphosarcoma

CASE 4 —A girl of 22 had had a papilliferous ovarian cyst removed 6 months before, she now complained of abdominal pain and nausea, no tumour could be felt clinically Peritoneoscopy showed several metastatic nodules in the peritoneum and intestinal wall

The following two cases illustrate the differential diagnosis of ectopic gestation

CASE 5 —A young woman who had had one previous child She now had had two months amenorrhœa, and complained of having had an acute attack of pain low in the right iliac fossa, followed by a vaginal loss and vomiting The pulse rate and temperature were a little raised and there was tenderness in the right vaginal fornix but no mass was felt Peritoneoscopy showed both fallopian tubes to be normal and a little blood stained fluid in the pouch of Douglas and a recently ruptured graafian follicle in the right ovary She made a rapid and complete recovery with no special treatment

CASE 6 —A young primigravida with irregular menstruation and 10 weeks amenorrhœa, acute pain in the left iliac fossa, followed by a vaginal loss, slight rise in temperature and increase in the pulse rate The left vaginal fornix was tender and contained an indefinite swelling Peritoneoscopy showed a left pyosalpinx and this was confirmed by laparotomy

CONCLUSIONS

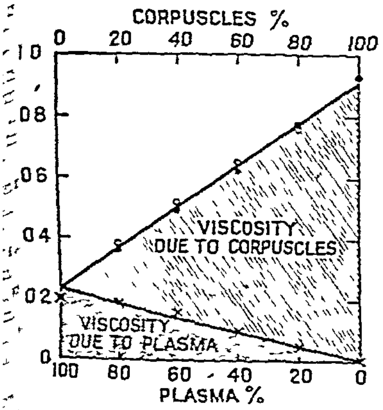
This series is a short one, and only a few [illegible] can be drawn from it The method of investigation is still, particularly in this country, in its early stage With experience and improvements in the instrument and technique a greater proportion of reliable results will be obtained, giving rise to more accurate diagnosis and sparing an increasing number of patients a useless laparotomy In some of our cases the conclusions drawn have been misleading, but as experience grows the number of these is being reduced In cases of ascites the operation is no more severe than paracentesis and gives far more information In malignant [illegible] particularly of the stomach it helps the surgeon to determine the question of operability, in those portance in controlling the viscosity of whole blood , the hæmatocrit rises the blood becomes more viscous addition, changes in plasma viscosity play their part ess (1912) and Trevan (1918) thought that these were e only important factors, apart from temperature owever if salt is added to blood to make the plasma pertonic plasma viscosity does not alter appreciably.

TABLE I.—Viscosity of blood (VB), of plasma (VP), and of rpuscles (VC), hæmatocrit (H), and mean corpuscular volume CV), when NaCl was added to oxalated blood to produce pertonicity

ncentration of idded NaCl (%)	VB	VP	VC	H (%)	MCV (c μ)
0	3 4	2 1	13 3	23	90
0 2	3 6	2 1	14 1	19 8	77
0 4	4	2 1	15 4	18	70
0 6	4	2 1	15 8	16 7	66

t the blood viscosity is increased, although the hæmato- t is reduced by corpuscular shrinkage (table I) ierefore the corpuscles have *a rôle in the production* the internal friction of the blood apart from the rcentage volume they occupy This factor may be oelled corpuscular viscosity

Blood is a mixture of plasma and formed elements niefly red corpuscles) The latter are sometimes oken of as the solid portion of the blood, but in fact cked corpuscles can flow along a hæmatocrit tube nich is laid on its side and can be sucked into a capillary pipette They are formed, but can be deformed, as ev consist of fluid in a thin envelope Deformation curs readily in capillaries where the pressure is slight Krogh 1929) I have found it helpful to visualise blood in relation to its viscosity as a mix*ture of two fluids*, plasma and packed corpuscles



IG 1—Viscosity and blood concentration
log blood viscosity plotted against % corpuscles in plasma corpuscle mixtures
log plasma viscosity plotted against % plasma in plasma saline mixtures
log corpuscle saline viscosity in corpuscle-saline mixtures plus log plasma viscosity in plasma saline mixtures plotted against % corpuscles

Plasma viscosity —Fishberg (1930) showed that the logarithm of the viscosity of mixtures of plasma and water varied as the proportion of plasma in the mixture, although this relationship can be modified by a high urea, cholesterol or bile-salt content of the blood Oberst (1939) applied another formula but the discrepancies between the two equations are slight when the figures are low, as the values of plasma iscosity are and my apparatus was not sufficiently ensitive to determine which is correct

Hæmatocrit —If the corpuscles and plasma in oxalated lood are separated by centrifugation they may be mixed n different proportions and the viscosity of each mixture an be estimated Some relevant results are shown in able II From the curves obtained (fig 1), there seems o be linear relationship between the hæmatocrit (% ccupied by the corpuscles) and the logarithm of the iscosity Furthermore, the logarithm of the blood iscosity is equal to the logarithm of the plasma viscosity ultiplied by the proportion of plasma plus the logaithm of the viscosity of the packed corpuscles multiplied y the proportion of corpuscles or

$$\log \mathrm{VB} = \frac{\log \mathrm{VP}(100 - \mathrm{H}) + \log \mathrm{VC} \times \mathrm{H}}{100}$$

here VB is blood viscosity VP is plasma viscosity, C is corpuscular viscosity and H is hæmatocrit

Other formulæ have been proposed That of Frei (1907–08) and the second equation of Nygaard Wilder and Barkson (1935–36), deny that variations in plasma or corpuscular viscosity affect blood viscosity The formula of Hess (1912) the two equations applied by Trevan (1918) and the first equation of Nygaard, Wilder and Barkson (1935–36) deny that corpuscles have any influence apart from occupying space—i e , altering the hæmatocrit Bayliss (Bazett 1919) suggested that there was a logarithmic relationship between blood viscosity and hæmoglobin per cent

TABLE II—OBSERVED VISCOSITY (OB V) AND CALCULATED VISCOSITY (CAL V) OF CORPUSCLE-PLASMA MIXTURES

Blood	Corpuscles (%)	Ob v	Cal v	Log ob v	Blood	Corpuscles (%)	Ob v	Cal v	Log ob v
A	0	1 54		0 1875	B (*cont*)	60	6 1	6 4	0 7852
	20	2 3	2 2	0 3617		80	10 4	10 4	1 0170
	40	3 1	3 1	0 4914		100	16 4		1 2148
	60	4 2	4 3	0 6232					
	80	5 9	6	0 7709	C	0	1 8		0 2553
	100	8 5*		0 2994		20	2 7	2 6	0 3617
						40	3 4	3 5	0 5315
B	0	1 6		0 2041		60	4 5	5 2	0 6532
	20	2 7	2 5	0 4314		80	7	7 4	0 8451
	40	4 3	4 1	0 6335		100	11 6		1 0645

* Washed corpuscles

Corpuscular viscosity —Since packed blood corpuscles are much thicker than water it is difficult to measure their viscosity accurately with a Hess viscosimeter in which the measuring tubes are equal in size But if VB, VP and H are known, VC can be calculated from the formula given above The corpuscular viscosity was sound to vary within fairly narrow limits but the causes of such variations are not clear In a random group of 18 people no relationship could be found between corpuscular viscosity and mean corpuscular volume, mean corpuscular hæmoglobin or mean corpuscular hæmoglobin concentration In consecutive estimations on two patients however corpuscular viscosity did vary with mean corpuscular volume (table III)

TABLE III —*Corpuscular viscosity (VC), mean corpuscular volume (MCV), mean corpuscular hæmoglobin (MCH), and mean corpuscular hæmoglobin concentration (MCHC), in a patient with intractable bleeding from a duodenal ulcer, who had frequent blood transfusions (case 36), and another patient, suffering from chronic empyema and nephritis, who had a blood-transfusion (case 38)*

Case	Date	VC	MCV (c μ)	MCH (μmg)	MCHC (%)
36	Feb 24	12 7	77	23	30
	24	13 8	80	21	27
	25	13 8	83	25	30
	26	14 5	102	30	29
	27	11 7	81	25	30
38	Feb 21	13 3	89	23	26
	24	12 5	67	18	28

The change in viscosity is probably not caused by the change in the size of the corpuscles for in vitro VC is increased when the corpuscles are diminished in size by hypertonicity of the plasma (table I) Several observations of viscosity were made in each of 23 patients When these revealed a fall in plasma viscosity (and therefore in the protein concentration of the plasma) there was an associated rise in corpuscular viscosity 21 times, and a fall 8 times when plasma viscosity rose there was an associated fall in corpuscular viscosity 12 times and a rise 9 times Changes *in VC occur with* changes in the milieu in which the corpuscles lie but it would be unwise to particularise without more investigation

Stephens (1936) concluded that leucocytes probably did not alter blood viscosity notably unless there were more than 50,000 per c mm

BLOOD VISCOSITY IN HEALTH AND CONVALESCENCE AND IN THE LAST MONTH OF PREGNANCY

Since there are no published figures expressing corpuscular viscosity, measurements were made in 50 people of whom 13 were in good health and 37 fully convalescent

The limitations of this method of survey were impressed on me three weeks later when one of the girls whom I had examined at the factory and declared to be free from tuberculosis was admitted to my ward with a large tuberculous peritoneal effusion There was, however, no evidence of disease of the lungs Her sister, who had joined the factory after I had begun my screening and had not been examined, was then called to the clinic as a contact and was found to have phthisis

SECOND SURVEY

The next factory to which I turned my attention was also new, well-constructed and well-ventilated, and in it were about 800 people, by far the majority young women Dr Neville Crosby, the medical officer to the factory welcomed the idea of screening them all, and after a meeting with the managing director I was allowed to proceed The former guarantees of re-employment after treatment and examination in the firm's time were obtained The factory was already fitted with loudspeakers to every department and when arrangements were ready the works manager made a short speech into the microphone, explaining that it was the wish of the directors that everybody, men and women, executives and hourly workers alike, should be X rayed to be certain that the unnatural sort of life many were now leading was not affecting their health, and asking any who did not agree to be X rayed to give their names to a supervisor

It should be noted that no guarantees were given, no mention of tuberculosis was made, and, most important of all, that the employees were asked to send in their names if they did *not* wish to be examined The same arrangements were made as for the previous factory, and the set was hired from the Victor Company The attendance exceeded our expectations, for of the 820 employees 795 came for examination Of these, 17 were given appointments to attend my clinic for fuller investigation, 2 of them were known established cases of phthisis, and 1 other was found to have active disease and was given sanatorium treatment, 13 were asked to keep under observation, and of these latter 1 was subsequently regarded as having active disease The remaining patient was a middle-aged man with peculiar shadows suggestive of cystic disease

DISCUSSION

The amount of work and organisation necessary to conduct these two small factory surveys was considerable so I was somewhat disappointed with the 60% response in the first factory, the response in the second, however, must be regarded as very satisfactory Perhaps too much propaganda was used and the word tuberculosis was used too often in the first factory The number of cases of tuberculosis discovered, while satisfactory as an indication of the health of the community, was smaller than I had expected But there are other important effects of the surveys which are not immediately apparent The directors, for instance, were stimulated to further interest in the health and welfare of their employees, the employees who were to attend for observation were advised about diet, overtime work and other activities, and so perhaps have been prevented from developing the disease, lastly, the employees have become accustomed to the idea of X-ray examination even though they are apparently fit This point is important, for when this sort of examination ceases to have much emotional meaning for the examinees little difficulty will be experienced in obtaining the cooperation of the great majority of the population at risk

During the late summer two of the girls who were found to be tuberculous in the first survey, having returned from sanatorium, resumed their work in the factory I am told that they are creating a favourable opinion of the radioscopic examinations and I have been asked to return to make a further survey A return visit will be well worth while, particularly as there are some 500 new employees since last year This invitation indicates that the management understand something of the tuberculosis problem, and that the staff will cooperate when they have the opportunity

SUMMARY

X-ray screening of the chest was offered to the workpeople in two factories, the management allowing this to be done in working hours In the first 60% and in the second 97% came for examination Of 575 people examined in the first factory 3 were found to be tuberculous Of 795 examined at the second factory 2 were known to have phthisis and 2 others were found to have active disease

---

BLOOD VISCOSITY

PHILIP EVANS, M SC, M D MANC, M R C P
PHYSICIAN (E M S) AT CUCKFIELD HOSPITAL ASSISTANT PHYSICIAN TO THE CHILDREN'S DEPARTMENT, KING'S COLLEGE HOSPITAL

THE composition of blood may be altered by loss of plasma or blood from the circulation, as in traumatic shock, or reverse changes may be instituted by transfusion of plasma or blood These variations have a topical interest and it seems worth while to consider their effect on blood viscosity, which has been thought to be a factor of some significance in shock (e g Cannon 1918 Moon 1938)

Measurement of blood viscosity —On Boxing Day, 1842, the observations of Poiseuille, and his law governing the flow of water through fine tubes, were enunciated to the Academie des Sciences (Arago et al 1843) Blood seems to obey Poiseuille's law if the pressure driving it is below 100 mm of mercury and the tubes are not finer than 0 3 mm in diameter (Fahraeus and Lindqvist 1931) Blood viscosity may therefore be measured relative to water by comparing the flow of the two fluids through similar tubes Many types of viscosimeter have been used (Arago et al 1843, Hirsch and Beck 1900, Mar 1901, Denning 1906, Determann 1906a, Burton Opitz 1907, McCaskey 1908, Trevan 1918 Fahraeus and Lindqvist 1931, Brundrage 1935) and that of Hess (190 has found favour as an instrument for clinical use Blood and water at 20° C ± 3° C are drawn through exactly similar horizontal capillary tubes into graduated measuring tubes by the suction of a rubber bulb When the blood has travelled from 0 to 1 in one graduated tube the suction is stopped and the amount of water which has flowed into the other graduated tube is noted If it has reached mark 5 the blood is 5 times as viscous as water, the blood viscosity is simply recorded as 5

I could not obtain a Hess viscosimeter, and so made one using thermometer tubing 140 mm in length and 0 6 mm in bore for the capillary tubes, and graduated 1 c cm pipettes as measuring tubes They were joined by a glass Y tube to a rubber aural syringe which produced the suction All the joints were of rubber tubing The whole was mounted on a board, but could be taken to pieces for cleaning The readings are probably not very different from those obtained with the Hess instrument, as I found the mean blood viscosity of healthy and convalescent people to be 4 65 (standard deviation 0 87) while Nygaard, Wilder and Barkson (1935–36) found values of 4 64 (S D 0 86) in 503 healthy people The estimations of plasma viscosity were, however, rather lower than those given by most authors

Venous blood was used, 3 c cm being taken into a syringe which had been washed out with normal saline to avoid hæmolysis, which increases viscosity, as much saline as possible being ejected from the syringe before use

Some investigators (Hess 1907b, Bolognesi 1909, Austrian 1911, Holbrook and Jackson 1939) used fresh blood, but this has obvious drawbacks Burton Opitz (1911) and Birch (1920) used defibrinated blood, but defibrination alters the viscosity Heparin is said to alter the viscosity of plasma (Oberst 1939) Hirudin has been found satisfactory (Determann 1906a and b, Welsh 1911–12, Trevan 1918, Brundrage et al 1936) Oxalate salts (see Langstroth 1919) are cheap and readily available but cause corpuscular shrinkage (Wintrobe 1933) although this can be largely obviated by using 2 mg of a 2 3 mixture of potassium and ammonium oxalate per c cm blood (Heller 1934) The 3 c cm blood was therefore squirted into a 25 c cm screw capped bottle which contained 6 mg of the salt mixture, and shaken thoroughly for some minutes to ensure solution of the oxalate and aeration of the blood Shaking was repeated immediately before the estimation was made, and done again between each group of three estimations if a constant result was not obtained in the first three This is important, as corpuscular sedimentation is rapid in some specimens, and causes errors

Factors governing blood viscosity —The proportional volume of the formed elements, or hæmatocrit, is of

TABLE V—VISCOSITY AND HÆMATOCRIT BEFORE AND AFTER TRANSFUSIONS

Diagnosis	Reason for transfusing	Amount transfused (c cm)	Duration of transfusion (hr)	Plasma viscosity			Blood viscosity			Corpuscular viscosity			Hæmatocrit		
				B	A	Nd	B	A	Nd	B	A	Nd	B	A	Nd
PLASMA TRANSFUSIONS															
ultiple injuries, no bleeding	Shock	540	¼	1 65	1 8		5 3	4 9		12 8	12 8		50	47	
ompound fracture femur	,	540	¼	1 9	1 6		4 9	4 3		13 2	13 5		44	39	
ost-partum hæmorrhage	Collapse	800	1¾	1 75	1 7	1 55	3 3	2 4	2 4	13 2	12 6	13 3	29	20	18
,, ,,	,,	890	½	1 7	1 65		3 5	3 2		13 1	13 5		33	26	
,, ,,	,,	540	1	1 6	1 6		3 7	2 6		13 1	12 3		37	31	
BLOOD-TRANSFUSIONS FOR RECENT HÆMORPHAGE*															
ost partum hæmorrhage	Acute anæmia	450	½	1 65	1 6	1 55	3 2	3	2 9	13 5	13 6	13 8	26	25	4
ompound fracture femur	Bleeding during opn	500	1	1 6	1 6	1 6	4 3	4 5	3 7	13 5	13 5	13 2	39	41	36
ost partum hæmorrhage	Acute anæmia	500	2	1 6	1 6	1 55	3	3 1	3 1	12 8	13 1	13 5	32	29	28
,, ,,	Ac and chron anæmia	540	1¾	1 6	1 7		2 7	2 9		13 2	13 4		23	22	
leeding duodenal ulcer	,, ,,	2000	19	1 4	1 5		2 3	2 7		13 8	13 8		17	21	
,, ,, ,,	,, ,,	1200	16	1 5	1 7		2	2		14 5	11 7		14	15	
ost partum hæmorrhage	Acute anæmia	940†	9½	1 6	1 4		3 1	3		12 7	13 3		34	30	
,, ,,	,, ,,	500†	19	1 4	1 6	1 6	3	3	2 9	13 3	13	13 1	30	29	2
BLOOD TRANSFUSIONS FOR ANÆMIA															
Cæsarean section	Bleeding 2 days before	250	1	2	1 9	1 8	3 6	3 6	3 5	13 8	13 3	13 7	30	29	26
ost-partum hæmorrhage	,, 2 ,, ,	500	2½	1 8	1 9	1 8	3 3	2 8	3 3	13 6	12 5	13 4	24	25	26
,, ,	,, 1 day	540	4	1 7	1 8		2 9	3 9		13 4	13 7		22	30	
,, ,,	2 days ,,	540	4½	1 8	1 8	1 6	3 9	3 9	3 6	13 7	13 7	13 5	30	30	32
Empyema	Chronic anæmia	500	1	1 65	1 6	1 95	3	2 8	3 7	12 7	12 6	13 2	31	31	30
mpyema and nephritis	, ,,	800	2	2 1	1 8	2 1	3 4	3 5	3	13 1	13 9	12 5	23	26	27
ost partum hæmorrhage	Bleeding 2 days before	800	19	1 6	1 8	1 75	2 9	2 9	3	13 1	12 3	12 3	26	33	37
,, ,	,, 5 ,, ,,	800	10	1 9	1 9		2 8	4 1		12 3	13 5		28	33	

* During transfusion or within previous 24 hours † 500 c cm saline also given B = before, A = after, Nd = next day

in burns) the final result might be an increase in sity

BLOOD VISCOSITY AND PARTURITION

parturition there are hæmorrhage and tissue damage might therefore expect that any changes in the sity of the blood would be similar to those occurring other injuries such as surgical operations In fact, gh the changes are variable, an immediate rise in the blood viscosity was noticed, and was followed by a to a level lower than that observed before labour ed The fall would be expected as a result of loss of l, and it was chiefly caused by a reduction in hæmato- (table VII) The immediate rise was caused by an ase in hæmatocrit and in plasma viscosity This r indicates a decrease in the watery constituents of plasma, which is probably not due to a reduction of hydræmia of late pregnancy since the change is soon rsed and the plasma quickly becomes less viscous before A partial explanation may be that some ents do not drink during labour and so become ydrated The change in whole-blood viscosity is lar to that seen after surgical operations by Bolgnesi 9) and Muller (1909) Corpuscular viscosity was lly diminished during labour and increased in the dav or two, thus partly counterbalancing the factors ling to alter the viscosity of whole blood

SUMMARY

he relationship between whole-blood viscosity, and viscosity and quantity of plasma and corpuscles is ressed by the equation log blood viscosity=log plasma viscosity × proportion of plasma + log viscosity of packed corpuscles × proportion of corpuscles

Corpuscular viscosity is increased in vitro by hypertonicity of the plasma The causes of variations in vivo are not clear

The viscosity of oxalated blood, plasma and corpuscles, and the hæmatocrit, were estimated in 50 healthy and convalescent people The values obtained for blood viscosity were similar to those obtained by investigators who used fresh blood, the plasma viscosity was slightly lower There are no comparable figures for corpuscular viscosity, which was found to vary between 12 5 and 14 times that of water

TABLE VI—CHANGES IN PLASMA VISCOSITY BEFORE AND AFTER TRANSFUSION

Viscosity before transfusion	Change after transfusion		
	Fall	No change	Rise
Under 1 6	0	0	3
Exactly 1 6	1	3	2
Over 1 6	7	2	3

In 27 pregnant women near term the plasma and corpuscular viscosities were similar to those of the non-pregnant people, but there was a parallel reduction of the blood viscosity and hæmatocrit

Plasma-transfusion was found to reduce blood viscosity considerably

TABLE VII—BLOOD VISCOSITY AND HÆMATOCRIT BEFORE AND AFTER PARTURITION

e	Labour and complications	Plasma viscosity			Blood viscosity			Corpuscular viscosity			Hæmatocrit		
		Before	Less than 2 hr after	1–3 days after	Before	Less than 2 hr after	1–3 days after	Before	Less than 2 hr after	1–3 days after	Before	Less than 2 hr after	1–3 days after
	Normal	1 75	1 75	1 6	3 5	3 4	4 1	12 7	12 6	13 5	38	39	37
	,,	1 9	1 9	1 55	3 2	3 2	3 8	12 5	12 3	13 8	34	36 2	32 8
	,	1 9	1 9	1 2	4 9	4 3	3 3	12 9	12 7	13 8	49 6	46 3	33 8
	,	1 85	1 8	1 9	3 7	4 3	3 4	13	12 7	13 2	35	48	28
	,	1 65	1 7	1 45	4 2	3 6	3 3	13 8	13	13 4	34 3	35 5	32
	,	1 55	1 6	1 55	3	3 4	4 2	12 8	13 3	13 4	33	32	39
	,,	1 75	1 9	1 7	3 7	5 3	4	12 9	13 4	13 9	37	41 5	31
	,	1 55	2	1 75	4	4	2 8	13 7	12 8	12 4	35	37	29 5
	,,	1 95	1 85	1 65	4 6	4 8	3 8	13 3	13 4	13 5	39	41	33·6
	Premature	1 35	1 8	1 8	3 2	3 9	4	13 1	12 9	13 2	35 5	39 1	37
	Pre-eclampsia	1 35	2	1 85	2 6	4	4	12 5	13 1	13 1	34	37	37 5
	Urinary infection	1 7	2 1	1 7	4 4	4	3 8	13 7	13 3	13 5	36	33 6	32 4
	Forceps episiotomy	1 85	1 9	1 3	4 6	5 3	3 5	13 3	13 7	13 4	41	41 3	38
	Forceps tear	1 9	1 9	1 3	5 4	4 6	4 3	13 1	12 9	12 8	51	47	48
n	—	1 72	1 86	1 62	3 9	4 2	3 7	13 1	13	13 3	37 8	38 8	35

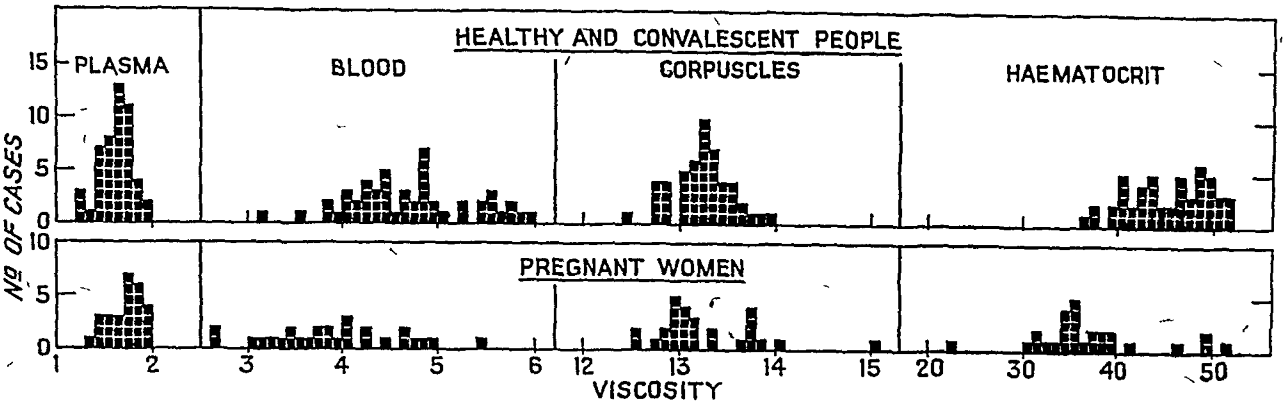


FIG 2—Viscosity of plasma, blood and corpuscles, and hæmatocrit, in 13 healthy and 37 convalescent people, and in 27 pregnant women

from various ailments, mostly trivial In this series 10 were female and 40 male, 7 were in the first decade of life, 12 in the second, 21 in the third, 7 in the fourth, 2 in the fifth, and 1 in the sixth The distribution of the values found may be seen in fig 2 The blood viscosity and hæmatocrit estimations did not differ much from those of Nygaard and others (1935–36) (table IV)

Because some further work was done on the blood changes occurring during labour and post-partum blood-transfusion, observations were also made on 27 women during the last month of their pregnancies (table IV and fig 2) The plasma and corpuscular viscosity in them did not differ materially from the "normal," but there was a parallel reduction of blood viscosity and hæmatocrit in the pregnant women

TABLE IV—MEAN VISCOSITY AND HÆMATOCRIT IN HEALTHY PEOPLE AND PREGNANT WOMEN

Author	Subjects	Type	Plasma viscosity		Blood viscosity		Corpus viscosity		Hæmatocrit	
			Mean	SD	Mean	SD	Mean	SD	Mean	SD
Evans	50	Healthy conv	1 71	0 14	4 65	0 87	13 19	0 65	44 80	5 72
Nygaard et al (1935–36	503	Healthy	1 96*	0 14	4 64	0 86			44 47	7 52
Evans	27	Pregnant	1 7	0 16	3 88	0 66	13 22	0 55	36 44	7 19

* Serum Conv = convalescent

BLOOD VISCOSITY AND TRANSFUSION

It is recognised that plasma-transfusion will reduce blood viscosity more than blood-transfusion, but apparently no measurements of the degree of these changes have been published In table V figures are given for 5 transfusions of plasma and 16 of blood Estimations were made immediately before and immediately after transfusion, and about 24 hours later It was not always possible to get the third reading, as a second transfusion was sometimes given in less than 24 hours, and also because 2 of the patients died

The "plasma" used for transfusion was that removed from stored blood by the Emergency Blood Transfusion Service, and thus consisted of a mixture of plasma and citrate-glucose-saline solution The blood transfused was fresh, and contained 10% of 3 8% sodium citrate solution, except for the second transfusion in case 38, when stored blood was used

The transfused plasma had a viscosity of about 1 6, so that if the patient's plasma viscosity was over 1 6 it might be expected to fall after transfusion, and if under *to rise* The viscosity of the plasma in transfusion blood was not constant, so the expected result occurred often but not always (table VI)

The changes in plasma viscosity need not be further considered, for, in comparison with alterations in hæmatocrit and corpuscular viscosity, they have little effect on variations in whole-blood viscosity

Plasma-transfusion in cases of circulatory collapse was accompanied by a fall in hæmatocrit, and a variable change in corpuscular viscosity Although the transfusions were not large, the blood viscosity was reduced by from 8 to 30%, with a mean of 17% (fig 3)

Blood-transfusion for hæmorrhage (i e, bleeding during transfusion or in the preceding 24 hours, whether chronic anæmia was also present or not) produced variable results, depending not alone on the transfusion but also on the changes produced in the blood as a reaction to hæmorrhage The mean changes in 3 patients from whom complete figures were obtained are shown in fig 3, and suggest that transfusion served to retard temporarily the reduction of blood viscosity which was occurring as the blood volume was being restored by hæmodilution during recovery There was no suggestion that the hearts of such patients were overloaded by a rise in blood viscosity

Blood-transfusion for anæmia was accompanied by a rise in the mean hæmatocrit and fall in corpuscular viscosity, so that there was usually little change in blood viscosity In two patients (cases 30 and 6) there was a considerable rise in blood viscosity, caused by a rise of both corpuscular viscosity and hæmatocrit Both had had transfusions of 540 c cm the day before, but a third transfusion in case 30 was not followed by a rise in blood viscosity In the 24 hours after transfusion there was sometimes a rise in viscosity and sometimes a fall The rise was large only in one patient (case 38) and was due to a rise in corpuscular viscosity These results suggest that a dangerous rise in blood viscosity is not likely after blood-transfusion in anæmic patients This does not, of course, necessarily apply to patients with hæmoconcentration In them blood-transfusion would presumably be followed by a reduction of blood viscosity, but if plasma continued to escape from the capillaries

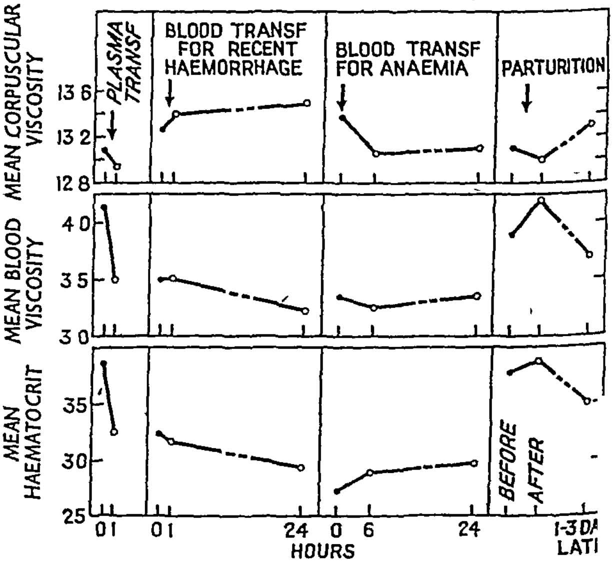


FIG 3—Mean blood and corpuscular viscosity and hæmatocr before, immediately after, and about a day after transfusion an parturition

TABLE V—VISCOSITY AND HÆMATOCRIT BEFORE AND AFTER TRANSFUSIONS

Case	Diagnosis	Reason for transfusing	Amount transfused (c.cm)	Duration of transfusion (hr)	Plasma viscosity			Blood viscosity			Corpuscular viscosity			Hæmatocrit		
					B	A	Nd	B	A	Nd	B	A	Nd	B	A	Nd
PLASMA TRANSFUSIONS																
33	Multiple injuries, no bleeding	Shock	540	¾	1 65	1 8		5 3	4 9		12 8	12 8		50	47	
34	Compound fracture femur	,,	540	¾	1 9	1 6		4 9	4 3		13 2	13 5		44	39	
39	Post-partum hæmorrhage	Collapse	800	1¾	1 75	1 7	1 55	3 3	2 4	2 4	13 2	12 6	13 3	29	20	18
35	,, ,,	,,	890	½	1 7	1 65		3 5	3 2		13 1	13 5		33	26	
13	,, ,,	,,	540	½	1 6	1-6		3 7	2 6		13 1	12 3		37	31	
BLOOD-TRANSFUSIONS FOR RECENT HÆMORRHAGE*																
35	Post partum hæmorrhage	Acute anæmia	450	¾	1 65	1 6	1 55	3 2	3	2 9	13 5	13 6	13 8	26	25	4
34	Compound fracture femur	Bleeding during opn	500	1	1 6	1 6	1 6	4 3	4 5	3 7	13 5	13 5	13 2	39	41	36
13	Post-partum hæmorrhage	Acute anæmia	500	2	1 6	1 6	1 55	3	3 1	3 1	12 8	13 1	13 5	32	29	28
30	,, ,,	Ac. and chron anæmia	540	1¾	1 6	1 7		2 7	2 9		13 2	13-4		23	22	
36	Bleeding duodenal ulcer	,, ,,	2000	19	1 4	1 5		2 3	2 7		13 8	13 8		17	21	
26	,, ,,	,, ,,	1200	16	1 5	1 7		2	2		14 5	11 7		14	15	
12	Post-partum hæmorrhage	Acute anæmia	940†	9½	1 6	1 4		3 1	3		12 7	13 3		34	30	
12	,, ,,	,, ,,	500†	19	1 4	1 6	1 6	3	3	2 9	13 3	13	13 1	30	29	2
BLOOD TRANSFUSIONS FOR ANÆMIA																
2	Cæsarean section	Bleeding 2 days before	250	1	2	1 9	1 8	3 6	3 6	3 5	13 8	13 3	13 7	30	29	26
29	Post-partum hæmorrhage	,, 2	500	2½	1 8	1 9	1 8	3 3	2 8	3 3	13 6	12 5	13 4	24	25	26
30	,, ,,	,, 1 day	540	4	1 7	1 8		2 9	3 9		13 4	13 7		22	30	
30	,, ,,	2 days	540	4½	1 8	1 8	1 6	3 9	3 9	3 6	13 7	13 7	13 5	30	30	32
35	Empyema	Chronic anæmia	500	1	1 65	1 6	1 95	3	2 8	3 7	12 7	12 6	13 2	31	31	30
35	Empyema and nephritis	,, ,,	800	2	2 1	1 8	2 1	3 4	3 5	3	13 1	13 9	12 5	23	26	27
12	Post-partum hæmorrhage	Bleeding 2 days before	800	19	1 6	1 8	1 75	2 9	2 9	3	13 1	12 3	12 3	26	33	37
6	,, ,,	,, 5 ,, ,,	800	10	1 9	1 9		2 8	4 1		12 3	13 5		28	33	

* During transfusion or within previous 24 hours † 500 c.cm saline also given. B = before, A = after, Nd = next day

(e g in burns) the final result might be an increase in viscosity

BLOOD VISCOSITY AND PARTURITION

In parturition there are hæmorrhage and tissue damage One might therefore expect that any changes in the viscosity of the blood would be similar to those occurring after other injuries such as surgical operations In fact, though the changes are variable an immediate rise in the mean blood viscosity was noticed, and was followed by a fall to a level lower than that observed before labour started The fall would be expected as a result of loss of blood, and it was chiefly caused by a reduction in hæmatocrit (table VII) The immediate rise was caused by an increase in hæmatocrit and in plasma viscosity This latter indicates a decrease in the watery constituents of the plasma, which is probably not due to a reduction of the hydræmia of late pregnancy since the change is soon reversed and the plasma quickly becomes less viscous than before A partial explanation may be that some patients do not drink during labour and so become dehydrated The change in whole-blood viscosity is similar to that seen after surgical operations by Bolgnesi (1909) and Muller (1909) Corpuscular viscosity was usually diminished during labour and increased in the next day or two, thus partly counterbalancing the factors tending to alter the viscosity of whole blood

SUMMARY

The relationship between whole-blood viscosity and the viscosity and quantity of plasma and corpuscles is expressed by the equation · log blood viscosity=log plasma viscosity × proportion of plasma + log viscosity of packed corpuscles × proportion of corpuscles

Corpuscular viscosity is increased in vitro by hypertonicity of the plasma The causes of variations in vivo are not clear

The viscosity of oxalated blood plasma and corpuscles, and the hæmatocrit, were estimated in 50 healthy and convalescent people The values obtained for blood viscosity were similar to those obtained by investigators who used fresh blood the plasma viscosity was slightly lower There are no comparable figures for corpuscular viscosity, which was found to vary between 12 5 and 14 times that of water

TABLE VI—CHANGES IN PLASMA VISCOSITY BEFORE AND AFTER TRANSFUSION

Viscosity before transfusion	Change after transfusion		
	Fall	No change	Rise
Under 1 6	0	0	3
Exactly 1 6	1	3	2
Over 1 6	7	2	3

In 27 pregnant women near term the plasma and corpuscular viscosities were similar to those of the non-pregnant people, but there was a parallel reduction of the blood viscosity and hæmatocrit

Plasma-transfusion was found to reduce blood viscosity considerably

TABLE VII—BLOOD VISCOSITY AND HÆMATOCRIT BEFORE AND AFTER PARTURITION

Case	Labour and complications	Plasma viscosity			Blood viscosity			Corpuscular viscosity			Hæmatocrit		
		Before	Less than 2 hr after	1–3 days after	Before	Less than 2 hr after	1–3 days after	Before	Less than 2 hr after	1–3 days after	Before	Less than 2 hr after	1–3 days after
1	Normal	1 75	1 75	1 6	3 5	3 4	4 1	12 7	12 6	13 5	38	39	37
3	,,	1 9	1 9	1 55	3 2	3 2	3 8	12 5	12 3	13 8	34	36 2	32 8
4		1 9	1 9	1 2	4 9	4 3	3 3	12 9	12 7	13 8	49 6	46 3	33 8
15	,	1 85	1 8	1 9	3 7	4 3	3 4	13	12 7	13 2	35	48	28
16		1 65	1 7	1 45	4 2	3 6	3 3	13 8	13	13 4	34 3	35 5	32
17		1 55	1 6	1 55	3	3 4	4 2	12 8	13 3	13 4	33	32	39
19	,	1 75	1 9	1 7	3 7	5 3	4	12 9	13 4	13 9	37	41 5	31
27	,	1 55	2	1 75	4	4	2 8	13 7	12 8	12 4	35	37	29 5
32	,,	1 95	1 85	1 65	4-6	4 8	3 8	13 3	13 4	13 5	39	41	33-6
9	Premature	1 35	1 8	1 8	3 2	3 9	4	13 1	12 9	13 2	35 5	39 1	37
23	Pre-eclampsia	1 35	2	1 85	2 6	4	4	12 5	13 1	13 1	34	37	37 5
5	Urinary infection	1 7	2 1	1 7	4 4	4	3 8	13 7	13 3	13 5	36	33 6	32 4
8	Forceps episiotomy	1 85	1 9	1 3	4 6	5 3	3 5	13 3	13 7	13 4	41	41 3	38
11	Forceps tear	1 9	1 9	1 3	5 4	4 6	4 3	13 1	12 9	12 8	51	47	48
Mean	—	1 72	1 86	1 62	3 9	4 2	3 7	13 1	13	13 3	37 8	38 8	35

Blood-transfusion for hæmorrhage retarded the reduction of blood viscosity to a variable extent.

Blood-transfusion for anæmia did not usually increase blood viscosity much, but the transfusions were not large.

Parturition was followed by an immediate increase in the mean viscosity of plasma and blood, and the mean hæmatocrit. Reverse changes occurred later. The changes in hæmatocrit and in plasma viscosity were to some extent counterbalanced by inverse changes in corpuscular viscosity.

REFERENCES

Arago, Babinet, Piobert, and Regnault (1843) *Ann Chim (Phys)* 7, 50
Austrian C H (1911) *Bull Johns Hopk Hosp* **22**, 9
Bazett, M C (1919) *Spec Rep Ser med Res Comm Lond* **25** 181
Bircher M E (1920) *Pflug Arch ges Physiol* **182**, 1
Bolognesi, G (1909) *Zbl Chir* **36**, 1161
Brundrage, J T (1935) *Amer J Physiol* **110**, 659
— Cataion, A and Griffith, R S (1936) *Amer J med Sci* **192** 30
Burton Opitz, R (1911) *J Amer med Ass* **57**, 353
Cannon, W B (1918) *Ibid*, **70**, 611
Denning A d'P (1906) *Lancet* ii, 89
Determann, H (1906a) *Münch med Wschr* **53**, 905, (1906b) *Z klin Med* **59**, 283 (1910) *Ibid*, **70**, 185
Fahraeus, R and Lindqvist, T (1931) *Amer J Physiol* **96**, 562
Fishberg E H (1930) *J biol Chem* **85**, 465
Frei (1907–08) *Rep Gov vet Bur, Transvaal* quoted by Bircher
Heller, V G (1934) *J Lab clin Med* **19**, 777
Hess W (1907a) *Münch med Wschr* **54**, 1590, (1907b) *Ibid*, p 2225, (1912) *Vjschr gerichtl Med* **44** 93
Hirsch, C and Beck, C (1900) quoted by Determann (1910)
Holbrook, A A and Watson, M V (1939) *Amer J med Sci* **198**, 750
Krogh, A (1929) Anatomy and Physiology of the Capillaries, London
Langstroth, L (1919) *J exp Med* **30**, 597
McCaskey, G W. (1908) *J Amer med Ass* **51**, 1563
Mayer, A (1901) quoted by Determann (1910)
Moon V H (1938) Shock and Related Capillary Phenomena, London
Muller, W (1909) *Zbl Chir* **37** 1401
Nygaard, K K Wilder, M and Barkson, J (1935–36) *Amer J Physiol* **114** 128
Oberst F W (1939) *J clin Invest* **18** 799
Stephens D J (1936) *Proc Soc exp Biol Med N Y* **35** 251
Trevan, J W (1918) *Biochem J Camb* **12**, 60
Welsh, W H (1911–12) *Heart*, **3**, 118
Wintrobe, M M (1933) *Amer J med Sci* **185**, 58

WELL-LEG EXTENSION FOR FRACTURED PELVIS AN IMPROVED SPLINT

W E JOSEPH, M B CAMB
SENIOR MEDICAL OFFICER AT WHIPPS CROSS HOSPITAL

THE splint which is here described has been designed for the treatment of two very important types of fracture of the pelvic girdle (1) fracture of the pelvis resulting in upward displacement of one half of the pelvic girdle, sometimes known as Malgaigne's fracture or the "fore-and-aft-fracture", (2) fracture of the floor of the acetabulum with medial displacement of the head of the femur, sometimes referred to as a central dislocation of the femur. Many patients suffering from such injuries are condemned to suffer from permanent deformity and disability owing to the belief of many surgeons that there is no efficacious means of treatment available. Much too often treatment is concentrated on any coexisting soft-tissue injury and the bony injury is more or less neglected. This should not be so. By the employment of this splint, which makes use of the principle of "well-leg" extension, these fractures can be adequately treated.

This is no new form of extension. At a meeting of the London Medical Society in 1826 Chorley[1] of Leeds advocated a very similar form of treatment for intracapsular fracture of the neck of the femur. Roger Anderson[2] has devised an apparatus utilising this principle for the treatment of intra- and extra-capsular fractures of the neck of the femur. Hoye of Atlanta, and later Broomhead[3] of Leeds, used this method for treating fractures of the pelvis, the latter using a modified Thomas splint incorporated in plaster.

Well-leg extension is a method whereby fixed extension is applied to the injured leg and counter-extension is taken on the sole of the opposite leg. The more commonly known type of fixed extension is that in which the counter-extension is taken on the ischial tuberosity through a well-fitting Thomas splint. In well-leg extension the pull exerted on the injured leg is transmitted through the bars of the splint to the plaster cast, and through this to the sole of the uninjured leg. Therefore since the plaster cast cannot move in relation to the pelvis the injured side of the pelvis must of necessity move distally in proportion to the pull exerted on it.

PRINCIPLES OF TREATMENT

The "fore-and-aft" or Malgaigne's fracture is a complicated and extensive fracture of one half of the pelvis. There is a fracture of the pubic bone, or disruption of the symphysis pubis, together with fracture of the ilium near the sacro-iliac joint or disruption of that joint. The affected half of the pelvis falls away laterally from the midline in much the same way as the valve of a mollusc opens, but in addition it may be displaced upwards. In that case the limb on that side is carried upwards also and a grave deformity is caused. This fracture is caused by force applied in an antero-posterior direction.

Fracture of the floor of the acetabulum may be accompanied by fracture of the pubic bone or ilium or both. The acetabulum is fractured and the head of the femur is forced medially to a greater or less degree, the extreme case being that in which the head of the femur has been driven completely through the floor of the acetabulum into the pelvis. This fracture is usually due to a fall on the feet, especially if there is some abduction of the limb at the moment of impact or to a fall on, or blow in the region of, the great trochanter.

Damage as extensive as in these types of fracture can only be caused by severe violence. The common accidents responsible are (1) falling from a height, (2) being crushed between a wall and a moving vehicle, or by falling masonry, &c, and (3) being run over by a heavy vehicle. Accidents such as these are more common in war-time, not only among fighting forces but also among civilians. Severe damage is done to the bones and joints, and also to the soft parts such as bladder, urethra and muscles of the pelvic girdle. Extensive hæmatomata often result both in the musculature of the pelvis and loin and in the subperitoneal tissues of the pelvis and paracolic gutters, even extending at times between the layers of the mesentery. The associated pain is very severe, even on slight movements, and shock is usually profound. In view of the gravity of the injury it is essential that rest and relief of pain should be obtained—relief not only in the early stages by the use of drugs but during the whole period of immobilisation. It is the surgeon's duty to eliminate as far as possible any pain caused by movement during essential nursing operations, thus improving the morale of the patient and lightening the work of the nursing staff.

The three important aims in treatment are therefore to reduce the deformity, to maintain the reduction until healing takes place, and so to splint the patient that pain is eliminated as far as possible even when the necessary nursing operations are carried out. The nursing of these injuries is often not given sufficient attention. Attention to the patient's comfort during treatment is as important as the treatment itself. Every effort should be made to obtain as perfect a reduction of a fracture as possible, but if in so doing the patient suffers acute discomfort for days and possibly weeks every time the bed is made or a bedpan is used, then the method adopted should be considered faulty and an alternative instituted. Well leg treatment of the fractures mentioned above satisfies these requirements. Adequate traction is available to effect and maintain reduction of the deformity, and fixation in plaster-of-paris is the least painful method of splintage.

THE SPLINT AND ITS APPLICATION

In essence the splint used (fig 1) is a Thomas splint with modifications. The ring is absent but pieces of sheet iron are riveted to the upper ends of the side bars at right angles to the bars. These are to allow a purchase to be obtained on the plaster. At the foot end of the splint is a spindle carrying a ratchet at one side and a knob for turning at the other. To this spindle is attached a length of Bowden wire. A Pearson knee attachment is added to allow flexion of the knee in order that the stirrup h not press on the anterior border of the tibia A spring balance is necessary so that constant and accurate measurement can be made of the degree of tension being applied

---

[1] *Lancet*, 1826, **12**, 89
[2] Anderson, R *Surg Gynec Obstet* 1932, **54**, 207
[3] Broomhead, R *Proc R Soc Med* 1933, **27**, 576

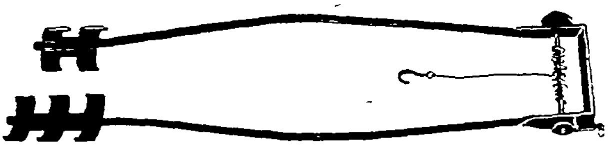


FIG 1—Splint for well leg traction

Under general anæsthesia a double hip plaster spica is applied (fig 2) On the sound side this extends down to and includes the foot The plaster is padded usually with Gamgee tissue, since allowance has to be made for movement of the affected limb and pelvis inside the plaster The special splint is applied with the shorter bar on the inner side of the thigh and the longitudinal bars projecting in the same long axis as the thigh It is essential that the plaster be not carried too high on the inner side of the thigh, since this is one of the places at which pressure occurs The other important pressure area is the foot of the well-leg, especially its lateral border The foot must be carefully padded and bandaged, with no bumps or wrinkles in the wool, and the foot must be in a neutral position Skeletal traction is obtained by a Kirschner wire passed through the lower end of the femur As soon as the plaster has set traction can be begun, about 15 lb being applied at first, gradually increased to 30-35 lb as required X-ray pictures are taken frequently to control the progress of reduction and when this is deemed satisfactory traction is eased off until there is just sufficient to maintain the reduction usually 10–15 lb Windows may be cut in the plaster to allow early institution of faradism of the quadriceps, or in the event of a ruptured urethra to allow room for the necessary suprapubic drainage

CASE-RECORDS

The following two cases illustrate the application of the method to the two types of fracture described above

CASE 1—A van boy, aged 16 Run over by a lorry Shocked Extensive bruising about left hip and loin In great pain when moved No injury of the genito urinary system Radiogram (fig 3*a*) shows a fracture of the left pubic bone with disruption of the left sacro iliac synchondrosis Slight upward displacement and some lateral opening of this half of the pelvis Pelvic brim is badly deformed, the oblique diameter being greatly reduced

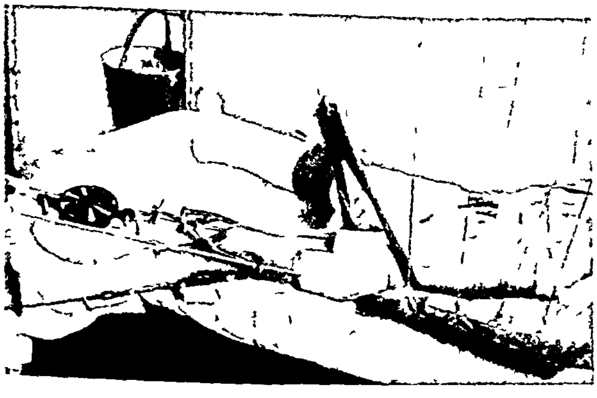
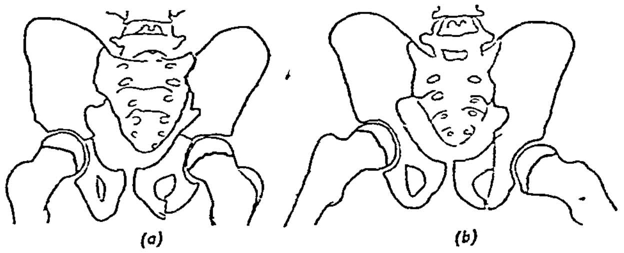


FIG 2—Double hip spica with well leg traction applied

Well leg counter traction using a force of 30 lb for 4 days produced reduction of the deformity (fig 3*b*) The force was then reduced to 10 lb for about a fortnight and then discontinued, and the wire was removed from the femur Two months from the date of accident the plaster was removed and a month later he got up and was discharged to the out-patient department He was finally discharged 4 months from the time of the accident He then had full painless movements in all joints and was considered fit for full work

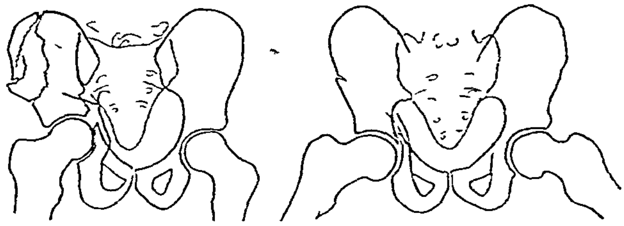
CASE 2—A slater and tiler, aged 42 Fell 25 feet off a roof, landing on his right side In great pain Some shock Unable fully to extend right hip Radiogram (fig 4*a*) shows comminuted fracture of right acetabulum and ilium Head of the femur is driven into the pelvis and the oblique and transverse diameters are reduced

The day after the accident well leg counter traction was applied with a pull of 35 lb In 36 hours deformity had been reduced (fig 4*b*) Traction was then reduced to 10 lb, and a radiogram taken a month later showed no recurrence of the deformity Faradism to the quadriceps of the right thigh was begun 2 days after the splint was applied and continued throughout the period of immobilisation All splintage was removed in 2 months and after a further month in bed he was allowed up on crutches, which were gradually discarded Within 8 months he was back at full work as slater and tiler



(*a*) (*b*)

FIG 3—Tracings of radiograms in fore and aft fracture of pelvis (*a*) Before treatment, (*b*) after reduction by well leg traction applied for 4 days



(*a*) (*b*)

FIG 4—Tracings of radiograms in fracture of acetabulum and ilium (*a*) Before treatment, (*b*) after reduction by well leg traction applied for 36 hours

SUMMARY

An improved splint has been designed for applying the principle of well-leg extension in the treatment of two serious types of fracture of the pelvic girdle (*a*) fracture involving one half of the pelvis with a resulting upward displacement of that half, (*b*) fracture of the floor of the acetabulum with a medial displacement of the head of the femur

The well-leg method of extension, although by no means new is not sufficiently well known

The incidence of these two types of fracture is higher in time of war They are usually the result of severe violence such as crushing or falling from a height Extensive damage to soft tissues particularly the bladder, is a common accompaniment but if attention is mainly directed to these injuries and the bony injury is neglected pain and shock will be caused by movement of fractured surfaces during nursing manipulations, and healing may leave severe deformity

Nursing of these patients is particularly difficult unless adequate splintage of the fractures is provided The method here described satisfies all requirements

Two illustrative cases one of each type of fracture, are recorded

The splint may be obtained from Allen and Hanburys

The headquarters of the FAMILY PLANNING ASSOCIATION has remained at Bournemouth (190 Old Christchurch Road) but the London office in Eccleston Square remains open and the work goes on In their eleventh annual report for 1941 they point out that the war has increased the need for women to plan their families most of the voluntary clinics are still open, many report an increase in the number of their patients Information about the clinics has been sent to industrial welfare superintendents, and the provision of medical advice for married women in the Forces is being considered The medical subcommittee is conducting a clinical investigation into the comparative efficacy of certain chemical contraceptives

TWO CASES OF CHRONIC MENINGOCOCCAL INFECTION

A S WATTS, M B , B SC LOND
LATE HOUSE-PHYSICIAN AT THE WESTMINSTER HOSPITAL

IN his Hunterian lectures on cerebrospinal fever in 1919, Sir Humphry Rolleston[1] divided the cases of intermittent fever due to meningococcal septicæmia into four groups (1) lasting for weeks without any meningitic symptoms, (2) terminating in meningitis, (3) following meningitis, and (4) showing transient meningitis The following two cases illustrate some of the difficulties encountered in the diagnosis of this type of infection, and approximate to Rolleston's second group

CASE 1 —A girl clerk, aged 15½, admitted to the Bolingbroke Hospital on July 7, 1941 Six weeks before she had developed a sore throat and coryza She had a temperature and was in bed for three days and then returned to work, though she did not feel her normal self A week later she had complained of headache, slight pains and stiffness in the muscles of her neck and had vomited, and a slight rash had appeared on her arms, lasting a few days On admission she had a flushed face and looked ill Temperature 103° F, pulse rate 124, respirations 24 There was no rash The tongue and fauces were dry The discs showed early bilateral papillœdema Tendon reflexes were absent but the plantar responses were flexor There was stiffness of the neck muscles, and Kernig's sign was positive No splenic enlargement The cerebrospinal fluid was purulent protein 0 4%, globulin in excess, 9352 polymorphs and 1273 lymphocytes per c mm, gram positive organisms in film, none on culture She was treated with sulphapyridine, 6 g being given by mouth on the first day This made her vomit copiously, so that next day 5 g was given intravenously, followed by 4 g in rectal saline Finally 4 g was given daily by mouth until a total dose of 25 g had been given The temperature and pulse rate fell to normal in four days, and all symptoms rapidly cleared up On July 14 the C S F was clear protein 0 44%, globulin in excess, 69 polymorphs and 97 lymphocytes per c mm, no organisms in film or culture On account of the slowness with which the cells in the C S F returned to normal she was given a second course of sulphapyridine—1 g t d s for three days The duration of illness was 12 weeks No blood cultures were done Lumbar puncture on Sept 1 produced a clear fluid protein 0 04%, globulin normal, 6 lymphocytes per c mm

CASE 2 —A wood machinist, aged 50, admitted to Westminster Hospital on June 8, 1941 He had been taken ill a month before with a sore throat, headache, pains in his legs, vomiting and fever, and had been diagnosed as influenza He was away from work two weeks, spending the first week in bed He returned to work but felt limp A week later his symptoms returned, and in addition he developed stiffness of the neck and photophobia He then remained in bed at home for a week On admission he looked ill Temperature 103° F, pulse rate 110, respirations 25 He had mild photophobia There was no rash The tongue and fauces were glazed Pupils reacted briskly to light and accommodation, no papillœdema There was well marked neck rigidity and head retraction, and a positive Kernig's sign All reflexes were present except the abdominals, the plantar response was flexor No splenic enlargement Cerebrospinal fluid opalescent, pressure 180 mm of water, protein 0 125%, globulin in excess, 104 polymorphs and 27 lymphocytes per c mm, no organisms seen in film, one colony of meningococcus group I grown on culture He was given sulphapyridine by mouth, 9, 6, 6, and 6 g daily The temperature and pulse rate settled within four days and all symptoms cleared up in eight days On June 17 the C S F was clear pressure 95 mm of water, protein 0 075%, globulin in excess, 38 lymphocytes per c mm, no organisms in film or on culture On the 28th it was again clear, pressure 100 mm of water, protein 0 025%, globulin normal, 3 lymphocytes per c mm No blood culture was done Throat swab grew *Staphylococcus aureus* only Duration of illness eight weeks

The wife of this patient had been admitted on May 4, 1941, and treated successfully for a mild form of acute meningitis, probably meningococcal, though organisms could not be found in the C S F by direct smear and culture, or in the blood after culture for 17 days A daughter aged 13½ was found by culture of a postnasal swab to be a carrier of group I meningococcus

Both cases 1 and 2 were regarded as infections of the upper respiratory tract They cleared up without specific treatment sufficiently to allow a return to work, and meningitic signs did not develop until another week had elapsed This suggests that mild cases of meningococcæmia may easily escape detection, being regarded as cases of influenza and treated as such until eventually meningitic signs appear The infection produces a fairly severe systemic reaction in these cases, and the meninges are only slightly affected Both the systemic and meningitic signs clear up very rapidly with sulphapyridine The meningococcus is difficult to cultivate even in acute cases In these mild and chronic forms it seems that a diagnosis has sometimes to be made on clinical findings alone and in the face of a negative culture of blood and C S F

Chronic septicæmia appears to be a mild form of meningococcal infection, and like other mild forms may be more common at the end of a seasonal epidemic

I wish to thank Dr W E Lloyd of Westminster Hospital for permission to publish these cases, and Dr J G Humble and Dr E N Gauld for their help

---

[1] *Lancet*, 1919, i, 535

INCIDENCE OF CLINICAL ACNE IN MEN

E LIPMAN COHEN, M B CAMB
PHYSICIAN TO THE WESTERN SKIN HOSPITAL, LONDON,
CAPTAIN, R A M C

THERE have been a number of extensive reviews of the incidence of acne vulgaris at puberty and in adolescence but apparently none in adults Thus Bloch's paper (1931) is concerned with ages 6–19, Hinricksen and Ivy (1938) 5–22, and Lynch (1939) 17–21 All these regard the presence of comedones as indicative of acne but MacLeod and Muende (1940) say, "The comedo is physiological rather than pathological," and Roxburgh (1939) writes, "The number of comedos required to constitute clinical acne depends on circumstances" I have included only such acne as is noticeable on looking at a man when stripped and have not searched for blackheads in any case This corresponds approximately to Hinricksen and Ivy's third group acne in "the narrowest sense"

The men were soldiers, and 391 were examined, 59 had obvious acne vulgaris—i e, 15% The ages of the last 207 were recorded, and the incidence in the different age-groups is shown in the table None of the 4 men outside these age-groups had acne

Ages (yr inclusive)	No of men	No men with acne and %
20–24	102	19 (19)
25–29	50	14 (28)
30–39	51	8 (16)

The number of men examined is too small to enable dogmatic statements to be made Roxburgh (1939) states that acne ceases between the ages of 20 and 30, Sequeira (1927) describes it as "rarely lasting beyond the twenty-fifth year", and according to Walker and Percival (1939) "after thirty it is rare" It seems that most authorities have put the upper age-limit too low and that acne is relatively common in men over 30

REFERENCES

Bloch B (1931) *Brit J Derm* 43, 61
Hinricksen, J and Ivy, A C (1938) *Arch Derm Syph, Chicago*, 37, 975
Lynch, F W (1939) *J Amer med Ass* 113 1792
Macleod J M H and Muende, I (1940) Practical Handbook of the Pathology of the Skin, London p 236
Roxburgh, A C (1939) Common Skin Diseases, London p 350
Sequeira, J H (1937) Diseases of the Skin, London p 232
Walker, N and Percival, G H (1939) An Introduction to Dermatology, Edinburgh p 217

MESSRS BOOTS have issued a preparation 'Azozol,' consisting of a 5% solution of hexazole, which is equivalent to Triazol 156, or 'Azoman,' and intended to be used in the same way in the convulsion treatment of mental disease

EFFECT OF ELECTROTHERAPY ON DENERVATED MUSCLES IN RABBITS *

ERNEST GUTMANN
M D PRAGUE

LUDWIG GUTTMANN
M D FREIBURG

(*Department of Zoology and Comparative Anatomy and Nuffield Department of Surgery in the University of Oxford*)

A HUNDRED years ago John Reid in Edinburgh published a paper on the relation between muscular contractility and the nervous system in which he described for the first time the beneficial effect of a galvanic current on denervated muscles Since then opinions about the value of electrotherapy in the treatment of peripheral nerve lesions have oscillated considerably Its importance was at first overrated, but later there was some scepticism and criticism and even complete repudiation of its value Even the great clinical experience of the last war has not settled this problem and no satisfactory conclusions can be reached from the experiments on the subject (Friedlaender 1896, Langley and Kato 1915, Langley 1916, Hartmann and Blatz 1920, Fischer 1939, Chor et al 1939, Solandt and Magladery 1940)

We therefore decided to study this question again in the rabbit We have restricted ourselves to the study of the effect of the galvanic current on denervated muscles and have given particular attention to atrophy of the denervated muscles, electrical excitability and contractility of the denervated muscles, and time and quality of recovery of function of the re-innervated muscles

METHODS

The muscles used were the group supplied by the peroneal nerve in 6 rabbits In 4 of these the peroneal nerve on both sides was completely interrupted by crushing with fine forceps approximately 80 mm from entry into the peroneus longus muscle In 2 others the peroneal nerve was cut at the same level and the stumps joined with plasma by the method of Young and Medawar (1940) The effect of the operation was in all cases a complete motor and sensory paralysis in the distribution of the peroneal

In all cases systematic exercise by galvanic current was then carried out on the paralysed muscles of the left leg while the paralysed muscles of the right leg remained untreated Electrical exercise was carried out daily for 15–20 min at a current strength of 4–6 mA by means of a dry battery apparatus of 120 volts This current intensity is sufficient to elicit strong contractions in the individual muscles without apparently giving rise to pain During the 20 min of treatment about 500–600 single contractions of the muscles were elicited by means of a cathode in the form of a moist pad 3 mm in diameter applied to the distal part of the muscle The anode of a diameter of 8 mm was applied at the upper insertion points of the paralysed muscles at the level of crista tibiæ The current was thus directed longitudinally through the muscles Onset and duration of the electrical treatment applied in the individual cases is shown in the table

Rabbit	Galvanic treatment after op (days)		Time of functional recovery after op (days)		Circumference of leg at end of treatment (mm)		Direct faradic excitability of anterior tibial muscle: via skin at end of treatment (Coil distance (cm))		Direct faradic excitability of anterior tibial muscle: exposed at biopsy (Coil distance (cm))		Weight of anterior tibial muscle (g)	
	st	dur	tr	untr	tr	untr	tr	untr	tr	untr	tr	untr
PERONEAL NERVE CRUSHED												
A	1	125	48	48	90	88	12 6	10 8	27	21	3 72	3 41
B	7	46	39	40	76	74	10 6	8 2	40	23	2 40	1 65
C	20	34	41	41	79	75	8 5	7 5			1 35	0 95
D	20	34	41	43	81	78			38	30	1 94	1 32
PERONEAL NERVE CUT												
E	7	87	74	79	96	91	9 8	7 7	31	23	3 16	1 92
F	28	35	53	56	84	78	9 5	7 8	34	22	2 45	1 44

st = start, dur = duration tr = treated

The following measurements were made on both sides of the operated animals during the treatment weekly measurements of the circumference of the leg 15 mm below crista tibiæ, fortnightly measurements of the direct excitability of the muscles by faradism applied through the skin, time and quality of functional recovery At the end of treatment a biopsy was done under 'Nembutal' anæsthesia, after exposing the muscles on either side The following observations were made on both sides macroscopical appearance of the muscles, direct and indirect excitability of tibialis anterior, extensor digitorum and peroneus longus, weight of the extirpated individual muscles, histological examination of the muscles

RESULTS

During the first two weeks after operation electrotherapy did not prevent atrophy (fig 1) During the subsequent weeks, however, circumference decreased more slowly on the treated side in all animals This effect started within 10–14 days after the onset of treatment In no case did the atrophy of the treated side reach such an extreme degree as that of the untreated side Moreover, in all cases the exercise accelerated the recovery from atrophy once the muscles had become re-innervated, and the circumference of the leg on the treated side reached its normal measurement more quickly than on the untreated side (fig 1) This was particularly noticeable in those cases in which the peroneal nerve was cut and sutured

During the time of treatment individual muscles were stimulated through the skin under light ether anæsthesia by means of a faradic coil and a fine bipolar copper electrode While in men the direct excitability of denervated muscles to faradic stimulation via the skin is generally abolished soon after denervation in the rabbit the direct excitability of denervated muscles is maintained for a long period Both treated and untreated muscles, however, showed an increasingly sluggish reaction and higher threshold of excitability, particularly in the later stages of denervation But the diminution in direct excitability was undoubtedly less on the treated side and the threshold, expressed in terms of coil distance, was lower than that on the untreated side (see table) Furthermore, the muscles of the treated side showed a greater power and rapidity of contraction than those of the untreated side

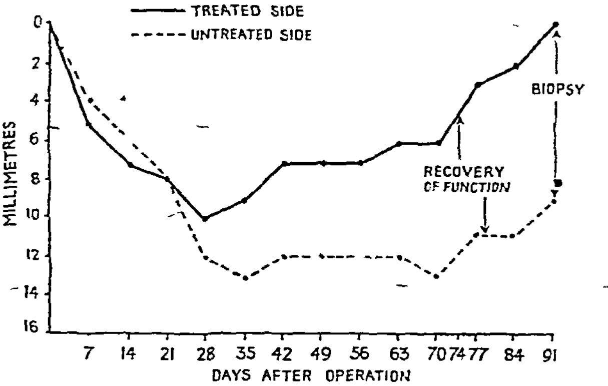


FIG 1—Difference in circumference of the legs measured by cotton thread, of rabbit E in which the peroneal nerve was cut and sutured with plasma 74 mm above the muscle

Recovery of function was recognised by the toe-spreading reflex, the muscles involved in this reflex being innervated by the peroneal nerve There was either no difference in the time of recovery or only a slight difference in favour of the treated side In all cases, however, the spreading was more powerful on the treated side, again particularly in those cases in which the nerve was cut and joined

At various intervals after recovery of function a biopsy was made In all cases there was a striking difference in the appearance of the exposed muscles, the muscles on the treated side were undoubtedly larger than those of the untreated one, and seen by the naked eye hardly differed from normal muscles (fig 2) In all cases there was a definitely lower threshold of direct faradic excitability of the exposed muscles on the treated side Even in rabbit A, which was examined 2½ months after recovery of function, the muscles still showed a lower threshold on the treated side though in this case the difference was less pronounced (see table) The contractions of the treated side were brisker and more powerful especially in those cases in which the peroneal nerve had been cut On testing the indirect excitability no decisive difference could be found between the two sides

---

* With a grant from the Nuffield Committee for the Advancement of Medicine

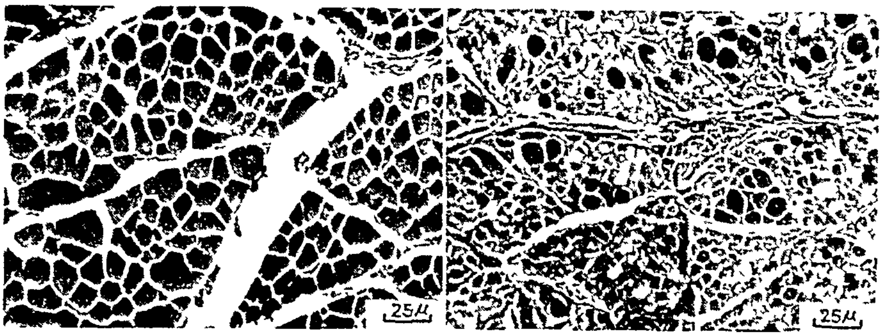


FIG 3—Cross sections of treated and untreated muscles of rabbit E (fixed in formol saline, Masson stain)

At the end of biopsy the tibialis anterior, extensor digitorum and peroneus longus muscles were excised at the insertion points and weighed Care was taken to remove the muscles in the same way on both sides There was in all cases a considerable difference in favour of the treated side, especially in the tibialis anterior (see table) The muscles were fixed in formalin, embedded in paraffin and stained by either the Masson or the Mallory trichrome technique Both transverse and longitudinal sections were made Sections from the treated and untreated side of the same muscle were mounted on the same slide and thus stained identically, in order that the histological picture should be strictly comparable The sections showed that the muscle-fibres on the treated side were of greater diameter and with more apparent cross striation The treated muscles showed a thinner outer connective-tissue sheath and there was much less connective tissue between the individual muscle-fibres than in the untreated muscles (fig 3)

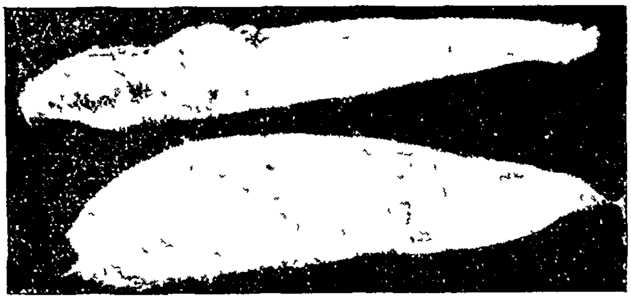


FIG 2—Tibialis anterior muscles of the treated and untreated legs of rabbit E

DISCUSSION

On these results, there cannot be any doubt that the galvanic exercise treatment described had a beneficial effect on the denervated muscles In no case did the atrophy of the muscles on the treated side reach such a high degree as on the untreated side Although the treatment was not able entirely to prevent the onset and progress of atrophy immediately after denervation it definitely delayed and diminished the atrophy in later stages; and accelerated the return of the volume of the muscle to its preoperative size The histological findings eliminate the suspicion that the greater volume of the treated muscle might be the effect of a hypertrophy of the connective tissue exactly the reverse is found—the treated muscles show far less fibrosis

The difference in volume of muscle in favour of the treated side was particularly obvious in the tibialis anterior This muscle gives the greatest field of action for the current on account of its superficial position, and it was therefore the most exercised muscle; this supports the opinion that the galvanic exercise treatment is the more successful the more the individual muscles are exercised The better quality of muscle action on the treated side after recovery of function was also obvious in the more powerful spreading of the toes, particularly in those cases in which the nerve was cut Thus the treatment was sufficient to protect the denervated muscle to some extent from the loss of those factors which are essential for its normal and powerful action when it becomes re-innervated—namely, good "trophic" condition, low threshold of excitability and prompt contractility The treatment therefore undoubtedly leaves the muscle in a more favourable state for recovery The difference between the treated and untreated muscle could still be shown two months after the return of the reflexes

SUMMARY

Galvanic exercise of denervated muscles of the rabbit was found to delay and diminish muscle atrophy and to accelerate the return of muscle to its initial volume after re-innervation

Treated muscles showed less fibrosis, and larger muscle-fibres with more definite striation than untreated muscles

Treated muscles showed a better excitability and contractility on direct stimulation and stronger reflex action than untreated muscles

The more superficial the position of a muscle the more did it show the effect of treatment

We wish to thank Mr J Z Young for his advice and help in revision of this paper, and the Nuffield Committee for the Advancement of Medicine and the Rockefeller Foundation for their aid

REFERENCES

Chor H Cleveland D, Davenport H A, Dolcart, R E and Beard, G (1939) *J Amer med Ass* **113**, 1029
Fischer, L (1939) *Amer J Physiol* **127** 605
Friedlaender A (1896) *Dtsch med Wschr* **1**, 414
Hartmann F A and Blatz W E (1920) *J Physiol* **53**, 290
Langley, J N (1916) *Ibid*, **50** 335
— and Kato T (1915) *Ibid*, **49**, 432
Reid J (1841) *J med Sci* **1** 320
Solandt D Y and Magladery, J W (1940) *Brain* **63**, 255
Young, J Z and Medawar, P M (1940) *Lancet*, ii, 126

Medical Societies

ROYAL SOCIETY OF MEDICINE

AT a meeting of the section for the Study of Diseases in Children on Jan 23, with Dr A G MAITLAND-JONES, the president, in the chair, a discussion on

Intracranial Injuries in Childhood

was opened by Mr D W C NORTHFIELD He reviewed 43 cases of head injury in children aged from three months to fourteen years, 16 being air-raid casualties The brain injury was closed in 35 cases and in these there had been a high proportion of vault fractures 15 having been verified by X rays Consciousness had been lost in 13 of the 35 and abnormal signs had been elicited in 11 In only 4 was the brain injury clinically severe and none had died, though 2 had developed epilepsy The classical adult symptoms of major cerebral contusion had been present in 16 cases In addition there had been 8 compound fractures of the skull, of which 3 were severe, one had died of streptococcal septicæmia and another of intracranial hæmorrhage, 6 had been air-raid casualties Children on the whole seemed to tolerate head injury remarkably well and to recover quickly—perhaps because of the elasticity of their skulls Hæmatoma of the scalp was frequent in children and in a day or two its edges became indurated so that it simulated a depressed fracture, needing X rays for diagnosis A fissured fracture closed had been shown in 8 cases of cephalhæmatoma In 26 cases there had been acute brain injury as indicated by unconsciousness neurological signs or symptoms of abnormal mental activity Transient unconsciousness might be impossible to establish by evidence but traumatic amnesia for the incident might be accepted as an indication that it had occurred The neurological signs seen in 9 cases all disappeared quickly The commonest appearances were in order unconsciousness with signs signs with symptoms and symptoms only The symptoms of major cerebral contusion had been present in only 2 of the cases of compound fracture Abnormal signs were commoner and more likely to be permanent than in the closed cases Of 15 cases of closed injury followed up all were now normal except for 4 cases of occasional headache and 3 of nocturnal restlessness A baby of nine months tumbled from the back seat of the floor of a car when the brakes were applied and had no immediate signs, but showed epileptic symptoms for some hours later on , after five years on phenobarbitone she still had occasional twitching but was otherwise normal Early traumatic epilepsy seemed of better prognosis than that which appeared some two years after an injury. Scalp wounds must never be regarded as unimportant a fracture must always be suspected and surgical treatment applied The frequency of fracture and cephalhæmatoma characterised head injuries in children Concussion was not a grave injury in a child The elasticity and fragility of the child's skull both tended to block the passage of acceleration through the cranium Restlessness might indicate some persistent mental stress not otherwise obvious

Dr W G **Wyllie** said that the differences between the young and the mature in head injuries both in immediate and remote reactions were illustrated by a study of cases of the closed type, or open type with minor injuries only The damage was produced by a violent movement of the head against a solid substance which was different from the impact of a solid object on a stationary head In childhood the injury was nearly always the 'moving-head type and the three outstanding characteristics were the rarity of scalp wounds, the high incidence of fissured fracture and the frequency of concussion The sutural flexibility of the child s skull might suggest that a higher degree of distortion would be required to produce a bursting or fissured fracture but in fact the opposite was the case because of the greater thinness and fragility of the child's skull Infants with fissure fractures often showed no symptoms Until recently concussion had been ascribed either to jarring of neurones or to momentary deformity of the skull and sudden anæmia due to collapse of cerebral vessels The work of Denny-Brown and Ritchie Russell yielded no evidence of raised pressure and suggested that concussion was a traumatic paralysis of neural function in the absence of lesions There was a steady gain of momentum in the moving head and sudden cessation as it struck the hard object The far side had greater momentum and moved further hence the greater frequency of contrecoup injury The stationary-head injury far less often showed concussion A long state of stupor followed by intellectual impairment might arise by the same mechanism which produced momentary concussion with classical symptoms Sometimes autopsy revealed small petechial hæmorrhages in the brain stem and these might stimulate or if more severe paralyse the cerebral circulation Clinically it was often very difficult to distinguish between subarachnoid hæmorrhage contusion or grazing of the cortex subdural and extradural hæmorrhage and cerebral œdema Subarachnoid hæmorrhage within half an hour or so, produced intense headache, unconsciousness and pyrexia from the aseptic meningitis The cerebrospinal fluid was intimately and profusely red Grazing caused a monoplegia, or palsy of an arm and the face, or an arm and leg Jacksonian epilepsy might appear but not perhaps for two or three days The fluid might be slightly stained, but was not much help Extradural hæmorrhage showed hemiplegia in one or two days, with Jacksonian epilepsy and the fluid might be normal or yellowish with raised protein Subdural hæmatoma meant an encapsulated collection of blood accumulating very slowly It occurred at the extremes of life and was rare in the head injuries of children It appeared as an infantile pachymeningitis hæmorrhagica with no known injury Cerebral œdema was insufficiently recognised as a common result of head injuries It occurred locally round injuries and at the poles in concussion often about the fourth day after concussion and a lucid interval causing irritability dilated pupils and stupor and a swelling which never covered half the cranium The fluid was normal The danger of a fracture was that it might be compound into the ear or nose and meningitis might appear with great rapidity Pupillary changes did not necessarily indicate hemisphere or ventricle lesions, but were usually due to changes in the brain stem Concussion might cause a violent movement of fluid through the aqueduct of Sylvius or pressure of the quadrigeminal plate against the tentorium cerebelli and small hæmorrhages in these regions accounted for most pupillary changes Low fluid pressure readings were commoner than high ones in head injury and normal readings were usual There was no evidence that raised intracranial pressure caused death in head injury Therefore lumbar puncture was not a useful procedure The sequelæ of head injury included cortical defects at the summit of convolutions and demyelination in the underlying white matter, and these might be present without any symptoms or signs noticeable to the family Diabetes insipidus and obesity with bulimia had followed fissured fracture reaching to the base Children escaped headache and mental disturbance far more than adults and seldom showed any loss of initiative This was probably related to the relative lack of elaboration of their mental processes Nevertheless a child occasionally did badly after a head injury

Mr G H **Macnab** thought that fragmented bone at the base of an adult fracture might cause laceration and hæmorrhage but that an injury to the elastic skull of a child might safely be watched for three or four weeks He had never seen epilepsy develop later In a series of cases of concussion in children he had found signs of irritability much more common in fissured fractures Persistent vomiting was taken as a sign of cerebral disturbance in closed injury of adults but might be well-marked in children who made excellent recoveries A baby aged five months which had been blown out of its mother s arms during the blitz had shown an enormous hæmatoma and as this subsided a fissured fracture in the parietal bone It now had a wide deficiency in the bone and a cephalhæmatocele but had had very few symptoms at the time Possibly it had an underlying hydrocephalus for which the cephalhæmatocele was compensatory or possibly an area of bone had been isolated and absorbed with the hæmatoma

Mr J E A **O Connell** said that all his 102 cases of closed injuries had been concussed but naturally a child without a scalp wound would never be brought to hospital unless it showed loss of consciousness Pupillary changes were one of the best localising guides to intracranial hæmorrhage on the side of the bleeding the pupil dilated Dilatation of the lateral ventricle pushing a fracture apart was common in children, though the reason was not clear The result was a ventricular cyst not a meningeal collection of fluid

The **Chairman** suggested that a conservative attitude should be taken to depressed fractures in infants he had always left them alone and had never seen any ill effects He asked also what type of injury ought to be sent to a special neurosurgical head centre

Dr A G **Signy** doubted whether the skull of a child over three years was really more elastic than that of a young adult He thought the injuries would be very different if classed as over or under the age of five years He had performed autopsy on a number of older children who had died almost at once after a closed head injury

---

Royal Society of Medicine —The section of therapeutics and pharmacology of this society will meet on Tuesday Feb 10 at 2 30 P M when Dr Harold Scarborough and Dr R G Macfarlane will open a discussion on vitamins and hæmorrhagic states There will be a discussion on war injuries in relation to neurosurgery and ophthalmology on Friday, Feb 13, at 3 30 P M at a joint meeting of the sections of neurology and ophthalmology The clinical section will meet on the same day at 2 15 P M at King s College Hospital

Reviews of Books

British Medicine

R McNAIR WILSON, M B Glasg London Collins Pp 49 3s 6d

It is hard to put a finger on any scientific discovery and say "this is British," or "this is French" Neptune, after long suspicion, swam into the view of Adams and Leverrier almost at the same moment And who shall now decide between Lamarck and Darwin? The most we can do is to trace the trend of national development, and point out those discoveries in whose inception British influence was predominant When the result has to be compressed into fifty pages and dished up in a form palatable to the lay mind, the task might seem hopeless Dr McNair Wilson has tackled it skilfully, and gives us a list of names of which Britain may be proud Though dealing necessarily with persons rather than with movements, he assigns to us an individual rôle in the drama of science Britain's place has been the bedside rather than the laboratory, and the part she has played has resulted from observation of the patient rather than from abstract reasoning Thus Jenner by observation founded the science of immunology, and Lister, inspired by the laboratory work of Pasteur, evolved the principles of antiseptic surgery The tradition has been followed through Ross and Banting to the present day, when the sulphanilamides, first used in Germany, are being developed through the practical sagacity of Englishmen All the illustrations are interesting, and some of them are good reproductions

Sulphanilamide and Related Compounds in General Practice

WESLEY W SPINK, M D, associate professor of medicine University of Minnesota Chicago The Year Book Publishers, London H K Lewis Pp 256 16s 6d

THE rapid increase in knowledge about the sulphonamides makes it difficult to present in book form any satisfactory survey of the subject, because it may easily be old-fashioned by the time of publication, but most practitioners will welcome Professor Spink's up-to-date book which must have been rushed through the presses at a rate to cause envy in publishing houses in England today He sets out conveniently details about the sulphonamides as currently used in the United States, British readers will note the absence of reference to several useful compounds with which they are familiar

Good horse-sense tempers the recommendations for the clinical use of the drugs Professor Spink insists on the need for bacteriological diagnosis if the most appropriate treatment is to be applied; and he points out how important it is to adjust dosage by the blood-concentration level, particularly in severe infections Referring to the work of Banks on the use of sulphathiazole in meningococcal meningitis, he suggests that the action of drugs in this disease may not be directly related to their concentration in the cerebrospinal fluid—an anomaly which might be explained if meningitis ultimately turns out to be an incident in generalised meningococcal infection The account given of acute staphylococcal disease is perhaps a little optimistic judged by the experience of others, he makes the common error of not assessing the severity of septicæmic cases by quantitative blood-culture In a book primarily intended for general practitioners the chapter on the toxic manifestations of sulphonamides is most valuable, and the references given in it are, as elsewhere, first class The indications for sulphaguanidine and sulphadiazine are briefly surveyed They are interesting drugs, but Professor Spink does not recommend their general adoption to the exclusion of compounds which are on the whole more active

Accidental Injuries

(2nd ed) HENRY KESSLER, M D, F A C S London Henry Kimpton Pp 803 45s

Dr Kessler is most widely known for his work on the rehabilitation of the crippled This book, a record of his experience as medical adviser to the New Jersey Workmen's Compensation Bureau, includes a study of the laws of workmen's compensation in various states of North America, and compares and contrasts them with those of other states throughout the world In this country absolute deafness is considered to be as incapacitating as total blindness, and it is noteworthy that in five of the United States a higher degree of compensation is given for the loss of sight of one eye than for the loss of hearing in both ears In order to receive compensation, the English workman has only to establish aggravation acceleration or precipitation by the injury of the disease causing incapacity, and his disability is then treated as entirely due to his injury In some of the United States, however, it is necessary for the referee to determine what portion of incapacity was inevitable from the disease and what portion was due to the acceleration or aggravation by the injury As Dr Kessler says, "to the question of the extent of aggravation the only answer is a guess" Later in the book he discusses causes and mechanics of injury with their resulting disabilities and attempts to evaluate the end-result of each injury as a percentage disability This will not materially help the examiner in Great Britain to assess capacity for earning, as Dr Kessler fully realises He quotes Anderson's figures in evidence of the versatility of handicapped men

There are a few small omissions, the loss of balance after amputation of the great toe is not mentioned, though this injury may constitute a far greater percentage disability than any of those listed Hallux rigidus, one of the commonest causes of partial incapacity after fractures of the long bones of the lower limbs, is also left out Moreover, many cases of fracture of the patella and the olecranon are now being treated by excision of bone fragments, and Dr Kessler's opinion on resulting disability in such cases would be valuable The chapter on rehabilitation does not give any comprehensive survey of his great work in the restoration of the cripple to industry, but it whets the reader's appetite for more

Essentials of Endocrinology

ARTHUR GROLLMAN, M D, associate professor of pharmacology and experimental therapeutics, Johns Hopkins University London J B Lippincott Company Pp 480 36s

THE general practitioner has long awaited a satisfactory textbook of endocrinology, but two difficulties always stand in the way of gratifying him knowledge in this field advances so rapidly that any textbook is out of date before it is finished, let alone published, and the scope of the subject is so wide that no one man can tackle it with uniform skill In this book Professor Grollman has encountered both hindrances The pituitary, that labyrinthine problem, has betrayed him into various errors of omission In future editions he may find there is more to say about the functions of the pars intermedia in man, and will doubtless make some mention of the work of O'Donovan and Collip on the metabolism hormone, of Gersh on the rôle of the pituitary in the metabolism of water, of the estimation of the 17-ketosteroids in the differential diagnosis of Cushing's syndrome, and of the beneficial effects of pregnancy in Simmonds's disease The possible influence of the thyrotropic factor in the production of Graves's disease is also dismissed without adequate discussion, but after all, it is only fifty years since a professor of anatomy at Cambridge shrugged away the whole pituitary Other glands come off better at Professor Grollman's hands, though much of the modern work on diabetes and carbohydrate and fat metabolism is omitted, and the use of male hormones in chronic mastitis is not mentioned Sins of commission are rarer, but few would share his hopelessness about infantilism or accept unqualified his statement that the adrenal cortex does not normally exert any androgenic activity, and it should be noted that œstrogenic treatment of chronic mastitis is a thing of the past A reference to promising "preliminary" reports on the action of desoxycorticosterone reminds us how great is the lag between journals and textbooks But the work is pleasantly sceptical, avoids those flights of fancy which mar many books on endocrinology, and is easy to read The chapters on the parathyroids and sex determination are outstandingly good and throughout the author holds a just balance between evidence derived from experimental biology and clinical observation

THE LANCET

LONDON SATURDAY, FEBRUARY 7, 1942

SYNTHETIC CREAM

In the summer and autumn of last year there were several large outbreaks of paratyphoid fever, notably in the urban areas of Birmingham,[1] Liverpool[2] and Bristol[3] In most of these synthetic cream was the proved or suspected vehicle of spread, and as a result this new ersatz luxury in our diet came, and still is, under considerable suspicion Synthetic cream as now made by reputable firms—mostly in the London area—is a mixture of flour, dried egg-yolk, sugar and water with a vegetable fat, usually ground-nut oil The flour and water paste is heated to 210° F for 30 minutes and then cooled, the egg-yolk powder and sugar are added the fat is melted separately, held at 145° F and atomised under high pressure into the starchy paste The whole mixture is further heated at 160–170° F for 30 minutes, homogenised, and then cooled to 40° F over brine coolers It is finally piped mechanically into new but unsterilised tins, the lids of which are pressed on by hand and tightened by a mechanical expanding tool Obviously there is no guarantee that the synthetic cream may not become contaminated at the manufacturing plant but the pasteurisation of the mixture and the largely mechanical handling reduces this risk very considerably Further the widespread epidemics naturally brought suspicion on the manufacturers, who as a result have taken additional precautions which usually include a regular bacteriological test of their products Their premises must also conform with the requirements of the new Food and Drugs Act, but as an additional precaution it might be advisable to license all makers of this now popular product

There is a risk of contamination en route from manufacturer to retailer or bakery, but the most likely locus of infection is the bakery, often a large establishment supplying bread and confectionery to many retail shops in the area Here the risk of cream becoming infected by human handlers is much greater than at the factory, and here in fact the epidemiologist has mostly fixed the blame for the recent outbreaks WARIN[1] in his report of three outbreaks in the Birmingham area concluded that the infection always originated in one or other bakery and not at the manufacturer s no other reasonable explanation fitted the epidemiological data, for cream from the same factories was being distributed to many other areas which remained free of paratyphoid Bakehouses have not always established a good reputation for maintaining the high standard of general and personal hygiene which the handling of contaminable foodstuffs demands and cream whether natural or synthetic has been incriminated as the vehicle in many outbreaks of intestinal infections large and small The chance of foodstuffs becoming contaminated by human carriers of an intestinal pathogen is greatest if the disease is of a kind which includes among its victims a proportion of mild infections and transient carriers who continue at work while excreting the organism Paratyphoid is now, probably more than some years ago such an infection—for example in the recent epidemics the fatality ranged from 0 8% at Bristol and just over 1% in Liverpool to 3 5% in one of the Birmingham outbreaks For the discovery of the carrier or ambulant case the Widal test is not now regarded as wholly reliable for transient carriers may not show any specific antibodies in the blood However, it may still be a useful preliminary examination in tracking infected persons among a large staff of workers In a Birmingham outbreak, of a staff of 91 whose bloods were tested 13 gave positive Widal tests and 6 of these were found to be excreting paratyphoid bacilli, in Liverpool 10 excretors were found among 53 persons with positive Widal tests (out of some 200 examined at a bakery) The important point is that only 3 of these 23 excretors were clinically ill In the Bristol outbreak the source of infection was ascribed to a girl who did not develop a clinical attack of paratyphoid until 3–4 weeks after she had infected the cream Thus, when paratyphoid is endemic in an area, and conditions are suitable for epidemic spread, any large establishment may have its quota of transient carriers and ambulant cases, if that establishment is concerned in the distribution of foodstuffs the chance of its being a focus of spread becomes considerable

Prevention must be largely directed to raising the standard of personal hygiene among the personnel of any business concerned in the handling of food particularly cooked or prepared foods and milk The new Food and Drugs Act which came into force in 1939 requires the installation of washhand basins towels and soap in all such premises The MOH through his sanitary inspector, in amicable cooperation with the managerial staff, must educate the handlers of foodstuffs in the attendant dangers and their mode of prevention He will find much practical advice on this subject in the review written by the late W M SCOTT,[4] than whom no-one was better qualified to give it

THE INTERNAL CARTILAGE

THE internal semilunar cartilage is always a common offender, but particularly so in war-time when knees are exposed to unaccustomed strains, and the busy surgeon may save his time by pausing to question his diagnostic criteria and assess the rationale of his treatment CRAVENER and MACELROY[5] surveying some 1700 cases, emphasise that the prognosis is really determined by whether the injury involves the vascular periphery of the cartilage or the avascular central portion If the tear is in the former situation as it is in 55% of cases, healing by fibrous tissue will follow strict immobilisation in the remaining 45% it will lead to non-union with persistence of symptoms In their series 43% of the injuries were in the region of the anterior horn and anterior cruciate ligament and 41% were simple or complex bucket-handle tears, while the posterior horn was affected in only 7 5%, some degree of dislocation occurred in 24 5% of the total and mainly of the anterior end Clinically the most important diagnostic symptoms were found to be pain instability and intermittent swelling locking was reported in less than a third of the cases and could not be regarded as an essential part of the picture

---

[1] Warin J F *Med Offr* Jan 17 1942 p 21
[2] Holt H D Vaughan A C T and Wright H D *Lancet*, Jan 31 1942 p 13
[3] Davies I G Cooper K E and Fleming D S *Ibid* p 129
[4] Scott W M *Ibid* 1941 ii 389
[5] Cravener E K, MacElroy D G *J Amer med Ass* 1941 117 169

Pain on forced rotation, local tenderness and limitation of movement were the most valuable physical signs, and a displaced portion of cartilage was palpable in only 2% of the series The average age was 29, and 86% of the patients were male, with a preponderance of rather sedentary overweight people There is some evidence that the femoral obliquity associated with a wide pelvis is a predisposing factor The average bicristal index—the percentage ratio of bicristal diameter to body-length—was 158, compared with 154 in normal subjects, and though the incidence in women is not as high as might be expected if pelvic width is of significance, an investigation of women exposed to unusual strain in physical-training schools revealed symptoms of cartilage trouble in up to 50% Conservative treatment by plaster fixation in slight flexion for six weeks was used at first in all cases. After this patients were discharged without restriction and two subsequent attacks were taken as indication for operation Just over half of the cases recovered with conservative treatment only, and of the remainder operated on about a quarter were left with persistent symptoms Operative failure was ascribed to misdiagnosis, incomplete removal, damage to articular cartilage or internal lateral ligament, or to regeneration of the semilunar cartilage The optimum time for operation was taken as between six weeks and six months after injury, and the average recovery period was 35 days KORSTLER[6] has confirmed experimentally that healing of the cartilage depends on the blood-supply at the point of injury, and has also demonstrated that interference with the vessels running to the periphery of the cartilage by ligation, operative exposure and even hypermobility may lead to permanent degeneration and damage of the whole structure ROSTOCK[7] also relies on initial immobilisation in all cases, and considers that operative failure is often due to regeneration, his figure of 20% of failures corresponds closely with that of CRAVENER and MACELROY, and with the 25% reported by VANDENDORP and his colleagues[8]

The frequent difficulty in diagnosis has given rise to much ingenuity in developing radiographic methods of investigation RUBIN[9] has shown that the semilunar and articular cartilages can be delineated by forced abduction of the joint, because of the exudation of gas from the synovial fluid as the intra-articular tension is reduced, and this may be sufficient to outline a displaced or torn cartilage, though it does not occur in the presence of an effusion of more than 5 c cm This phenomenon, originally described by DITTMAR,[10] can be reproduced in most synovial joints, but is only of value diagnostically when positive LINDBLOM[11] considers that arthrography with diodone is justifiable, and if this seems an elaborate technique for a homely lesion it only reflects the general feeling that hit-or-miss arthrotomy for vague knee-joint symptoms should become a thing of the past Certainly there is a strong case for conservatism in treating the first attack, and the Army's protection of the soldier's knee from the attention of other than orthopædic surgeons is not unreasonable when the proportion of operative failures is borne in mind

STIGMA

“HE's not mental, doctor, it's his nerves’ Most of us have heard this plea, which sets up metaphysical problems that are best let alone, the terminology gives us enough to think about The wisdom of our forefathers tells us that names can influence man's behaviour but cannot alter things *Give a dog a bad name and hang him* but *a rose by any other name would smell as sweet* Yet we act as if there were a verbal magic that can strip things of their qualities by altering their names, and the more we fail the more we try *For a necessary item of domestic architecture* jakes was a good enough name in Tudor times, privy, elegant and well-connected, came into favour and disfavour nearer our own day, water-closet followed, now comes lavatory, and we are ready to speak of the lavatory seat without giving a thought to our defiance of etymology, even though we have the choice of toilet (ladies or gents') Both these will go, for we shall continue our attempt to deny the undefined but blameworthy quality of man or thing, that persists in attaching itself to what are originally the nicest of words This attempt harms no one individually, any more than does the displacement of napkin by serviette, or the surgeon's discarding of belly for abdomen already favoured by the more polite physician, the layman having forestalled both by extending the stomach boundaries from ensiform to pubes

The anxious relative's “mental” marks however, a stage in another verbal evolution involving an obloquy that falls severely upon a few We are all guilty of a lack of niceness, what with our bellies and our need for privies, but only some of us are mad Now ‘madness’ is a word, direct and simple, that can give dignity and pathos to our language *His madness is poor Hamlet's enemy* would lose by any substitution But “madhouse” inevitably carried with it bad associations in earlier days, changed outlook and methods seemed to call for change of name, so the madhouse became the lunatic asylum, and no name could be more fitting than asylum—a refuge for old or young, mad or sane Yet with such a change persists a stigma, resting ultimately on the patient or the illness, and symbolised by the name of the home that shelters him Years ago the village of Colney Hatch lay just north of London, and nearby was set up an asylum that chanced to become well known, by name at least, to the Londoner, and as an expression of the stigma “Colney Hatch” grew into his idiom and became familiar in his mouth as household words Then suburbia began to stretch northwards, but no one would willingly “go to Colney Hatch So the village and the asylum were both re-christened and Colney Hatch as a place-name disappeared It faded too from Cockney idiom, but the less specific “lunatic asylum’ remained in service till in the next stage of verbal evolution it became the mental hospital” The stigma kept up the chase, once more debasing our language so that now one of us might ask “Was Hamlet mental?” and be understood and unrebuked The Bethlem people must have been stout fellows when they stood by their name in spite of the corruption into Bedlam, they now have their reward in the readiness of patients' relatives to send them to Bethlem Royal Hospital rather than to any institution with mental in its title

---

[6] Koestler J *Arch klin Chir* 1940, 199, 49, *Surg Gynec Obstet* November, 1940, suppl
[7] Rostöck, P *Ibid*, 1940, 200, 456
[8] Vandendorp, Bastien, Vandecasteele, *Rev Orthoped* 1940, 26, 629
[9] Rubin, E L *Brit J Radiol* 1939 12, 649
[10] Dittmar, O *Röntgenpraxis*, 1932, 4 442
[11] Lindblom, K *Acta radiol*, *Stockh* 1940, 21, 274

The antithetical 'nerves" has kept its virtue for generations Its congener "neurosis" has had many ups and downs and now may be used with whatsoever meaning the user likes "Neurotic," however, has grown its own particular stigma Indeed, the choice of idiomatic subtleties is so great that for purposes of tact we might usefully conjugate an imaginary verb, present indicative, thus

I am highly strung	We are nervy
Thou art nervous	You are neurasthenic
He has a neurosis	They are neurotic

But none of us or our real friends must be "mental" at any cost

CONTROL OF YELLOW FEVER

BEFORE the summer of 1940, the Office Internationale d'Hygiène Publique, in Paris, was responsible for coordinating the control of yellow fever along traffic routes Nowadays traffic is doing unusual things and the Office Internationale is out of action An interdepartmental committee has therefore been set up under the chairmanship of the medical adviser to the Secretary of State for the Colonies to plan measures for yellow-fever control The Fighting Services, the Foreign Office, the India, Dominions and Colonial Offices, the governments of South Africa and Southern Rhodesia, and the Ministry of Health are represented on it Seven principal lines of attack have been accepted early detection, correct diagnosis, notification and isolation of cases, inoculation of all travellers in or passing through endemic areas, effective quarantine, with screened accommodation for the non-immunised, destruction of insects in aircraft passing through endemic areas, control of vectors, particularly near aerodromes, special measures of control at aerodromes, and research

Endemic areas are those in which yellow fever exists in a form clinically and biologically recognisable Thanks to examination of the liver by viscerotomy in fatal cases and to the mouse-protection test[1] it is nowadays possible to diagnose endemic yellow fever in supposedly silent areas Wherever the presence of the disease is established, the committee recommend that samples of blood for a mouse-protection test should be taken at an early stage from every person suffering from an undiagnosed fever, and stored at low temperature until it can be sent to a laboratory When a patient dies within 10 days of the onset of such an illness a specimen of liver should be taken for examination Viscerotome specimens should be examined by pathologists experienced in the histology of yellow fever, and if the diagnosis needs confirmation specimens from East Africa should be sent to the Yellow Fever Research Laboratory at Entebbe, Uganda, and those from West Africa to the Medical Research Institute at Yaba, Nigeria People likely to travel by air through the zone between 14° N and the southern boundaries of the Belgian Congo and Tanganyika, and all non-Africans living in or visiting that zone, should be immunised against yellow fever For residents, inoculation should be repeated every two years, and inoculation should be compulsory for those taking up new appointments The governments of British East and West Africa and of the Anglo-Egyptian Sudan are advised to take powers to enforce compulsory inoculation in any area or of any group of people they think necessary The regular staff of all aerodromes should be inoculated and so should casual labourers to the fullest extent possible Inoculation is not fully protective until the tenth day, so that there are difficulties about applying it to casual labourers but the committee feel that the recommendation may help to keep down the numbers of casual workers employed until group inoculation of the populations round aerodromes can be carried out Stocks of vaccine must be often examined to make sure that their immunising properties are active The quarantine period is accepted as 6 days People arriving from endemic areas, if not immune, should be quarantined in properly screened quarters for 6 days Those who have been inoculated more than 9 days and less than 2 years before entering the endemic area, or have recovered from an attack of yellow fever, can be allowed to go on their way Those who are inoculated while in an endemic area and leave it within 9 days of the date of inoculation must be quarantined for 6 days after leaving the endemic area If they leave the area between the 9th and the 15th day after inoculation they must be quarantined for the balance of the 15 days, this is necessary because the 9th day is the last on which the inoculated person can take the infection, and a further 6 days cover the incubation period of the disease There is no scientific evidence that the yellow-fever vaccine now in use causes transmissible virus to circulate in the blood-stream and regulations restricting movements of inoculated people based on the belief that it does should be revised Certificates of non-exposure to infection should no longer be accepted, since they are difficult to verify Insecticides should be used in aircraft before they leave endemic areas, after the passengers have embarked, and again when the aircraft have reached their destination and before passengers have disembarked A hand sprayer connected to a supply of compressed air is recommended instead of the ordinary 'Flit' gun Mosquito control, especially of *Aedes ægypti*, in the neighbourhood of aerodromes and ports must be intensified Mosquitoes are apt to breed on dhows, which should therefore be inspected Piped water-supplies to towns, ports and aerodromes would help to eliminate breeding places Special measures for the protection of aerodromes should include the appointment of an inspecting officer guards and their dependents should not be housed on the aerodrome if it can be avoided but where it is necessary they should all be inoculated, no casual labourers should be housed on the aerodrome The committee recognise the valuable work on yellow fever which has already been carried out by the Rockefeller Foundation in Africa and by the Wellcome Bureau of Scientific Research There is need for further study of vectors and of possible reservoir hosts, and the committee advise that research should be coordinated through the Entebbe laboratory

This comprehensive plan should protect the world against the spread of a dangerous disease it only remains to implement it The committee's recommendations are being sent to all those responsible for taking action

---

[1] *Lancet*, 1941, i, 451

Annotations

BLOOD VISCOSITY

ONE of the factors in the peripheral resistance to flow against which the heart has to work is the viscosity of the blood In mammals the blood is normally about 5 times as viscous as water and the figure for human blood of 4 65 reported by Dr Evans (p 162) agrees with previous results Any increase in blood viscosity is naturally harmful when it increases the work thrown on a heart with reserves of strength seriously diminished by disease, Rogen[1] found that in cases of heart-failure with peripheral congestion, but without œdema the viscosity of the blood was increased and this was an important factor in maintaining the congestive state Blood viscosity below normal is usually associated with dilution of the blood and sometimes with œdema, as a rule it is not an advantage but sometimes, as in circulatory collapse, it may be useful As blood is a compound fluid its viscosity depends on the individual viscosities of the plasma and the red cells and the ratio of plasma to red cells, it is obvious that anæmic blood with its low proportion of red cells, estimated by the hæmatocrit, will be less viscous than normal, anything that leads to dilution of the plasma, such as saline infusion, or the low plasma-protein content of glomerulonephritis, would be expected to lower the blood viscosity Evans points out that the viscosity of the corpuscles may also vary independently though within fairly narrow limits

The effects of blood or plasma transfusion on the viscosity of the blood are naturally of practical importance Will transfusion of whole blood into an anæmic person with a damaged heart cause a sufficient increase in viscosity, and therefore in peripheral resistance, to embarrass the heart ? Evans's results show that on the whole there is no significant increase in blood viscosity after whole-blood transfusions of as much as 2 litres, he attributes this unexpected result to a fall in corpuscular viscosity Plasma transfusions, as was predicted, cause a diminution of blood viscosity—a welcome effect in patients with circulatory collapse, or in those whose blood has become concentrated by loss of fluid from severe burns Evans has as yet no firm explanation for changes in viscosity during and after parturition

This work must not be considered in isolation blood viscosity is but one factor among the many that affect and are affected by changes in the balance of fluid between blood and tissues—changes which are reflected clinically in the state of the circulation

EARLY DIAGNOSIS OF PERTUSSIS

WHOOPING COUGH is one of the most difficult infections to diagnose early Initial pyrexia or upset may be absent, and the catarrhal symptoms may be minimal Coryza followed by infrequent bouts of coughing, more troublesome at night and often ending in retching or vomiting, will make both parent and doctor suspect the disease, but suspicion is not enough Diagnosis at this stage is particularly important for the patient, who should be put to bed in an airy room and possibly given 4–5 successive daily doses of pertussis vaccine which may alleviate the infection if given early, and also for his family or school contacts, to whom the patient is most infectious in the first weeks of the disease A definite diagnosis of pertussis can be made at this catarrhal stage by the cough-plate and Bordet culture medium, but laboratories and clinics where cough plate diagnosis is available are still limited in this country, and the method is not readily adaptable to general practice Perhaps in time a more selective medium—as by the addition of penicillin to the Bordet medium—used in conjunction with the laryngeal or postnasal swab will make the early bacteriological diagnosis of pertussis as practicable as that of diphtheria The need is great, for whooping cough is among the most crippling infections of childhood Meanwhile insufficient attention is given, even in hospital, to the blood-changes as an early diagnostic aid Cruickshank[1] has suggested as the criterion of a diagnostic blood-picture a total white-cell count of 10,000 more than the average for the age, with a relative lymphocytosis of 60–80%, and this blood-picture is usually present in the paroxysmal stage of the disease Less is known about the blood changes in the catarrhal stage Donald[2] examined the blood of 16 cases in the second week of infection, and found leucocytosis with relative and absolute lymphocytosis in 14, the other 2 had leucopenia He used Still's figures as his normal standard for the different ages[3], on this standard the claim of Gorfinkel[4] that a relative lymphocytosis of 55% in a stained film is diagnostic in the catarrhal stage cannot be altogether substantiated, for at six months the normal proportion of lymphocytes is 57% and at two years 53% In actual fact, Gorfinkel's 10 cases, examined in the catarrhal stage, were all aged two years or over and in all but one there was a significant relative lymphocytosis The staining of a blood-film and a differential white cell count is troublesome in general practice, but the practitioner can take or send a film to a public-health or other laboratory for a report The fact that pertussis is now generally notifiable should be an added incentive to the doctor to diagnose the infection both early and accurately, and he will thus reduce the risk of exposure to infection of the younger and most susceptible members of the family

THIOCYANATES AND HYPERTENSION

IN recent years the response of hypertensive cases to thiocyanates has been studied The pharmacological properties of these compounds were first investigated by Claude Bernard although it was not until the turn of the century that the work of Pauli[5] led to their use in attempts to lower high blood-pressures Their toxic properties rapidly made them unpopular for this purpose until Barker[6] in 1936 introduced a method of controlling their administration by regular estimations of their concentration in the blood Since then the potassium and sodium salts have been widely used in the United States, but considerable divergence of opinion has developed about their value Three recent reports from different clinics would seem to summarise the present consensus of opinion on the subject Barker and his colleagues,[7] as a result of their observations on 246 patients find that satisfactory results were obtained in 47 5%, but that for this purpose blood thiocyanate concentrations of 8–12 mg per 100 c cm are essential, improvement usually being obtained in 2–4 weeks Kurtz and his colleagues[8] have treated 50 patients and obtained a "satisfactory" fall in blood-pressure in 78%, the average fall being from 197 to 156 mm Hg systolic and from 115 to 94 mm Hg diastolic They insist that for this line of therapy to be safe adequate laboratory control is essential Freeman[9] in a much smaller series of 20 cases obtained a significant lowering of the pressure in 15, he too stresses the need for careful constant observation All the same, it is not really certain that the thiocyanates are harmless Even Barker, who is one of their keenest supporters, admits their toxicity[10], and a drug which almost invariably produces fatigue,

---

[1] Rogen, A S *Lancet*, 1910, i, 780

---

[1] Cruickshank R *Lancet* 1938 ii, 33

[2] Donald A B *Brit med J* 1939, ii, 613

[3] See Still, G F Common Disorders and Diseases of Childhood, London, 1937 p 699

[4] Gorfinkel M *Sth Afr med J* 1941, 15 451

[5] Pauli, W *Munch med Wschr* 1903 50, 153

[6] Barker, M H *J Amer med Ass* 1936 106 762

[7] Barker, Lindberg, H A and Wald, M H *Ibid*, 1941, 117, 1591

[8] Kurtz C M, Shapiro, H H and Mills, C S *Amer J med Sci* 1941 202, 378

[9] Freeman, I *Bull Md Sch Med* 1941, 26, 109

[10] Wald Lindberg and Barker, *J Amer med Ass* 1939, 112, 1120

weakness and skin eruptions and has been known to evoke nausea and vomiting and psychosis, and even occasionally collapse and exfoliative dermatitis is not likely to commend itself to British clinicians who prefer to feel comfortable about the drugs they use, and if possible to know that their patients are feeling comfortable too. Moreover, individual response to the drug is uneven, the optimum concentration in the blood being produced by very variable dosage, and there seems to be no means of detecting the susceptible individual except by repeated estimations of the blood thiocyanate.

INFANTILE DIARRHŒA AND VOMITING

IN the closing years of last century the death-rate from infantile diarrhœa in England and Wales was about 0.7 per 1000 of the population. Before the present war it had dropped to about a tenth (0.08 in 1937, for example). For this amazing fall various factors are given credit, ranging from the advent of the motor-car, which led to the disappearance of manure-laden streets in cities, to the spread of education in mothercraft by the welfare clinic movement and the vastly increased use of dried milk. But acute gastro enteritis still remains a menace to infant life and health, especially during the first twelve months of life and there is much that is still mysterious about this malady. In his Bradshaw lecture last year J. C. Spence[1] pleaded for a better organised study of the infantile infections, and G. L. Ormiston's[2] work for the Medical Research Council on epidemic neonatal diarrhœa was a good example of the "field survey" which is needed. Now R. M. Campbell and A. A. Cunningham[3] have reported on 574 infants with gastro enteritis admitted to the Park Hospital, in south east London, between January 1937, and August, 1939. They use the term "alimentary-infectious complex" (or AIC) for their cases, for the series studied was a mixed one, being those infants with diarrhœa which remained after the exclusion of specific gastro-intestinal infections (including dysentery), local causes of diarrhœa, digestive disorders and the parenteral infections or infectious diseases in which diarrhœa was an insignificant symptom. There has been an attempt in recent years to establish the doctrine that infantile diarrhœa is either an infection, usually acquired in hospital or some other institution, or else secondary to a focus of infection such as otitis media. Campbell and Cunningham exclude the first by definition so to speak and show that only 30.5% of their 574 infants had any evidence of parenteral infection on admission and clearly such infection was not playing a dominant part in causing diarrhœa and vomiting in every one of these cases. Thus they were studying the ordinary "d and v" of the hospital receiving room. Nearly 80% of their infants had developed the disease in their own homes, nearly 70% were under nine months of age and more than half the cases began in the five months June–October. Only 18 infants, or 4.5% of those under nine months were breast fed at the onset of the illness and only 3 of these died. Anyone who advises the weaning of a baby on to a bottle—be he medical practitioner, chemist, nurse or lay relative—should realise that he is transferring it from a group in which the mortality from d and v is negligible to one in which it is high. The fatality in the whole of the Park Hospital series was 27.7% but under nine months it was considerably higher—for the first three monthly periods of life the rates were 52.2, 58.1 and 62.7%. Age, in fact, seemed to be the most important feature in prognosis, but another emerging from this series is the degree of dehydration, for the death rate in 283 dehydrated cases was 53% compared with only 2.7% for the 291 non dehydrated cases. In the words of our forefathers the inelastic skin is 'malum signum'. This last observation points the way to what is termed "the most important single factor in treatment"—the relief of dehydration. Campbell and Cunningham advise a starvation period during which water should frequently be given by mouth in small amounts and if parenteral fluid is not being given concurrently half-normal saline should also be given by mouth. Glucose is later added to alternate feeds and next a careful change is made to a separated dried milk using small feeds at regular intervals. Parenteral fluid is best given they say by the continuous subcutaneous route, ringing the changes between normal saline, Ringer's solution and 3% glucose in 0.25% saline. In severely ill patients this should be supplemented in the first twenty-four hours by intraperitoneal or intravenous therapy. Great attention was naturally paid at the Park Hospital—one of the London County Council infectious diseases hospitals—to the general ward management of these infants with diarrhœa. An open ward can only be used with a high risk of complications. Bed isolation is important, with free ventilation, damp or vacuum cleaning and careful disposal of soiled linen. These measures have a familiar ring in connexion with the modern work on the prevention of wound infection in hospital wards. Campbell and Cunningham recommend "dilution" of acute cases by older infants and convalescent cases, and also a system of "feeders" and "changers" which increases the requirement of nurses but ensures that those responsible for the feeds are not also concerned with the toilet arrangements. Destructable squares are valuable for the acute period of the disease and details are given of a system of movable bins and a general team for changing the babies which again has a familiar ring. So also are the remarks on the possibility of infection being conveyed by bath water. Individual isolation accommodation is the ideal method of dealing with these infants. Authorities are apt to regard this as expensive but until preventive measures, including a campaign for breast-feeding are undertaken, the mortality from infantile diarrhœa is too high to allow expense to be used as an excuse for inadequate treatment.

DIRECT PHOTOGRAPHY OF ANTIGENS AND ANTIBODIES

THE electron microscope, by extending resolving power to a practical limit of 50 Angstrom units, has solved several of the structural mysteries of bacteria and other minute bodies. It was obvious that the same instrument would sooner or later throw direct light not only on structure but on mechanisms which hitherto had to be explained mainly by deduction and circumstantial evidence. The lysis of bacteria by phage, the interaction of colloidal gold particles with virus molecules and the combination of virus with antivirus molecules are a few of the biological processes which American workers have already photographed. The electron microscope has now been used to demonstrate the combination of antibodies with flagellar and somatic antigens.[1] A good deal is already known about alterations in cell-walls and in flagella during agglutination of sensitised bacteria and about the combination of antibodies with antigens at bacterial surfaces, but now these changes can be seen in electron pictures. From a hundred measurements of prints of *Bacillus subtilis* Mudd and Anderson compute that the mean diameter of the flagella of this organism is 186 ± 4 Å, but so far they have been unable to produce accurate values for the flagella of *Bacterium typhosum* or *Bact. paratyphosum A*, the other organisms studied. Their next step was to make suspensions of *B. subtilis*, add specific antisera diluted ten times with distilled water (saline produces undesirable crystals in this technique), stand the mixture for half an hour, and finally dilute it with 100 parts of distilled water before mounting. When the flagella

---

1. *Lancet* 1941, i, 777. 2. *Ibid* 1941, ii, 588.
3. *Arch. Dis. Childh.* 1941, 16, 211.

1. Mudd, S. and Anderson, T. F. *J. Immunol.* 1941, 42, 23.

were then examined they were irregularly thickened with many granules attached and the maximal thickness was 167 Å greater than the original mean diameter. The interpretation of these findings is that there has been a deposition of homologous antibodies on the flagella which takes place unevenly and does not form a complete film. Similar results were obtained when mixtures of specific sera with *Bact. typhosum* and *Bact. paratyphosum A* were examined. When, however, a suspension of *Bact. typhosum* was mixed with a heterologous serum the flagella were only faintly visible and the bacterial cells had sharply defined walls, whereas in typhoid-antityphoid serum mixtures the cell walls are fuzzy and appear to be surrounded by fine streamers. The loss of definition in cell-wall outline is explained by a deposition of antibody molecules along its margin. Since the size of certain antibody-globulin molecules is already known[2] it would appear that accurate measurements could show definitely whether the thickness of deposited antibody on an antigen surface was related to the size of the antibody molecule. Something of this sort has indeed been shown with tobacco mosaic virus molecules and homologous rabbit antiserum.[3] There are difficulties, because the antibody-globulin molecules of rabbit antiserum are elongated and may arrange themselves radially to the antigen molecules or they may lie flat against an antigen surface, the arrangement depending among other things on the concentration of serum. These observations are still at an early stage, but it seems probable that a systematic study of deposits and of the orientation and distribution of antibody molecules on fine antigenic surfaces may yet explain some of the puzzles of antigen antibody reactions.

POSTURE AND SLEEP

Men and animals have been so long at sleeping that we should by now have recorded any universal rules governing the attitudes of sleepers. Yet there is still disagreement about the facts, as our correspondence columns have recently shown. Dr. F. Schutz[4] finds that different sleepers take up characteristic postures, and seldom vary them. He notes the preference of patients with angina for the left side and has observed further that patients with affections of the liver or gall-bladder include a remarkable proportion of people who habitually sleep on their abdomen. Dr. W. N. Leak[5] mentions that a preference for sleeping on the left side, associated with nocturnal polyuria, may be a sign of mild cardiac inefficiency; but Dr. F. B. Parsons will have none of it,[6] and quotes the work of Johnson, Swan and Weigand[7] as evidence that we have no fixed postures in sleep but toss about far more than we think. Today Dr. Joah Bates weighs in (p. 186) with a few brisk assertions from Adler. Johnson and his colleagues in America attached a pen to the part of the bed which yields to the sleeper's movements; the pen wrote on a strip of moving paper and every gross movement of the sleeper produced a spike. Children, university students, 112 healthy people and 70 patients in hospital were investigated by this tell-tale device, which showed that the average sleeper moved between 20 and 45 times a night, the movements ranging between single limb movements and complete changes of posture. Nevertheless 20 or 45 movements a night seem a lot to those of us who fancy we hardly stir, and the value of the experiment perhaps depends on whether the victims knew the record was being made or not. The sleeping mind, if all they say of it is true, would not have been above tinkering with the record by spurring the dreamer to unwonted activity. The American workers also took moving pictures of some of their moving sleepers, but as their method entailed a 100 watt lamp over the bed, a taffeta bandage over the eyes and no blankets the sleepers had some excuse for kicking. Something may perhaps be allowed for the temperament of sleepers, and here domestic animals offer a fair field for experimental observation. Most cats are still sleepers, resting hour after hour with limbs tucked away in flexion, and nothing but the rhythmic bellows' action to show the watcher that the creature lives. Many dogs on the other hand are restless hair-trigger sleepers, always on the brink of waking, haunted by strenuous dreams. If there is anything in the idea of physiological types humans may differ as much. A matron of a London hospital, asked to inquire into sleep and posture, set her night nurses to watch the patients. Those who had taken drugs, who had raised temperatures, or who were immobilised by any surgical appliance were ignored and convalescents only were watched. The nurses found that sleeping patients rarely made gross movements; they actually turned over only two or three times in a night and they half wakened to do that. It thus seems doubtful whether Johnson and his colleagues have said the last word about sleepers, at any rate about those on this side of the Atlantic.

MENINGOCOCCAL OPHTHALMIA

Ophthalmia neonatorum with its purulent reaction was at one time regarded as being exclusively due to the gonococcus; but it is now known to be caused by various organisms, the staphylococcus being at least as significant as the gonococcus. Similarly, purulent conjunctivitis in children and adults also has a multiple ætiology; and in this the meningococcus plays a little-recognised part. Metastatic conjunctivitis, serous or purulent, may of course develop in a patient with meningococcal meningitis; but the meningococcus may also be found occasionally in the conjunctival sacs of apparently healthy people, and may sometimes give rise to a primary meningococcal conjunctivitis. The infection may produce a serous or a mucopurulent response, or even a purulent conjunctivitis resembling that caused by the gonococcus. This happens seldom, judging by the scanty—usually single—cases reported; but it is probably commoner than is generally believed, since on superficial examination the gonococcus and the meningococcus—both gram-negative diplococci—are easily confused. Acute purulent conjunctivitis due to either responds well to sulphapyridine, but the differential diagnosis is not altogether an academic exercise. F. Clifton and S. M. Laird have given a useful reminder[1] that purulent ophthalmia is an epidemiological as well as a therapeutic problem. The danger of an epidemic of meningitis originating from a purulent conjunctivitis, particularly under Army conditions, cannot be ignored.

Many hospitals will remember the generosity of Sir Edward Meyerstein, a member of the Stock Exchange who died last Sunday, for his gifts had a discerning quality. At one time it might be a radiological department, at another an athletic ground for the students, or a swimming-bath for the nurses. To the Middlesex Hospital it meant the completion of a cherished building scheme.

---

[1] Jour. R. Army Med. Cps, 1941, 77, 318.

Medical Honours.—The Royal Naval Volunteer Reserve officer's decoration has been awarded to Surgeon Commander J. A. Kerr, M.D. Glasg., who in civilian life is M.O.H. for Grimsby. The King has given permission to Dr. H. C. Sinderson to wear the insignia of the second class (civil division) of the order of Al Rafidain, conferred on him by the King of Iraq. Dr. Sinderson is dean of the Royal Medical College of Iraq.

---

[2] Neurath, H. *J. Amer. chem. Soc.* 1939, 61, 1841.
[3] Anderson, T. F. and Stanley, W. M. *J. biol. Chem.* 1941, 139, 339.
[4] *Lancet*, 1941, ii, 774.
[5] *Ibid.* 1942, i, 26.
[6] *Ibid.*, p. 91.
[7] Johnson, H. M., Swan, T. H. and Weigand, G. F. *J. Amer. med. Ass.* 1930, 94, 2058; and see *Lancet*, 1930, ii, 198.

THE FUTURE STAFFING OF HOSPITALS*

HARRY PLATT
M D LOND, F R C S, F A C S
PROFESSOR OF ORTHOPÆDIC SURGERY, UNIVERSITY OF MANCHESTER

THE future development of hospitals staffed exclusively by general practitioners is not dealt with here In my opinion that type of hospital belongs to a different system which should be integrated with general practice but adequately linked to the specialist hospital system

THE HOSPITAL PATTERN

Hospitals providing specialist services should be composed of a number of established clinics, and comparable in many respects to a university with its professorial departments The term clinic is used here to describe a more or less self-contained department staffed by a team working under a director (physician or surgeon in charge) and comprising both wards and out-patient facilities The established clinics should reflect the pattern of medical science and practice in any given generation, and should fit into the framework of a divisional or regional hospital policy

The position of director of a clinic should represent a career in specialist medicine which will offer a way of life to men and women of high ability This should apply not only to the posts in a university hospital centre and in the non-teaching key hospitals, but equally to hospitals in the smaller cities or towns It is moreover an essential feature of a national policy for the coordination of hospital services that the same opportunities should be offered in the municipal hospitals as in the voluntary hospitals The staff of a hospital should, contrary to architectural principles, be built from the top down The directors of clinics should be appointed by selection from an open field, as in a university, and not by automatic promotion from the junior honorary ranks of the same hospital Only in this way can we prevent the continuous sterilisation of senior appointments by men who turn out to be indolent, unprogressive, self-satisfied or—equally fatal to progress—who display a high standard of mediocrity It is true of course that even by the method of selection a hospital like a university may occasionally appoint the wrong man, but if his tenure of office is open to review at the end of five years, mistakes can be rectified It should be possible for men who have created a high reputation in charge of clinics in smaller centres to move on to larger centres, or to be chosen as heads of university clinics The men of outstanding ability—who in any nation must necessarily form a very small elite—will in this way be competing for the positions which carry the highest academic status Many able men of lesser distinction will remain on the non-teaching key hospitals or in the smaller centres, and will there find ample scope for an honourable and useful career in specialist medicine

Clinics directed by consultants and specialists should be much larger on the average than has been the custom in the past What we need is not more, but fewer heads of departments in each hospital, with an ample supply of associates and assistants of varying rank appointed for limited periods (In many of the smaller hospital centres the associates would be general practitioners, and this would provide a valuable link between specialist medicine and general practice) This pattern should apply to the smaller as well as to the larger hospitals The present overcrowding of hospitals with a larger number of independent small units or firms traditionally regarded as an introduction and later on as an appendage to unrestricted private practice, will tend to disappear naturally as more established specialist appointments become available in all hospital centres which serve a population of agreed size

CONDITIONS OF APPOINTMENTS

All directors of clinics in both voluntary and municipal hospitals should be part-time salaried officers, but with an obligation to the service of one main hospital The traditional multiple hospital commitments—two half-days here, two half-days there, one-half day elsewhere—should be prohibited In the present economic state of society it is desirable that the part-time appointment should remain the basis of the system of staffing True whole-time appointments in clinical departments are best confined to research professorships, readerships in university clinics and of course to posts for junior officers (chief assistants, research fellows and registrars) who are still in the stage of apprenticeship In those municipal hospitals in which whole-time specialists have already been appointed that system will no doubt be continued for some time to come A limited number of such hospitals may fit harmoniously into any future pattern of staffing, but local authorities should be urged to adopt the part-time system for all future specialist appointments if a unified service is to be created throughout the country

The salary of a director of a clinic should form a substantial part of his income, thereby emphasising that his main preoccupation throughout the whole of his career is his hospital appointment His salary should not be reduced as he becomes more senior and his knowledge, skill and authority increase, on the contrary, it might well increase as it does in all services, civil and military and in professional appointments in general The successful man at the head of a clinic who finds the claims of private practice seriously encroaching on hospital work and teaching must be told that he is at the parting of the ways If he feels that the public need him and he elects to make private practice his main objective—an honourable enough ambition—he should be required to relinquish his hospital clinic and make way for someone else Such men will find a useful niche as private consultants, the best of them can be used for limited part-time hospital service and in the practical instruction of students, but with associate rank and not as directors of clinics On this question there should be no compromise

The scale of salary should also be commensurate with the status of the appointment, and the lowest salary should be one which will yield a reasonable pension We may have to contemplate a reduction to something like the pre-war standards (or even less) of the smaller democracies like the Scandinavian countries, Switzerland and Holland, where professorial salaries ranged from £620 to £735[1] In Sweden the same salary is paid to the directors of non-university clinics in the larger centres The following figures are based on the old economic standards of remuneration in this country, and are put forward as a basis for discussion

University professorial clinics (Salary derived in part from the university, in part from the hospital)	£1500 to £2000
Key hospital clinic	£800 to £1000
Small town hospital clinic	£600 to £800

The time to be allotted to private practice should be clearly defined in the terms of all appointments, in university hospitals a strict limitation is essential The following principles should be embodied in all hospital appointments

Overhead expenses of private consulting practice—the glittering façade—should be reduced by providing each head of a clinic with a consulting room suite within the hospital precincts, and secretarial assistance Where practicable these privileges should be extended to selected members of the associate staff

A limited number of pay beds should be available for each clinic, in university hospital clinics these beds should wherever possible be attached to the ward unit and not be in a separate pay block The professor should be removed from the atmosphere of competitive medicine

STATUS OF HEADS OF CLINICS

The head of a clinic in every grade of hospital should be given full executive clinical authority over his own department This authority should be comparable to the control exercised by heads of university departments Such a status obtains to a large extent in most voluntary hospitals, and especially in the great teaching hospitals but as a general rule in the municipal hospitals medical superintendents are still vested with overriding executive powers With the appointment in municipal and county council hospitals of directors of clinics—picked men representing the highest talent of the profession—the duties of medical superintendents should be modified. They should confine themselves entirely to matters of hospital administration. Administrative medicine is a career in itself and should demand a highly specialised training; there is widespread feeling that until this change is made, a specialist career on the staff of a municipal hospital will not attract the ambitious type of man.

---

* The substance of a memorandum prepared for the Medical Advisory Council of the Nuffield Provincial Hospitals Trust of which the writer is a member and published at their request

[1] The Smaller Democracies Sir F D Simon Gollancz 193

The heads of clinics in all types of hospitals should be primarily responsible for advising on future developments in domestic clinical policy. In municipal hospitals, this advice should be transmitted through the medical administrative head of the service—the medical officer of health—to the public health committee of the authority. The head of a clinic should have the privilege of nominating but not appointing his associates, assistants and house officers, either directly to the governing body, or through a medical committee composed of heads of clinics.

In university hospitals the directors of professorial clinics should be allotted budgets which they can spend on their departments in their own way. This system might with advantage be ultimately extended to non-professorial clinics and to the clinics of the large non-teaching key hospitals. The main arguments against the purely whole-time system for university chairs in clinical subjects are these:

A professor in a clinical subject is likely to possess unrivalled knowledge in some particular field. This knowledge, as well as operative skill where needed, should be available, with certain reservations, to all classes of patient within the precincts of the hospital. The professor must practise inside the hospital: patients must come to him—if need be from all over the world. For such services the professor should be entitled to charge fees and thus augment his basic income.

For some time to come until a new social pattern emerges, the professor, as a result of the wider contacts arising from private consultations, will enjoy greater prestige in the eyes of the public and greater status in the local and national councils of the medical profession. These contacts are powerful influences in the making of a whole man, and it is such men to whom the profession must look for intellectual leadership.

Election of heads of clinics should follow a university model: advertisement, an open field, a selection committee advised by a panel of professional experts with assistance from outside referees for the most important appointments and finally, a short list, to be submitted to the electoral body. In the choice of expert advisers, and outside referees, regional or divisional hospital councils should be consulted. All appointments should be made in the first place for a period of five years.

Associates and assistants should not be appointed as part of the permanent establishment of the hospital. Nomination by heads of clinics has been the custom in the hospitals of the United States and Canada for many years, and the system undoubtedly works well. It is essential in university professorial clinics, but in hospitals of lesser rank opposition from existing lay and medical interests may be anticipated before the method is finally accepted.

REGIONALISATION

This pattern of hospital staffing foreshadows for every zone of the population (that is for every 100,000 inhabitants) the ultimate provision of complete specialist services based on well-equipped hospital clinics in charge of specialists resident in the area. It is assumed that some of the more highly specialised services—neurosurgery, thoracic surgery, radium centres—will be regional or divisional responsibilities. The system is seen at its best in the Scandinavian countries, where every citizen, even if living in remote parts, has access to specialist hospital services maintained at a high standard. If we can lay the foundations of such services here we can check the growth in numbers of travelling consultants (more especially "carpet-bag" surgeons) who descend at intervals on the smaller hospitals—a system which results from the overstaffing of the great hospital centres. It is to the advantage of any community to have a scholarly group of specialists living in its midst, contributing to its civic and cultural life and enhancing the standards of medical practice as a whole.

Three main types of hospital providing specialist services have been discussed—university hospital centres, non-teaching key hospital centres, and hospitals in the smaller towns. It has been suggested that a secure and intellectually satisfying career in specialist medicine can be made available in any one of these types of hospital centre, though in those smaller centres where the prospects of augmenting the basic income by pure consulting work are small, some of the medical clinics might be placed in charge of able men engaged in a restricted form of general practice. How can the three types of hospital centre be welded into a coordinated scheme? The doctrine of regionalisation has aroused suspicion and misgiving in the hospital world, but I use the term to cover only the laudable effort to create from a number of overlapping interests a more economical hospital system. This is a problem in national and regional hospital administration. The link we should envisage between the three types of hospital centre is an intellectual bond, stemming from a common purpose—a high standard of medical science and practice. This is implicit in the system of staffing described above, a system based on the deliberate selection of the best only as leaders, and the provision for them of every facility for the flowering of their talents. We do not therefore need to look too deeply into the future for any fixed pattern of lend-lease amongst the staffs of the three types of hospital centre. Staffs so selected would in time constitute a true national service, attractive because only the highest professional talent can gain admission, a service in which competition will be centred on intellectual not material awards. In such a service the standards of university medicine would be reflected in all specialist centres, both great and small.

In England Now

A Running Commentary by Peripatetic Correspondents

THE visit to the first-aid post I had helped to create in September, 1939, was like a leap into a new era. Looking at the rows of streamline grey ambulances, the stretchers, the piles of blankets, the profusion of tin hats and respirators, I thought of the appalling lack of equipment (bar forms) that had faced us in those early days and marvelled at the happy circumstances that had saved us from attack and annihilation. With our growing strength it has become the fashion to expose our past deficiencies, and after those ambulances (plural) I feel I must unburden myself about our First Ambulance. It had started life many years before as a plain—very plain—van, and by the time the local council had claimed it, senility had infiltrated not only to the chassis but to intimate parts of the engine. All the same it was an official ambulance, and because it added tone to the establishment we and the ambulance depot up the road fought for nightly possession of it. Why we were so warm I cannot now imagine, for its defects were legion. It had no tools but compensated with an incurable slow puncture and big-end debility. It was almost impossible to get it started, but once in action it compared favourably, for noise, with a squadron of bombers. In every way it was a rogue ambulance, even down to the two wooden stretcher pegs that would suddenly fly out of position, presumably with the malicious intention of hurling the patient to the floor, and stunning the attendant at the same time. The man who delivered it in the first place had had his temper soured in the process, and after remarking bitterly that it was not worth the paint on it he spat contemptuously in the bushes and marched away. The authorities tried to carry things off with a high hand by sticking a notice on the front: "This vehicle must not be driven at more than twenty miles an hour for the next five hundred miles, subsequent to reboring." Some scoffer had added "By order of King Charles the First." Finally it packed up altogether and was removed by a desolate-looking man in dungarees.

Unlike the equipment, the staff of the post was practically the same. A few new faces ornamented the duty room, but most were the pioneers who survived after the first rush to the barricades receded, taking with it the notably unsuitable. These had varied from victims of physical disabilities, such as total deafness and advanced pregnancy, to the innocent who answered "Conceptionist" when asked what section of the personnel she had elected to grace.

In those early days it was the frenzied patriots who caused the greatest trouble; they were far more difficult to deal with than the frank yearner after £2 a week Even after two and a half years Mrs Droop is still mentioned with bated breath She was one of our earliest volunteers a tall scraggy woman with a deceptively meek manner masking the ruthlessness of a tank · and she talked incessantly By incessantly I mean incessantly Having prominent teeth and being a mouth-breather she was not hampered by having to pause for breath, and we listened in involuntary silence while she told us how badly the whole post was organised · how much better she could have done it—were it not for her native bashfulness and dislike of pushing herself forward—and her determination (even if it involved complete loss of efficiency) not to take any position of authority. She invariably rounded off with the remark that no doubt it was the experience she acquired in running her home for fallen girls that made her specially understanding of our position Then there was her uncompromising attitude to the pay-roll When asked if she intended to work on a voluntary or a paid basis she treated us to a little sermon on the ideals of the Droop family—how they scorned all sordid financial considerations even in the wear and tear of normal life. That money should be mentioned in connexion with national service was unthinkable—and so ad infinitum But at last when she had not only frayed but ravelled the nerves of her listeners she departed in floods of tears, asserting that she would not take orders from every Tom Dick, and Harry, and breathing sinister threats about reporting us to the War Office and the General Medical Council

* * *

Among the infants that emerge from this orgy of planning I do hope one will be a Medical Patent Office to test and register medical and surgical inventions Come and spend an hour or so in this putative institution. That's the secretary's room that door leads to the waiting-room at the back there are the testing laboratories This is the interviewing room Sit with me at the interviewer's desk. Touch that bell, please A dapper little man, carefully carrying a parcel bustles in "I'm John Doe surgeon at the Mudshire Cottage Hospital you know This is a urino-speedometer. a device on the principle of the anemometer with revolving cups which register the speed of the wind but in my apparatus the rate of flow of the urine Easy to apply and very comfortable. I find that in enlarged prostate cases the dial records somewhere between flat calm and light breeze, while in healthy young adults it often goes up to hurricane" "Very interesting Perhaps Mr Doe, you could give us a demonstration '

"Well as a matter of fact—just before I came in . .'

"Quite quite Come back in an hour and I'll arrange for you to go straight to the laboratory Next please.'

A rather sinister-looking individual comes in Dr Squirps

'I want to patent Squirps s sign ' he says huskily "And what is this sign Dr Squirps ?" "I've noticed when I am examining recruits for hernia and tell them to cough many look down suspiciously and cough down my neck while a few put up their heads and cough at the ceiling That's what I call a positive Squirps and it s very rare ' And what do you think it s a sign of doctor ?' ' Confidence in the doctor undoubtedly "Very well patent granted Good morning

When the next applicant came in we thought a street vendor must have been let in by mistake—the little man was covered with balloons of all sizes and shapes "These balloons he explained "are lined with a light-sensitive emulsion This one you see is in the shape of a stomach—medium men's size When it is deflated so, and rolled up with a tiny bulb inserted in it so, it can be easily swallowed with a wire running down a rubber tube attached You then inflate it till it is comfortably tight—all in the dark of course—take your exposure deflate pull it out develop "What develop the balloon ?" "Yes quite simple and there you have a cast of the man s stomach in your hand These round ones are for the bladder these little worms are male and female urethra balloons, this boa-constrictor does the whole of the colon Let me show you some of my results Here now is a carcinoma of the hepatic flexure " The next applicant was a lady and a would-be humorist. She pretended to hand us her invention and let it sail up and hug the ceiling Hydrogen pessary " she beamed proudly no tendency to come down '

Last week we had a helium one Much safer—non-inflammable Patent refused *Good*-morning

* * *

To one born and bred in a southern county there can be nothing that so perfectly typifies the English country scene as the chequerboard of meadow and hedgerow that from any vantage point on the Downs may be seen as a rolling crazy patchwork stretching to the scattered clumps of woodland and to the sea It is typically English since in no other country is land so universally divided by hedges Even the stone walls of the north familiarly beautiful though they are to northern eyes are to the southerner too cold too bare too bleak-looking to replace in his affection the green hedgerows of the south. As for other lands is it possible that a straggling row of mutilated poplars could ever vie with the hawthorn and the blackthorn ? Or can the wire fences of younger and more utilitarian lands ever attain to a sentimental or æsthetic feeling in one separated from them by travel ? There are lands in which hedges are made of all sorts of strange plants from the horrible South African boxthorn to prickly pear—the great distorted, tortured opuntia cactus But there are no hedges like the hedges of England, for at every change of season the English hedge takes on a new beauty

There is one type of peculiarly English hedge that has always been especially dear to me The double hedge and ditch is, I suppose the most stupidly wasteful form of land division that man could possibly devise but to me it has always been particularly cherished because in my boyhood it afforded me my most wonderful hours of happiness It is I fancy a dying type and probably its passing will be no loss to agriculture In its prime it consisted of a ditch sometimes water-filled sometimes dry, bordered on either side by tall hedges of hawthorn and blackthorn whose branches interlaced above It was a shaded tunnel with puddles pools or a running brook between as the season dictated It was here the butcher bird nested here that the hawfinch built its inconspicuous nest and lower down the hedgesparrow. and in the nettles at its foot the whitethroat Here was the place to set the kingfisher net and then walk along the ditch towards the net watching the birds that fled down the tunnel each to find its place in this, the acme of human ingenuity in the painless capture of living wild creatures

But it was not of sentimental memories of the hedgerows of my boyhood that I intended to write as a consequence of looking from the train window as I travelled to London from the north My thoughts had a far more utilitarian attitude towards the hedgerows of present England As a schoolboy one of my friends was an old type hedger and a hedger was then a skilled craftsman There are many young people who think that a hedge is no more than a row of hawthorns or other trees planted in a line and permitted to grow Apparently from the general neglect of hedges and hedging there are many older people who share this view But the making of a hedge is—or was—a highly skilled business for a hedge should be properly ' laid ' and trimmed by a skilled hedger The laying of a hedge is the partial cutting partial bending of actively growing wood into a horizontal position so that from the living branches there are made, not only the equivalent of the uprights or strainers of a wire fence, but also the horizontally stretched wires A properly planted and properly laid and trimmed hedge is impassable to man or beast. But once a hedge ceases to be properly tended it is useless for either purpose In the whole of my railway journey I did not see one hedge save perhaps some of those immediately bordering the railway line that had been so well tended as to serve its original purpose There are hedges surfeited with the overgrowth of years hedges with gaps filled in with barbed wire hedges with wide gaps that are not filled in by anything hedges reduced to a series of straggling bushes with here and there an elm or an oak to mark the old line hedges weed-grown at their foot sprawling over valuable land and focal points for further invasion

No bird-lover can grudge England her hedges The hedgerows are the nesting sites of our summer migra-

and residents, the winter larders of our winter migrants and of our own native stocks But our hedges are just as much a part of English scenery, just as secure a sanctuary and as certain a larder for English birds, if they are kept as the hedger of my boyhood kept them, as trimmed and skilfully laid barriers impassable by man or beast

Can it be, I wondered to myself as I looked from the window of my railway carriage, that this vast overgrowth of hedges in the English countryside is not due to mere neglect by the farmer? Is there some other reason? A newspaper writer has recently claimed that "the hedge is allowed to grow thick and high because it affords convenient nesting places for game birds at its foot and because it forms a convenient wall for them to be driven over in the shooting season" I do not know if this is correct, but from a consideration of the rabbit which has exercised me so much on my railway journeys, I am a little disturbed Surely it cannot be that the English countryside is being ordered for the purposes of sport rather than of land utilisation for food production? If this is so we are paying a terrible price in loss of good land, in the dissemination of hedgerow weeds, and in the harbouring of sparrows at harvest time by permitting the useless overgrowth of our English hedgerows

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS M P

WE have passed from the three days of searching debate on the war situation, which dominated the news last week, into the quieter waters of ordinary Parliamentary business A great occasion like this conflict of the people's representatives set on a grand stage has the disadvantage of overshadowing other major affairs the significance of which is less brightly illuminated by the spot-lights of discussion

On the day on which Mr CHURCHILL made his first speech Sir ARNOLD GRIDLEY asked the Minister of Economic Warfare (Mr Dalton) about the provision of food for "our starving ally Greece" Other questions have been asked, privately, about the shocking conditions known to exist in Poland and in all parts of Nazi-subjugated Europe For most of these areas any aid from Britain or permitted to pass by Britain, is impossible because it would be directly appropriated to their own use by the Nazis and not help the sufferers But the case of Greece is so bad, especially in Athens, that the Government have authorised the passage of a single shipment of 8000 tons of wheat This will be distributed under the authority of the International Red Cross, but its shipment to Greece depends on the provision of shipping and the arrangement of a safe conduct by the enemy, and both will cause delay In addition to this, however, the Turkish Government are willing and able to export to Greece certain foodstuffs, including eggs, which they themselves produce This export from Turkey is one of the few thin strands of prewar trading arrangements which still exist in Europe

Mr DALTON said that in allowing the shipment of wheat we were deliberately running a risk in view of the appalling conditions created by the Germans in Greece What the effect of the starvation conditions in Europe is on the civil population is difficult to calculate, but what the effect is on the epidemic situation in Europe seems to be a matter which is likely to give the Nazis grave concern from a military point of view Bacteriological warfare was a form of fighting always considered by the German machine as a possibility, but it is a weapon which the Germans may be forging for use against themselves by creating conditions of deprivation—conditions which it is in their power to abolish by equalising distribution—under which epidemics will arise as destroyers The blockade of Russia in 1920 led to epidemic conditions in which some millions of lives were lost Guns may have been better than butter for Germany for a time, but epidemics may be stronger than the orders of the Gestapo in the next twelve months

Another aspect of the nutrition problem is being brought before Parliament in a motion sponsored by Sir Ernest Graham-Little and a large proportion of the medical members of Parliament, as well as many non-medical This resolution calls for a select committee to find out what are the considerations which obstruct the exclusive provision of a national wheatmeal loaf of the highest practicable extraction The point of the demand is that it is feared that the reasons operating against the production of this type of loaf are not based on the science of nutrition but on the interests of commercial firms The resolution has not yet been given a place in the Parliamentary time-table, but opportunities for discussion will arise, and medical members intend to press for the appointment of the select committee

FROM THE PRESS GALLERY

Other People's Rations

We all enjoy an occasional grumble about rationing but the debate on Jan 27 in the Upper House on the food situation in Europe made clear the difference between having to put up with inconvenience and not having enough to eat After Lord PORTSEA's moving appeal that a shipload of food should be sent to Jersey and Guernsey Lord PONSONBY rose to ask what the Government knew of the famine situation among our allies in Europe The Belgian prime minister had said that the population of his country was even now in a state of famine dangerous to public health and the future of youth Lord Ponsonby wondered whether the commission which went to Poland to distribute food to children was still at work and he specially stressed the needs of Greece which before the war was dependent for half its food on sea-borne trade Medicine and surgical appliances were said to be already unprocurable there, and Dr Cawadias, chairman of the Greek Red Cross in London, had reminded us that the Greek merchant navy is now bringing food to Britain instead of to Greece We could not be indifferent to the danger of pestilence and famine, but above all we should see that the children of today are not allowed to grow up maimed, crippled, dispirited, and children of despair It was no good saying it is Germany's responsibility and we have nothing to do with it Abusing Germany and Hitler will not feed these children He hoped that we might hear that the Government was giving attention to projects for bringing relief, under proper control, to the suffering of these wretched people The Bishop of CHICHESTER pointed out that the inability of the people in occupied territory to resist when the time came was not to our interest Nor was it to our interest that they should survive only as exhausted peoples unable to make any contribution to the reconstruction of Europe after the war Lord CECIL, who replied for Lord Cranborne, said that everyone agreed that the blockade is an odious weapon But it was one of our strongest, and at the present time almost our only offensive weapon He did not wish to underestimate the suffering of people in Europe today but it was not everywhere equal In rural districts, except in Greece, parts of Yugoslavia and northern Norway, there is at present no considerable shortage of food, but in the towns the position was not nearly so good Still out of the population of 130,000,000 in occupied Europe about 60,000,000 are living not much below pre-war level In Holland, Czechoslovakia and Norway there was no serious undernourishment but in occupied France the position was probably rather worse and in Belgium considerably worse There a large section of the urban population are at the moment chronically underfed To sum up simply—compared with the normal daily requirements of 3000 calories, Czechoslovakia and France had 2300, Belgium 1900, the Netherlands 2250, Denmark 3100 (over normal), and Norway 2500 But in certain areas within those countries there was considerable stress and hardship Suffering was worst in Poland and Greece It was difficult to get accurate information about Poland, but it is almost certain that in Warsaw and other big towns there are people going very short He did not know if the commission for relief in Poland was still in existence Greece was in a different category The Germans do not require Greek labour and therefore do not need to feed the Greeks, and there is no doubt that the people of Greece are suffering appalling privations Where other countries are suffering want they are the victims of famine Lord Cecil had heard stories of people falling dead in the streets of Athens from sheer starvation, and he was glad to announce the Government's decision to authorise a shipment of wheat to Greece But in spite of this exception the Governments of Britain and the United States continued to maintain that it is incumbent upon the enemy to feed the countries he has occupied

QUESTION TIME

Red Cross Brassards

Brassards with the Geneva Cross are issued to all officers of the Army Medical Services in accordance with article 21 of the International Convention for the amelioration of the conditions of the wounded and sick in armies in the field These brassards are required to be worn when serving in a theatre of active operations, and in connexion with operational exercises when so ordered by a general officer commanding (Captain H. D R **Margesson** in reply to Mr T E. **Groves**)

Priority in Emergency

The medical officer of health would not call on a doctor to assist in the services under his control if the doctor were actually engaged at the time on urgent private work (Mr E **Brown** in reply to Mr **Groves**)

Shelter Medical Officers

Dr H B **Morgan** asked the Minister of Health whether he was aware that at least two of the shelter medical officers employed and under contract for medical service at Liverpool Street station underground shelter lived away from the district, one in Kilburn and one in a southern suburb, on what grounds were such medical appointments made, and why badly hit medical practitioners in the surrounding and nearby districts were, and were not now, employed for this work whether those appointed attend regularly or only when the alarm was sounded, and what remuneration was attached to these appointments —Mr **Brown** replied These appointments were made by the City corporation as the responsible shelter authority The corporation had represented that there were no medical practitioners normally resident in the City who were willing and able to take on the work. The corporation were therefore authorised to appoint four full time shelter medical officers at a salary of £500 a year each. The officers come on duty at the beginning of the black out, visit each of the large public shelters, and remain on-duty at the City control centre all night

Rural Whole-timers

The numbers of rural district councils in England and Wales who, either as individual councils or jointly with other councils, have whole time medical officers of health and sanitary inspectors respectively are 259 and 464 (Mr **Brown** replying to Sir **Percy Hurd**)

Fitness for Overseas Service

Only personnel of medical categories A and B are considered fit for overseas service Before mobilisation for overseas officers, nurses and other ranks who appear to be below the standard of fitness required for their unit are transferrd to a unit where a lower standard of fitness is accepted or brought before a medical board Between mobilisation and proceeding overseas weekly medical inspections are carried out to ensure freedom from infectious or contagious diseases (Captain **Margesson** in reply to Mr W **Dobbie**.)

Milk for TB Contacts

Mr J **Parker** asked the parliamentary secretary to the Ministry of Food whether he was aware that contacts of tuberculosis provided a considerable source of new cases and since the maintenance of adequate nutrition was as important for the prevention of this disease as for its treatment, would he extend the schedule of conditions qualifying for priority claims on liquid milk which now applied to active tuberculosis only, to include adult and child home contacts of active tuberculosis, other than those covered by school or other milk schemes, where the tuberculosis officer considered that this would be beneficial —Major G **Lloyd George** The Milk Priority Scheme is strictly in accordance with the recommendations of the (special diets) advisory committee of the Medical Research Council I regret that it is not possible to extend priority to all tuberculosis home contacts who are not at present eligible under the scheme

Silicosis Reports

Mr **James Griffiths** asked the Lord President of the Council if the investigation into the incidence of silicosis among coalminers in South Wales had now been completed, and if he could make a statement indicating the findings of the committee and their recommendations —Sir **John Anderson** replied The investigation has been completed A full report on the medical studies is in the press, and will be available in a few weeks, it will be prefaced by a statement giving the findings and recommendations of the committee A second report which deals with the environmental studies is almost ready for printing

Additions to Canadian Flour

The only substance added to Canadian flour before export, under instructions from the Ministry of Food, is aneurine (synthetic vitamin B_1), which is added to bring the B_1 content to a figure similar to that of fortified flour produced in this country It is understood the position in regard to chemical improvers and bleachers in Canadian and other imported flour is similar to that of flour milled in the United Kingdom Imported flour is not chemically bleached after arrival in this country (Major **Lloyd George** in reply to Sir E **Graham-Little**)

Nurses who should have Registered

Legislation would be required to enable nurses who failed to apply for registration as existing nurses within the period of two years ended May, 1925 which was allowed by the rules of the General Nursing Council under the provisions of the Nurses Registration Act, 1919, to be admitted to the Nurses Register without satisfying the conditions applicable in the case of other applicants for admission to the register (Mr **Brown** in reply to Captain W F **Strickland**)

Veterinary Research in Scotland

Mr G **Mathers** asked the Minister of Agriculture how Scottish-opinion and experience were obtained in respect of veterinary diseases, and what connexion was maintained with the Scottish Department of Agriculture with regard to research —Mr R S **Hudson** replied The organisation of all matters connected with animal disease is uniform throughout Great Britain Scottish opinion and experience is available through channels corresponding to those in England and Wales In addition, one of the Ministry's superintending veterinary inspectors is stationed in Edinburgh for liaison duties Coördination of research is secured through the Agricultural Research Council which considers and advises on programmes of research in both countries In addition direct contact is maintained between the officers of the two departments of agriculture concerned with research

OPENING OF THE CHURCHILL HOSPITAL

On Tuesday of last week the Duchess of Kent opened the new Churchill Hospital at Headington which is now to be the home of "The American Hospital in Britain" The venture was made possible through the British War Relief Committee (of America) whose representative, Mr Bertram de N Cruger, attended the opening ceremony The Minister of Health was also present It was in August, 1940, that a group of American surgeons under Prof Philip D Wilson, orthopædic surgeon at the New York Hospital for the Ruptured and Crippled reached this country and they have since been working at Park Prewett At the suggestion of Professor Girdlestone the unit was invited by the Wingfield-Morris Orthopædic Hospital to occupy the adjacent EMS hospital building, and has moved from Basingstoke to Oxford to become a sort of alter ego of the Wingfield-Morris administered by its committee for the EMS with Professor Wilson in independent clinical charge The twin flagstaffs will accordingly fly Stars and Stripes and Union Jack About two-thirds of the hospital will be orthopædic Churchill and Wingfield together forming the Oxford Orthopædic Centre but Professor Wilson has brought over, in addition to orthopædic surgeons Dr John M Converse for plastic surgery, Dr Rogers of McGill for general surgery and Dr Kirkland who will be in charge of medicine and clinical pathology The staff at present includes 12 doctors and about 50 American and Canadian nurses with Mr John Crane as superintendent The wards which provide 600 beds are built around a courtyard to the design of Mr R F Dodd each ward with its own air-raid shelter At Basingstoke the unit already proved its worth in training American surgeons in methods of war surgery and the promoters hope that the Churchill Hospital may eventually be taken over by the

U S Army as its first base hospital The weather was severe on the opening day but when Sir Farquhar Buzzard proposed the principal toast at the lunch and Professor Wilson replied there was ample reason to foresee a cultural as well as a scientific fellowship between the two countries represented

---

Obituary

PERCY KIDD

M D OXFD, F R C P

By the death of Percy Kidd our profession has lost not only an eminent clinician but also a great gentleman "P K" (as he was always called) was a physician of the Victorian age—a careful clinical observer specially skilled in the use of the stethoscope and gifted with sound common sense and judgment His bedside teaching was valued by his students for its insistence upon the importance of physical signs although a certain natural diffidence made him less successful in the lecture room He wrote little and chiefly on diseases of the chest but he never wrote unless he had something to say His handsome well-cut features—and his equally well-cut clothes—his active and upright figure, and his charming and invariable courtesy were notable in any gathering, but an essential modesty made him backward in expressing his opinion in committee, although when he did so he was sure to be on the side of the angels Himself a man of the highest principles he had no patience with anything mean or mercenary, or which offended his rigid sense of professional honour, and when confronted with such he could show real anger

"P K" had many interests outside medicine Up to an advanced age he rarely missed a fortnight's spring salmon fishing in Scotland and he was a keen golfer and a musician of considerable technical ability The last years of his long life were clouded by increasing failure of mental and physical powers, and by the death of his devoted wife So there is really nothing for tears in his passing, the last summons must have come to him as a release

R H

Elliott & Fry

Percy Marmaduke Kidd was born in 1851, second son of Dr Joseph Kidd, who (himself the seventeenth of 18 children) dedicated five of his 15 children—Percy, Walter, Leonard, Frank and Mary—to the profession of medicine He was educated at Uppingham, where he was athletic champion, and Balliol College, Oxford, where he was Radcliffe travelling fellow, qualifying from St Bartholomew's Hospital in 1878 There he was house-physician to Samuel Gee, medical tutor and casualty physician, until after getting on the staff of the Brompton and City of London Hospitals he was in 1890 appointed assistant physician and pathologist to the London Hospital, later becoming lecturer on the principles and practice of medicine The Royal College of Physicians elected him fellow in 1885, councillor in 1903, censor in 1911, and Harveian orator in 1918 The oration was remarkable in its insistence on the need for better understanding of the pathology of tuberculous infection Recalling Thomas Willis and Richard Morton he ended with the cry of the disillusioned prophet, "I am not better than my fathers" Some idea of his own intense interest in the problems of seed and soil may be gained from the following selection from his published writings

(1875) Spontaneous Movements of Nucleoli *Quart J micr Sci* (1877) Early Development of the Hen's Egg *Ibid* (1878) A Contribution to the Pathology of Hæmophilia *Med-chir Trans* (1883) Diphtheritic Paralysis *Ibid* (1884) Unusual Case of Pulmonary Aneurysm *Trans path Soc Lond* (1885) Fatal Hæmoptysis from Hydatid of the Lung *Ibid* (1886) Basic Tuberculous Phthisis *Lancet* (1888) Phthisis Pulmonalis *Allbutt's Syst of Med* Sputum *Quain's Dict of Med* (1895) Diseases of the Respiratory System *Bain's Dict of Med* (1910) Clinical History of Pneumonia *Polyclinic Lecture* (1912) Some Moot Points in the Pathological and Clinical History of Pneumonia *Lumleian Lect R C P* (1918) Doctrine of Consumption *Harveian Oration*

Dr Kidd married in 1881 Gertrude daughter of Major General T B Harrison, and they had three sons She predeceased him in 1940

ARCHIBALD KERR CHALMERS

M D, LL D GLASG, F R F P S G, T D

Dr A K Chalmers, who died on Jan 24 in his eighty-sixth year, was for nearly 33 years medical officer of health for the City of Glasgow retiring in 1925 Born at Greenock in 1856 he was educated at Glasgow University, where he qualified M B with high commendation in 1879 For the next few years he was resident at the fever hospitals for the city and the joint authorities (at Maryhill) taking the D P H Camb in 1889 Two years later he entered upon his public health career when he was appointed colleague to James Burn Russell, and in 1898 succeeded him as M O H Chalmers's tenure coincided with the transition between the more purely environmental services and the personal services on which modern public health is founded At the same time he never lost sight of the fact that improved environment lay at the root of a sound health organisation, and housing reform in particular was one of the paramount aims of his administration, indeed, his studies of housing in relation to health were widely quoted and used as illustrations to point the way to modern housing and town-planning legislation His pioneer work on defects in school-children also paved the way for legislation His attitude to these and other public health problems was that of the investigator, and his writings were notable for combining the results of his inquiries with practical administrative ideals, although advance was slow and not at all proportionate to his enthusiastic advocacy But he saw in his lifetime the conversion of rickets from a disease causing obvious bony deformity to a deficiency disease which could be avoided by healthy nutrition

Elliott & Fry

Like many others who served him in the public-health department, writes A S M M, I consider myself fortunate in the association with a man who set the highest standards for himself and his staff His reports were accurate, clear and convincing His long experience had furnished him with a wealth of knowledge, always freely placed at the disposal of his colleagues so that it was a delight to discuss with him the day-to-day work of the department and to argue plans for the future I have rarely come into contact with a mind so richly endowed, so fertile in ideas, and it would take too long to recount all his administrative achievements He had to deal with a number of menaces to public health such as bubonic plague, smallpox, typhus and other epidemics He laid the foundations of the maternity and child welfare service, the tuberculosis and V D schemes he clearly perceived the wide range of functions that infectious hospitals could serve, particularly in the treatment of pneumonia and in the simpler infections of childhood Part of his retirement he devoted to a survey of the progress of sanitary, preventive and housing measures in the city from 1818 to 1925, published in a volume entitled "The Health of Glasgow" In his early years he was an enthusiastic volunteer, holding the rank of surgeon-major to the 1st Lanark field artillery branch When the medical department was reorganised under the Territorial Forces, he became chief sanitary officer of the Lowland Division, with the rank of lieut-colonel, serving as such in the last war In addition to other distinctions he was president in 1913 of the Society of Medical Officers of Health

Dr Chalmers married Margaret Jessie, daughter of Henry Stewart of Glasgow They had three sons, one of whom was killed in the last war

Letters to the Editor

HUSBANDING OF LIVER EXTRACTS

SIR,—In your leader of Jan 24 (p 110) it is stated that the usual method of treating pernicious anæmia is to inject small doses of liver extract every one or two weeks By 'small dose" is presumably implied the usual content of one ampoule, that is to say 2 c cm Further a statement is quoted to the effect that it takes "more liver extract to maintain a patient in remission by the depot method than by the weekly treatment method"

It would be unfortunate if either of these propositions gained acceptance The records of this pathological department cover the treatment of some 200 cases of pernicious anæmia over the past fifteen years These make it quite clear that the vast majority are maintained in a satisfactory state of remission on a dose of 4–6 c cm of a fully potent liver extract once every two to three months Except in the early stages of treatment weekly doses are never given These results are probably due to the fact that no liver extract is used in routine treatment until the efficiency not only of the particular preparation but also of the actual batch has been tested in the department This is made possible by arrangement with the manufacturers The criteria of potency adopted are the reticulocyte and red-cell responses to a standard dosage , data and formulæ covering these are in course of publication by Dr B L Della Vida of my laboratory staff

In routine treatment it is found that for the first year after the return of the blood picture to normal it is desirable to examine the blood every two or three months Thereafter the requirement of liver extract becomes stabilised and half-yearly or annual examinations suffice

Pathological Laboratories
Royal Hospital, Wolverhampton

S C DYKE

WAR-TIME NURSERIES

SIR,—The report of the Women's Parliament (*Lancet*, Jan 24, p 120) was interesting, but like other conferences on war-time nurseries this one lacked a sense of reality Let us look at the facts which determine what we *can* do in the way of war-time nurseries , and do not let us forget that the welfare of the children can be disregarded only at a price we should not be prepared to pay—a serious deterioration in physical and mental well-being

In peace time the soundest reason for the establishment of day nurseries and nursery schools is that children should benefit from the orderly routine, rest, nourishing food and opportunities for healthy development available in well run and adequately staffed centres In war-time two other reasons operate women (especially those receiving service allowances) are forced by lack of means to take up work , and more women are needed in industry In our opinion the first is an injustice which should be remedied by adequate allowances for children The second is powerful, but would more nurseries in actual fact release an enormous number of efficient women for industry ?

The Ministry of Health circulars on war-time nurseries stipulate that non-domestic staffing should be in the proportion of 1 woman to every 5 children, and in addition at least 2 domestic staff are required for a nursery of 40 children A nursery of 40 children will release therefore 25 women for industry, if one is prepared to admit 2 children from one family in 25% of cases admitted But these women still have the cares of the family upon their shoulders no matter what hours the children remain in the nursery Their efficiency can never be 100% and their absentee rate tends to be high To ensure that all the mothers with children under 5 in greater London alone should go into industry, nearly 30,000 full-time workers would be required to deal with their children In addition the manual labour employed in adapting equipping and maintaining premises must not be overlooked in assessing the gains to labour that these centres may provide Is it not possible that the women employed in war-time nurseries would be more economically used in industry, the mothers being left to look after their own children ? There is also a serious danger (due to a feeling that any nursery is better than none) that day nurseries with inadequately trained staff may be established We are both in favour of day nurseries and nursery schools but the value of these depends upon properly trained staff, of which there is already a serious shortage We note with surprise that the Ministry of Health will accept a matron who has had no experience in dealing with healthy children and no training in understanding their mental development , and with dismay that a trained nursery school teacher may serve several nurseries, with a warden to take her place in individual nurseries and that the warden's training may consist of only two weeks' instruction If nurseries staffed on these lines are set up in any number the result will be an increase in attendance at child-guidance clinics and in the sickness-rate of children and staff Those of us who have much to do with school-children are already perturbed by the effect upon them of mothers being at work Uncleanliness, lousiness, indiscipline, and petty misdemeanours are already on the increase , and all the communal meals, breakfasts dinners and teas cannot make up for lack of home care *Somebody* must look after children

Surely there are other ways of getting the labour so urgently required If unnecessary and delaying red tape procedures were eliminated could every Government department and local authority honestly claim that all their staffs would be fully employed ? Cannot large stores, where girls stand about for three-quarters of the week with too little to do, organise a rota for part-time work and have full staff only on the one or two busy days of the week ? Could not the people in residential hotels do more work for themselves ? Women in full-time Civil Defence Services would be glad to be employed in constructive work during some of their unoccupied time while things are quiet It may be that the Ministry of Health are of the same opinion as ourselves, since most local authorities who have been trying since May 1941, to obtain approval from the Ministry for schemes for day nurseries are impressed by the variety of delaying tactics which are adopted by the central authority , and it is a little ironical to read a joint letter from the Minister of Labour, the Minister of Health and the President of the Board of Education to the lord mayors and mayors of large industrial areas asking for their personal interest in providing more day nurseries for war workers' children

Mass production of war-time nurseries may result in serious damage to the health and proper development of young children, because a day nursery, unless well staffed, is a menace Moreover it is a clumsy and uneconomic makeshift for proper planning and re-organisation in the industrial world Before we sacrifice the ground which has been gained in health and well-being over the last 30 years by improved maternal care, let us consider possible alternative methods of recruiting women for war-time industry

MARY L GILCHRIST,
MATHILDA F MENZIES

THE DYSPEPTIC SOLDIER

SIR,—The article of Colonel Brockbank (Jan 10) and the commentary of Mr Maingot (Jan 24) bring out the Army's opinion of the treatment of peptic ulcer—something we know and would be willing to leave parked in the subconscious But it is out and this is Mr Maingot saying it

> "Now the Army is discharging a large number of patients suffering from proved—and sometimes unproved—peptic ulcer No special centres have been set up it seems for dealing specially with these cases nor have any means been devised for tackling a problem of vital national importance"

A hasty survey shows me that in days of peace we read—or there were written for our reading—some 125 articles a year on medical and surgical treatment of peptic ulcer In most there was a statistical summary of results remarkably alike I quote "the cures constitute approximately 75% of the total number of cases" In the hard trial of war the Army with knowledge born of experience, will have none of the 75% who should turn back and glorify the medical profession Army orders weed them out, long short and tall Colonel

U S Army as its first base hospital The weather was severe on the opening day but when Sir Farquhar Buzzard proposed the principal toast at the lunch and Professor Wilson replied there was ample reason to foresee a cultural as well as a scientific fellowship between the two countries represented

Obituary

PERCY KIDD

M D OXFD, F R C P

By the death of Percy Kidd our profession has lost not only an eminent clinician but also a great gentleman "P K" (as he was always called) was a physician of the Victorian age—a careful clinical observer specially skilled in the use of the stethoscope and gifted with sound common sense and judgment His bedside teaching was valued by his students for its insistence upon the importance of physical signs although a certain natural diffidence made him less successful in the lecture room He wrote little and chiefly on diseases of the chest, but he never wrote unless he had something to say His handsome well-cut features—and his equally well-cut clothes—his active and upright figure, and his charming and invariable courtesy were notable in any gathering, but an essential modesty made him backward in expressing his opinion in committee, although when he did so he was sure to be on the side of the angels Himself a man of the highest principles he had no patience with anything mean or mercenary, or which offended his rigid sense of professional honour, and when confronted with such he could show real anger

Elliott & Fry

"P K" had many interests outside medicine Up to an advanced age he rarely missed a fortnight's spring salmon fishing in Scotland and he was a keen golfer and a musician of considerable technical ability The last years of his long life were clouded by increasing failure of mental and physical powers, and by the death of his devoted wife So there is really nothing for tears in his passing, the last summons must have come to him as a release

R H

Percy Marmaduke Kidd was born in 1851, second son of Dr Joseph Kidd, who (himself the seventeenth of 18 children) dedicated five of his 15 children—Percy, Walter, Leonard, Frank and Mary—to the profession of medicine He was educated at Uppingham, where he was athletic champion, and Balliol College, Oxford, where he was Radcliffe travelling fellow, qualifying from St Bartholomew's Hospital in 1878 There he was house-physician to Samuel Gee, medical tutor and casualty physician, until after getting on the staff of the Brompton and City of London Hospitals he was in 1890 appointed assistant physician and pathologist to the London Hospital, later becoming lecturer on the principles and practice of medicine The Royal College of Physicians elected him fellow in 1885, councillor in 1903, censor in 1911, and Harveian orator in 1918 The oration was remarkable in its insistence on the need for better understanding of the pathology of *tuberculous infection* Recalling Thomas Willis and Richard Morton he ended with the cry of the disillusioned prophet, "I am not better than my fathers" Some idea of his own intense interest in the problems of seed and soil may be gained from the following selection from his published writings

(1875) Spontaneous Movements of Nucleoli *Quart J micr Sci* (1877) Early Development of the Hen's Egg *Ibid* (1878) A Contribution to the Pathology of Hæmophilia *Med chir Trans* (1883) Diphtheritic Paralysis *Ibid* (1884) Unusual Case of Pulmonary Aneurysm *Trans path Soc Lond* (1885) Fatal Hæmoptysis from Hydatid of the Lung *Ibid* (1886) Basic Tuberculous Phthisis *Lancet* (1888) Phthisis Pulmonalis *Allbutt's Syst of Med* (1895) Diseases of the Sputum *Quain's Dict of Med* (1910) Clinical History Respiratory System *Bain's Dict of Med* (1912) Some Moot Points in the Pathological and Clinical History of Pneumonia *Lumleian Lect R C P* (1918) Doctrine of Consumption *Harveian Oration*

Dr Kidd married in 1881 Gertrude daughter of Major-General T B Harrison, and they had three sons She predeceased him in 1940

ARCHIBALD KERR CHALMERS

M D, LL D GLASG, F R F P S G, T D

Dr A K Chalmers who died on Jan 24 in his eighty-sixth year, was for nearly 33 years medical officer of health for the City of Glasgow retiring in 1925 Born at Greenock in 1856 he was educated at Glasgow University, where he qualified M B with high commendation in 1879 For the next few years he was resident at the fever hospitals for the city and the joint authorities (at Maryhill) taking the D P H Camb in 1889 Two years later he entered upon his public health career when he was appointed colleague to James Burn Russell, and in 1898 succeeded him as M O H Chalmers's tenure coincided with the transition between the more purely environmental services and the personal services on which modern public health is founded At the same time he never lost sight of the fact that improved environment lay at the root of a sound health organisation, and housing reform in particular was one of the paramount aims of his administration, indeed, his studies of housing in relation to health were widely quoted and used as illustrations to point the way to modern housing and town-planning legislation His pioneer work on defects in school-children also paved the way for legislation His attitude to these and other public health problems was that of the investigator, and his writings were notable for combining the results of his inquiries with practical administrative ideals, although advance was slow and not at all proportionate to his enthusiastic advocacy But he saw in his lifetime the conversion of rickets from a disease causing obvious bony deformity to a deficiency disease which could be avoided by healthy nutrition

Elliott & Fry

Like many others who served him in the public-health department, writes A S M M, I consider myself fortunate in the association with a man who set the highest standards for himself and his staff His reports were accurate, clear and convincing His long experience had furnished him with a wealth of knowledge, always freely placed at the disposal of his colleagues, so that it was a delight to discuss with him the day-to-day work of the department and to argue plans for the future I have rarely come into contact with a mind so richly endowed, so fertile in ideas, and it would take too long to recount all his administrative achievements He had to deal with a number of menaces to public health, such as bubonic plague, smallpox, typhus and other epidemics He laid the foundations of the maternity and child welfare service, the tuberculosis and V D schemes he clearly perceived the wide range of functions that infectious hospitals could serve, particularly in the treatment of pneumonia and in the simpler infections of childhood Part of his retirement he devoted to a survey of the progress of sanitary, preventive and housing measures in the city from 1818 to 1925, published in a volume entitled "The Health of Glasgow" In his early years he was an enthusiastic volunteer, holding the rank of surgeon-major to the 1st Lanark field artillery branch When the medical department was reorganised under the Territorial Forces, he became chief sanitary officer of the Lowland Division, with the rank of lieut-colonel, serving as such in the last war In addition to other distinctions, he was president in 1913 of the Society of Medical Officers of Health

Dr Chalmers married Margaret Jessie, daughter of Henry Stewart of Glasgow They had three sons, one of whom was killed in the last war

Medical News

University of Oxford

In a congregation held on Jan 22 the following degrees were conferred —

B M—H J Elverson P F Ormrod J P V Rigby Helen M D Fox, Joan P Moignard *R E M Coke Harvey

* In absence

University of Cambridge

On Jan 24 the following degrees were conferred .—

M Chir—C G Rob (by proxy)

M.B B Chir—G A Barclay D G Vulliamy W J M Beveridge J N Milnes J A Smith David Caddy W H Chase J J Landon C W F. McKean F E T Scott, G O Storey, E D Cullen J P Donnell, S E Large, [illegible] D Atwell, J H Tasker, Harry Butler E J S Evans Hugh McColl T N Fison and W H Scott-Easton (all by proxy), W H Tattersall and P G Jeffries (in person)

M B—Richard Cairns (by proxy)

Royal College of Physicians of London

At a comitia of the college held on Jan 29, with Sir Charles Wilson, the president, in the chair, Dr S A Henry was appointed to deliver the Milroy lecture in 1943 on the health of the factory worker in war time The president gave an account of his visit to America and of his conferences with the medical authorities in Washington, Ottawa and New York

The following candidates, having satisfied the censors board, were admitted to the membership —

John Apley M D Lond, flight lieutenant R.A F V R, R A J Asher, M B Lond James Carson M B St And R V Dent M B Camb, G R Fearnley M B Lond, Israel Gordon M D Edin, J McC Kilgour, M D Manitoba, captain R C A M C J W Magladery M D Toronto J M Malins M B Birm W H H Merivale M B Lond C M Miller M B Lond flying officer R A F V R., Margaret E Morgans L R C P Muriel L Newhouse M B Lond, R B Niven B M Oxfd, R D Scott M B Camb, Agnes H Wilkinson M B Birm

Licences to practise were granted to 279 candidates (242 men and 37 women) who have passed the final examination of the conjoint board and complied with the by-laws of the college The following are the names of the successful candidates —

Joyce M Ackland P H Ahrendfeldt, J A Ainslie R C P Aldridge Margaret B Allchin Joan M L Apted, T C R Archer Winifred N Backhouse C H J Baker Margaret E R Balfour, G M Barrett, A C Barthels D G B Bennett Harry Bentley, B A S Bhalla, John Birch J W Bishop, Victor Blackman S H Bockner R B Body V M Borrelli D E Bottrill Sheila A. Bowden, Irene J S Bramley J D Broadbent D H Brown, J K Brown, Dorothy B D Callander, Gordon Canti B S Cardell Joyce L Chamberlain C J Champ Lilian M Chant D J Charley A L M Christie, Ralph Citron A.S Clark T E Cleghorn N K. Contractor, P B Counsell H G Coupland C O Crawford, D H Crook, W G Cross Mary H Cutting I S Dalton W G Dangerfield N A Daniel P M Daniel, C St J Davies C M Davies Joyce A Davies, M E Davies, P T Davies Ethel L Deas J L D Silva Elizabeth S A de Wit D G Dixon A P Douglas Jones H D Doyle, J H Ebbetts D F Edmiston C O Edwards T A B Edwards F A O El Gabbani Otto Englander D T R Evans D R. Evans Henry Ezriel Peter Farr P J Fawkner Corbett, D P Finnegan A O Foster H M Forde Ronald Fothergill E H M Foxen Ferdinand Frank G C Franklin J E Gabb B F Gans J G Gant Harold Gavurin, A W Gibbons George Gimmack C J Glass Paul Goldscheider, A H Golledge W W Gooddy S E Gordon, D W. Gould Mary B Graham, R J D Gray Edward Greenwood E P Griffiths J E H Griffiths, Isidor Grossmann Maria E Grossmann H -O W Grosvenor, J A Guilfoyle Ladislav Haas, Edwin Haigh J P Haile M H Hall W S Hall W A Hamer M S Handley E A Hargreaves, Margaret Hargreaves J J Hayward V L Helm F G Herman H D G Hetherington Inez Hewitt William Hewitt I T T Higgins F E Hobbs Edmund Holland T D S Holliday C D Hopkins Leo Hornung Charles Howick Smith P E Hughesdon Aladar Jakobovits J G H James, J B Jayne, J T M C Jenkins J D Johnson I L Jones Benno Juhn A R Kagan Albert Kagwa K. G Kapoor S L Kaye Anna R Kemp T L Kennedy D H King Irene M V King Helen G Kirk Bertha Klempman, John Knowelden J A Knowles Benjamin Kohn Bernard Kustow M G Langdon D A Langley, J R. Lauder M A Laybourne Lorna E Lethbridge H B M Lewis Egon Lewit, F M Liebmann, N P W Littler, G H T Lloyd Julius Lowy B S Lush Vivien U Lutwyche L A McAfee W H McAleenan M K. McCarthy E A McDowell, H P E MacFarlane Monica K Mack R D MacLean A C McLeish D L T Macsherry P B Maling, J V Mandel H N Mansfield Pauline C Marshall V H Martindale P B Maxted, Israel Mazin Basil [illegible] A H Michael Phillips L F Miller J N Milnes A T Moorhouse I A U Morgan D S Morris V O L Morris T G S Murray W H Myers F W Nash R T Nicholas R.C E Norman E R Nurse Reginald Ogley Oscar Olbrich D S Orr B D Owen A C Parkinson H L Patney M B Paul J F Pelmore D V Phillips G H N Phillips W L F Pilsworth John Pinching N M F P Pitt W H P Pond P J Poels C E Powell G F Purves Kathleen M Rains R V Read Walter Recht Alun Rees D D L Rees, Edgar Rhoden W S Rhodes J P V Rigby, B W T. Ritchie J S Rix R R H Robertson L C Robson H M Rose Albert Roth R T Routledge S R Rubin, J L Russell R Schwinger J P Scrivener Benno Silbiger Satyendra Singh Mark Slade David Slovick J R Soddy J T Spare Helen S andley, P L Steele Perkins Julius Stein B I Stephens, Edna H Stern W J Stevens S D Stock, F G Stoddart, P H D Stone E W Street Olive Sutcliffe, W H Tattersall, D H Teasdale, D J Thomas, I J Thomas, J I Thomas Nora Thomas, T J Thomas, R E M Thompson P A Thorn C D Thornley, A B Tompkins, A C Turner, E G Turner, P S Tweedy E F Twiss J S Twist C R Veall Albert Venner P M Vicary, D A Vyrnwy-Jones R H Walker, P R Walsh Barbara H Ward, R H Welch T A Werner K W Wilkinson P E D S Wilkinson John Wilks J E Williams, Norman Williams J M Wilson M G Wilson, R R Wilson, Matilda Winternitz Myer Wohl Basil Wolman F E Woodthorpe, Marion E F Woollaston J H Zibli, F B Zwink

Diplomas were granted, jointly with the Royal College of Surgeons, to the following candidates —

D P H—G M Hobbin, Henry Lomas A J Moss-Blundel

D M R—R Rewcastle Forbes Bertram, C H Goldmann

Diplomas in anæsthetics were also granted to the candidates named in the report of the meeting of the Royal College of Surgeons in our issue of Dec 20, and in psychological medicine and in laryngology and otology to those named in our issue of Jan 17

Royal College of Obstetricians and Gynæcologists

At a meeting of the council of the college held on Jan. 31 with Prof W Fletcher Shaw, the president, in the chair the following were elected to the membership —

V H Barnett Berkhamsted, H H F Barns, London Mary A M Bigby London, A B Concanon, London, Mary D Daley, London M L Gaudin, R A F Canada L A Ledingham London K M MacKenzie Sheffield Eleanor M Mills, Manchester, Lilian M N Raftery London, Mary R Thompson Manchester

Dr David Spencer Foster R A F, was admitted to the membership in absentia

Medical Research Council of Ireland

The council has made the following awards during last half of 1941 —

Dr F J Geoghegan, whole time grant for one year to carry out an investigation at the National Maternity Hospital, Dublin, under the direction of Prof John McGrath (1) of the value of the Hogden pregnancy test and (2) of intracranial hæmorrhage in the new-born

Dr Einhert Kawerau part time grant for six months to undertake a survey in the department of biochemistry, Trinity College, Dublin under the direction of Prof W R. Fearon of the distribution of vitamin C in the Irish natural food products and emergency sources

Prof J Brontë Gatenby, D Sc Grant in-aid to carry out an investigation into the function of the acrosome in mammalian fertilisation

The following have had their grants renewed Mr P J Boyle M Sc, Dr Oliver FitzGerald Dr D K O'Donovan, Dr Ninian Falkiner, Prof Hans Sachs and Dr R A Q O'Meara

Tuberculosis Association

A meeting of this society will be held at 26, Portland Place, London, W 1, on Saturday, Feb 21 at 10 30 A.M when Dr G T Hebert, the president, will make a statement on the future policy of the association At 11 30 A.M there will be a discussion on the rehabilitation of the tuberculous with special reference to the Ministry of Labour s interim scheme for the training and resettlement of disabled people At 2 30 P M there will be an informal clinical meeting

Biochemical Society

A meeting of this society will be held at the British Post graduate Medical School, Ducane Road, London, W 12 on Friday Feb 13, at noon

Medical Casualties

Captain William Jenkins Low, L R.C P E., R A M C, has been posted as missing

P/T/Surgeon Lieutenant A. R Barrett, R.N V R, H M S *Stanley*, and T/Surgeon Lieutenant R Stewart, R N V R H M.S *Audacity*, have been posted as missing, presumed killed

Eugenics Society

The Galton anniversary luncheon of this society will be held at the Eccleston Hotel, London, S W 1, on Thursday Feb 17; at 1 P M. Lord Horder will take the chair and Prof J D Bernal, F R S, will speak on the need for a social sciences research council

Pharmaceutical Society of Great-Britain

Dr Philip Hamill will be unable to give his lecture to this society on Feb 11 Instead on Thursday, Feb 12, at 2 30 P M Sir Walter Langdon-Brown will speak on medicine, magic and reason (17 Bloomsbury Square, London, W C 1)

British Orthopædic Association

Mr J R Girdlestone of Oxford has been elected president of the association in succession to Prof T P MacMurray of Liverpool

Brockbank quotes the Army authorities' instructions to presidents of medical boards . " Cases exhibiting active gastroduodenal symptoms with proved organic lesions should be recommended to be discharged as permanently unfit for military service " Why should this be ? I see two explanations (1) the fault is written in the optimism of medical authors , (2) the fault is with the Army If (1) is true some censorship of our medical literature is overdue If (2) is true and (1) false what a field is open, what an opportunity being lost—opportunity for Army gastro-enterological clinics and hospitals, centres of health where 100 men cast out unfit from the ranks of fit men may be treated medically and surgically, sorted and re-graded into 75 fit men and 25 in the descending scale of fitness To a proportion of these 25 we would reluctantly have to pronounce the dread sentence " We recommend that you be discharged as permanently unfit for military service "

Harley Street, W 1 H C H BULL

SOMNAMBULISM

SIR,—Being interested in the incidence of sleep-walking, and having no figures available, we inquired for ourselves One hundred persons in South-East London were interviewed They were asked if they themselves had ever walked in their sleep , 3 had done so If married they were asked whether their marital partner and children had ever done so , if single whether siblings or parents had 406 more people were so covered and among these there were 21 somnambules (5%) It was ascertained that 20 additional close relations (e g uncles, siblings of married persons) had walked in sleep In 68 families there was no known somnambule 24 families had one each, 6 families had two each 1 family had three and 1 family had five Clearly there is much material for the study of the significance of somnambulism

ELI DAVIS,
MONIQUE HAYES,
BRIAN H KIRMAN

Greenwich, S E 10

REGISTRATION OF ASSISTANT NURSES

SIR,—The two letters of Miss Edwards, secretary of the Nursing Recruitment Centre (*Lancet*, Jan 3 and 31 pp 27 and 154) show the hazardous future of any nursing aspirant It appears that in some of the 700 approved training schools " excellent conditions " are offered to the nurses Were it prudent and possible in these times to carry out an investigation into the conditions in training schools the insignificance of the number to which the word " excellent " applies might be a surprise to many, perhaps to Miss Edwards herself There are in addition many institutions throughout the country staffed with 80 or 90% of untrained and untrainable nurses This is not to the credit of the General Nursing Council nor to that portion of the medical profession engaged in hospital work When, as Dr Esther Carling (*Lancet*, Jan 24, p 125) points out, these institutions may be financed by the Treasury and local government funds the discredit is even greater There is much that is wrong with nursing as a career today and in few training schools are the conditions likely to attract recruits With national registration there is bound to be an increase in nursing aspirants How many of these will take up nursing because they really wish to become nurses ? How many will enrol for nursing in simple preference to a less congenial and less romantic war job ? After the war there will be an increase in the number of young girls willing to train as nurses Now is the time to prepare and repair a very out-of-date structure

In no other walk of life where girls are employed is the discipline so absurdly strict and the privileges so few In the *Nursing Mirror* of Jan 17 are two letters of interest One, from a nurse, gives a description of hospital pettiness typical of most hospitals , and the other, from a matron, outlines a policy which obviously does not exist in the hospital to which the nurse in her letter makes reference What can be done to improve this very worthy profession ? Miss Edwards supports one essential improvement Let there be a register of assistant nurses in which are those uncertificated " nurses " whose authentic nursing experience conforms to an adopted standard Non-training schools and nursing-homes would then employ state registered nurses with a percentage of registered assistant nurses In a training school the staff must consist of fully qualified matron, assistant matron sister tutor ward sisters, staff nurses, and probationer nurses undergoing training It is important that the senior staff should possess the necessary certificates covering the work of the hospital thus a matron, appointed to an isolation hospital which also admitted tuberculosis, should be in possession of fever and tuberculosis certificates The pay of probationer nurses should be no more than is required to meet reasonable expenses during her training There should, however be a substantial increase of salary on certification In other words better pay for the state-registered nurse These rates of pay should be standardised throughout the country and an end put to the competitive bidding for hospital staff exhibited in current nursing journals The improvement of hospital conditions is a task for the nurses themselves and the General Nursing Council to tackle without further delay

Manchester R SYDNEY DAVIDSON

SCIATIC PAIN

SIR,—I beg leave to correct a statement attributed to me in your columns in the report (p 141) of a recent discussion at the Royal Society of Medicine on sciatic pain I am alleged to have said that I would not advise operation for a prolapsed intervertebral disc in any case and that the results of surgical intervention had been deplorably unsuccessful I should not like it to be thought that these were my opinions I am convinced that operation for this condition has a useful, at times an essential, place in treatment , that we owe a considerable debt to those who first introduced it , and that we shall be still more indebted to the surgeons when we and they together are better able to judge in relation to the whole circumstances of a given case whether operation is preferable to more conservative methods of treatment Such improvement in our judgment can be achieved only, as Mr Pennybacker suggests, by a careful follow-up of patients treated by the two methods

What I did say in the course of the discussion which you report was that my experience with Service patients up to date had been that operation had been deplorably unsuccessful in getting them back to duty I had in mind a number of such cases in which I myself had advised operation and had subsequent reason to deplore that advice It may be that others have seen better results in Service cases and if this be so I hope that we shall hear from them On the other hand it may be that there is a difference between the results of operation in civilian and service patients because the latter have to return within a limited period to duties which are apt to cause recurrence of symptoms So far as my own experience goes I had hoped from the favourable accounts given by Dr J G Love and others that the operation might provide a short cut for the return to full duty of valuable Service personnel, but the results which I have seen have on the whole been so disappointing that I now advise it only in exceptional cases

Oxford C P SYMONDS

POSTURE DURING SLEEP

SIR,—I have just come across the following passage in Adler's " Problems of Neurosis " (p 152) which represents a point of view as yet unmentioned in this discussion

" When we see a person sleeping upon the back, stretched out like a soldier at attention, it is a sign that he wishes to appear as great as possible One who lies curled up like a hedgehog with the sheet drawn over his head is not likely to be a striving or courageous character but is probably cowardly A person who sleeps on his stomach betrays stubbornness and negativity "

Surrey County Sanatorium, Milford JOAH BATES

" Neurosis simulating *Organic* Disorder " should have been the title of Dr Dillon's letter last week

---

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export

ORIGINAL ARTICLES

VITAL STATISTICS OF THE SECOND YEAR OF THE WAR

PERCY STOCKS, M D CAMB , D P H
MEDICAL STATISTICAL OFFICER GENERAL REGISTER OFFICE

THE publication of the Registrar-General's Quarterly Return for the third quarter of 1941 makes it possible to examine the trend of birth- and death-rates in England and Wales during the first two years of the war Although there have been extensive movements of population during the war, and progressive changes in its age-constitution, the average total population has not changed sufficiently to invalidate the provisional use of the mid-1939 estimate as basis for the war-time rates The National Register of 1939 was taken into account in calculating the mid-year estimate All local rates in war-time must necessarily be based on civilian populations and deaths of civilians, but for national rates we can choose between civilian and total rates, the latter being confined of course to deaths registered in England and Wales and based on the estimated average number of persons, whether civilians or not, actually living in the country at a given moment A civilian death-rate tells us what proportion died amongst a residual population from which a large section of the healthy young adults had been taken away , during a war it must be expected to rise as more and more of these young people of low death expectation are transferred to the Services, and consequently it is difficult to evaluate the health significance of the trend of such an index The total death-rate suffers to a much slighter extent, if indeed it suffers at all, from this disadvantage, since the healthy young persons removed from its scope are limited to the migratory balance of losses over gains in this section of the population compared with the position in times of peace In the present war there have been compensatory movements of such kind and extent that this source of error has not yet been considerable Provided, therefore, that allowance can be made for deaths due to violent causes, the total death-rates as given in the Quarterly Returns of 1941 together with the infant-mortality rates furnish a tolerably good index of the health position in general

The Quarterly Returns for each quarter of 1941 have contained a new table giving for each sex separately the total deaths registered in successive quarters since 1938 from 36 different causes selected as being of special interest in time of war The return for the third quarter of 1941 gives these in each quarter from 1939 to mid-1941, and corresponding figures for each quarter of 1938 were given in the return for the first quarter of 1941. From the beginning of 1940 two important changes were made in the classification of deaths by cause—(1) the new International List of Causes of Death, as revised in 1938 by a conference at Paris, was substituted for the previous revision which was in force during 1931–39 , and (2) the new system of selection where more than one cause is mentioned on the death certificate came into force, this being now based on the order of preference stated by the physician rather than on fixed rules of precedence [1] In the appendix table of separate causes now being published in the Quarterly Returns the deaths in 1938 and 1939 have been corrected for the effect of both these changes, and represent the numbers which would have been classified to the cause in question under the present system Bearing this in mind, and the fact that the change in total population since 1938 has been slight, the deaths as they stand provide a sufficiently accurate index of the war-time trend of the 36 causes, without need for any statistical manipulations or corrections other than a slight allowance in the case of certain diseases for the progressive change in age constitution of the population It is hoped that this record may be continued quarter by quarter, with substitution, if and when the need arises, of other causes of special current interest for those of lesser importance

Since the Quarterly Returns are not easily accessible to many doctors who are interested in the war-time behaviour of particular diseases or of the national death-rates generally, it was thought that a summary of the main facts would be helpful in removing some misconceptions and in calling attention to the danger points in the health position For fuller details reference can be made to the Quarterly Returns for 1941

LIVE AND STILLBIRTHS

Quarter	Total births, live and still (hundreds registered)				Stillbirths per 1000 of total		
	1938	1939	1940	1941	1939	1940	1941
1st	1614	1597	1606	1526	39	39	37
2nd	1708	1707	1727	1527	37	35	36
3rd	1642	1670	1545	1524	36	35	33
4th	1496	1463	1420		39	36	

—	Live birth rates per 1000 population				Per cent change in livebirths compared with 1939	
	1938	1939	1940*	1941*	1940	1941
1st	15 3	15 0	15 0	14 4	+ 0 6	− 4 1
2nd	16 0	15 9	16 2	14 2	+ 1 4	− 10 4
3rd	15 2	15 4	14 3	14 1	− 7 4	− 8 5
4th	13 8	13 5	13 1		− 2 7	

The third quarter of 1940 recorded a sudden drop in the birth-rate, indicative of a fall in conceptions during the first few months of the war or alternatively an increase in abortions of which we have no evidence In the next two quarters the loss of births was less pronounced but in the second quarter of 1941 it exceeded 10% and in the third quarter amounted to 8½% A considerable fall in the number of conceptions probably occurred, therefore, in that period of 1940 when the country was faced with grave danger, notwithstanding the return of large numbers of men from abroad at that time A rise in abortion deaths in the first half of 1941 suggests however, that an unduly large proportion of conceptions may be terminating in abortion The risk of stillbirth has declined during the war, an unexpected happening linked also with the improving rate of maternal mortality

DEATH-RATES AND INFANT MORTALITY

Quarter	Infant-mortality rates per 1000 live births				Death-rates per 1000 living (all causes)			
	1938	1939	1940	1941	1938	1939	1940*	1941*
1st	68	65	77	75	13 6	15 1	19 9	17 5
2nd	49	48	46	59	11 6	11 7	11 6	13 5
3rd	42	40	43	43	9 9	9 9	10 7	9 7
4th	52	48	57		11 5	11 6	13 9	

* Provisional rates based on mid-1939 population

The deduction of casualties directly caused by operations of war would not affect the infant-mortality rates in the table up to the middle of 1940 , in the third and fourth quarters of 1940 and first and second quarters of 1941 the rates would be reduced by 1 unit in each instance , the rate for the third quarter of 1941 would be unchanged Comparing with the four quarters immediately preceding the war, the war-time change in infant mortality not directly due to aerial bombardment was, therefore, in the first four quarters of the war − 4, + 12, − 2, + 2, and in the next four quarters + 4, + 9, + 10 + 3 , that is to say, in the first four quarters there was an average rise of 2 and in the second four quarters an average rise of 6½ in the rate per 1000 live births

From the health standpoint the death-rates from all causes in time of war are, by themselves, of limited value as indices, and the rates from all non-violent causes, given below, provide a better indication of the war-time trend of fatal disease

---

[1] See Manual of the International List of Causes of Death as adapted for use in England and Wales and Northern Ireland, 1940, pp 36-41.

Notes, Comments and Abstracts

MEDICAL FILMS

AN audience of between three and four hundred attended the joint meeting of the London Scientific Film Society and the Socialist Medical Association on Jan. 31, when a programme of medical films was shown at the Imperial Institute. The first was the comparatively well-known nutrition film *Enough to Eat*, directed by Edgar Anstey with Julian Huxley as commentator. Though made in 1935, this film is not out of date, in spite of the quantities of first-class protein and other delicacies, such as the extinct banana, which provoked incredulous laughter. Malnutrition is commoner in war-time, and the problem is no longer purely economic but one of distribution of available foodstuffs to those who need them most—whether to increase production or to preserve health. The present inequitable distribution of food—for example, fish (a lot of which still goes to the better restaurants)—and other anomalies like bogus wholemeal bread and the black markets must be ousted in favour of increased canteen facilities in industry, more British restaurants, and fair distribution of essential foods.

Defeat Diphtheria, produced by Paul Rotha for the Ministry of Information, is a good example of an instructional film designed to improve public health. It gives an outline of the subject, shows the simple technique of immunisation and Schick testing and encourages parents to bring their children for treatment. It has been shown with success in rural communities, and the commentary by John Hilton is almost too persuasive. A complete antithesis was *Tell Me if it Hurts*. Instead of building up the kind and clever doctor, it satirises the dentist's drill and the mental tortures of the dentally damned. If conservative dentistry is to increase it should not be shown to children or lay audiences without an "E" Certificate (suitable for exhibition to the edentulous). Made by a doctor about a visit to the dentist, it seems to each member of the audience like an agonised page from his own past. Perhaps a dentist will one day return the compliment with an equally penetrating study of a visit to the doctor.

Blood Transfusion, another by Paul Rotha for the Ministry of Information, outlines history, theory and practice, with special reference to war-time conditions; it is notable for some historical reconstructions, particularly of advanced work on cadaver blood carried out in the U.S.S.R. The film also shows scenes recently taken of Karl Landsteiner at work in the United States, and of the blood-transfusion service in the Spanish Civil War. Present day blood storage and processing is carried out on such a scale that in places this film looks like a tour of a United Dairies bottling plant.

Plastic Surgery in War-time, produced by the Realist Film Unit, shows results achieved in a plastic and maxillofacial unit, but without demonstrating surgical technique. This is disappointing since a more detailed exposition would be a guide and warning to those who first deal with casualties. They might then save from amputation bits and pieces which the skilled plastic surgeon could later use to advantage when reconstructing features and limbs; heroic excision of the wound may remove much valuable scaffolding of the kind. Sir Harold Gillies, in a technicoloured commentary, describes the injury each patient received and the treatment he has given or proposes to give; each patient then describes how he came by his injuries. The recital leaves auditors with a healthy respect for windows, steam pipes and other structures which may prove disfiguring if raids are resumed; now that most surface shelters have been reinforced, it seems probable that these are safer from the secondary hazards of bombing than most ordinary buildings. Rehabilitation of disfigured patients is not only a surgical problem; it was impressive to see how readily these described their experiences, and the balanced courage with which they looked into the future.

Colonel G. W. Heron, M.R.C.S., director of medical services, has been appointed an official member of the executive council of Palestine.

The National Health Insurance division of the department of Health for Scotland has been moved from St. Andrew's House, Edinburgh, to 11, Great Stuart Street, Edinburgh, 3.

ON CHEMOTHERAPY

IT is a pity that no publisher has thought it worth while to start a medical series on the Penguin Special plan, or better still one which allowed expansion up to a monograph at half a crown and shrinkage down to a booklet at threepence. There are a lot of lectures and articles which reach a more or less large public when published in a journal and could also count on a wide welcome if they were then put on sale in a more handy form. The Dr. Mann lectures on chemotherapy, by Mr. G. S. Whitby, D.Sc., director of the Chemical Research Laboratory at Teddington, are a good example. These were delivered to the Royal Society of Arts on April 28 and May 5, 1941, and they are published in the society's *Journal* for Oct. 17, but however generous Dr. Whitby is with his reprints his lectures will not reach a tenth of the doctors who would find them interesting reading and would like to have them handy for reference. Whitby does not deal with the sulphonamides as comprehensively as, for instance, D. G. Ardley has done in our own columns, but he interprets the word "chemotherapy" broadly, and in his first lecture explains the development of the drugs for protozoal diseases, the arsenicals, the amidines, quinine substitutes, and prostigmine. Then in his second he begins with prontosil, and traces the synthesis of its derivatives and their use in clinical medicine and the treatment of wounds, and ends with a section on stilbœstrol and synthetic vitamin K.

Infectious Disease in England and Wales

WEEK ENDED JAN. 24

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1076; whooping-cough, 1512; diphtheria, 905; paratyphoid, 9; typhoid, 9; measles (excluding rubella), 969; pneumonia (primary or influenzal), 1158; puerperal pyrexia, 145; cerebrospinal fever, 136; poliomyelitis, 7; polio-encephalitis, 2; encephalitis lethargica, 3; dysentery, 103; ophthalmia neonatorum, 83. No case of cholera, plague or typhus fever was notified during the week.

The number of civilian and service sick in the Infectious Hospitals of the London County Council on Jan. 21 was 1274, including: scarlet fever, 131; diphtheria, 232; measles, 36; whooping cough, 510; enteritis, 51; chicken pox, 45; erysipelas, 23; mumps, 30; poliomyelitis, 1; dysentery, 18; cerebrospinal fever, 22; puerperal sepsis, 13; enteric fevers, 4; german measles, 1; glandular fever, 1; other diseases (non infectious), 61; not yet diagnosed, 95.

Deaths.—In 126 great towns there were no deaths from enteric fevers, scarlet fever or measles, 10 (2) from whooping-cough, 31 (2) from diphtheria, 42 (9) from diarrhœa and enteritis under 2 years, and 74 (10) from influenza. The figures in parentheses are those for London itself.

Deaths from influenza were scattered over thirty six great towns, Birmingham reporting 9 and Manchester 7, no other town more than 3. There were 3 fatal cases of diphtheria at Liverpool.

The number of stillbirths notified during the week was 190 (corresponding to a rate of 41 per thousand total births), including 14 in London.

Births, Marriages and Deaths

BIRTHS

IRVINE.—On Jan. 31, in London, the wife of Surgeon Lieutenant Gerard Irvine, R.N.—a son.

MOORE.—On Jan. 26, at Moseley, Birmingham, the wife of Major L. H. G. Moore, R.A.M.C.—a son.

TAYLOR.—On Jan. 25, at Sidcup, the wife of Lieutenant W. J. Taylor, R.A.M.C.—a daughter.

TEMPLE.—On Jan. 27, at Edinburgh, the wife of Surgeon Lieutenant J. Ll. Temple, R.N.V.R.—a daughter.

MARRIAGES

THOMPSON—MARSH.—On Jan. 24, at Wordsley, near Stourbridge, James Wesley Thompson, M.B., lieutenant R.A.M.C., to Brenda Dorothea Marsh.

TOWNSEND—HOWARD.—On Jan. 24, in Ceylon, Raymond Franci Townsend, M.R.C.S., surgeon lieutenant, R.N.V.R., to Lorna Fitzalan Howard.

DEATHS

DARLEY.—On Feb. 1, at Glenariff House, West Haddon, Rugby, Alfred Russell Darley, M.D. DUBL.

GODDARD.—On Jan. 31, at Woodstock, Marine Drive, Rottingdean, Charles Ernest Goddard, O.B.E., M.D. DURH., aged 82.

HATHAWAY.—On Jan. 28, at Windsor, Frank John Hathaway, M.D. EDIN., aged 65.

MATERNAL DEATHS, INJURY AT BIRTH, PREMATURITY

—	Half year	Deaths		
		1938–39	1939–40	1940–41
Diseases of pregnancy and childbirth (except abortion)	July–Dec. Jan.–June	824 828	815 736	635 694
Injury at birth (infants under 1 yr)	July–Dec Jan.–June	824 871	799 900	720 748
Prematurity (infants under 1 yr)	July–Dec Jan –June	4204 5035	4144 4823	3775 4561

Remembering that live births were about 6½% less in the second twelve months of the war, the deaths of infants from injury at birth fell by 13% and from prematurity by 10%, while maternal deaths declined by 20%, a noteworthy improvement

OTHER NON-VIOLENT CAUSES OF DEATH

Among other causes of death, the following have shown noteworthy increases since the beginning of the war · paratyphoid fever, dysentery, diarrhœa and enteritis, schizophrenia, epilepsy, pleurisy, hernia, congenital hydrocephalus and pyloric stenosis (males), cancer of various sites diseases of the prostate and rheumatoid arthritis (males) Suicides have declined, especially among women, the 1938–39, 1939–40 and 1940–41 totals being 3449, 3209, 3194 for males, and 1730 1674, 1463 for females

---

THE USE OF PLASMA IN A HOSPITAL SHIP

H R I WOLFE,
M B LOND , F R C S
SURGEON LIEUT -COMMANDER,
R.N V R.

H W. CLEGG,
M.B MANC , D P H.
SURGEON LIEUTENANT,
R.N V R.

THE administration of plasma and blood in ships presents difficulties which may lead to undue reliance being placed on morphia and intravenous saline for the treatment of shock. The essentially transient benefit of intravenous saline has been stressed by Hill, McMichael and Sharpey-Schafer (1940) The following is an account of the administration of plasma to 16 severely burnt patients in a hospital ship operating in the Middle East, and as a result of this experience we offer suggestions for its more widespread use at sea

Many of the casualties during an action will be due to burns, and if these can be treated for shock during transport to base lives should be saved Best and Solandt (1940) have shown that plasma and serum are physiologically and therapeutically identical, and the experiments of Buttle, Kekwick and Schweitzer (1940) and of Levinson, Neuwelt and Necheles (1940) bear testimony to the efficiency of plasma and serum as a blood substitute in acute hæmorrhage in the cat and dog Satisfactory results from plasma infusion have been reported by Brennan (1940) in cases of acute hæmorrhage in man and by Edwards, Kay and Davie (1940) in wound shock. For these reasons, and because it is easy to give, plasma commends itself for use in ships ; but the preparation which is best employed needs careful consideration We prefer dilute citrated plasma, the value of which is well established It can be easily prepared and supplied in one container ready after simple filtration to enter the patient Experience will probably prove that it can be stored at room temperature meanwhile we consider refrigeration, especially in tropical and subtropical climates, desirable Such facilities are always available in ships, and we have insisted on storage at 0°–4° C and recommended freezing solid if possible

PREPARATION OF THE PLASMA

The plasma was harvested from pooled blood collected into isotonic sodium citrate saline (Maizels and Whittaker 1940) in the proportion of 1500 c cm of blood to 500 c cm of diluent Sulphanilamide was added to give a final concentration of 1 in 1000 After standing at 1°–4° C the plasma was harvested as early as was compatible with a reasonable yield (usually in 4–5 days) Fat in the plasma was avoided by using fasting donors, and blood for Kahn test was taken from each The first donors were chosen from groups A and B in an endeavour to produce AB plasma but our supply of these men was soon exhausted and groups A and O now predominate The separated plasma was stored in 250 c cm. quantities, in glass bottles sealed with a sterile bung and cover ; it was raised to body temperature when required and filtered through sterile gauze before use Tests for sterility carried out on batch samples after freezing and storage for periods varying from days to months, and on any doubtful sample after thawing, have all been satisfactory

GENERAL MANAGEMENT OF BURNS

The burns, with one exception, were second degree, and it was their extent or associated injuries which made them serious Most of the patients were in hospital 14 hours after injury the others between 12 and 44 hours Burns treated with one of the jelly preparations, or with tannic acid and flavine, arrived in a better condition than those treated with moist dressings or tannic-acid compresses The patients were pale, sweating profusely and inclined to be apathetic The majority had mild local œdema and in one it was very severe The pulse was rapid and of poor quality. and the respiration-rate increased Thirst was invariable and its relief provoked retching and vomiting Spontaneous vomiting was noted twice The peripheral circulation was poor, and the superficial veins collapsed, dehydration and hæmoconcentration being such that in some patients blood could not be withdrawn through a fine needle from the internal saphenous vein at the ankle After plasma infusion improvement in the mental condition was notable, apathy giving way to alertness and an increased awareness of pain, often requiring morphia for its relief ; the quality of the pulse improved rapidly and thirst was ameliorated We are in full accord with the procedure proposed by Black (1940) for relating the administration of plasma to the patient's condition Hæmoglobin estimations can be carried out easily and rapidly, and the amount of plasma required estimated from data which he gives

All the burns except one third-degree case were treated by the tannic acid, silver nitrate technique (Bettman 1935), which is satisfactory if the skin has not been completely destroyed We have not seen the circulatory complications of the fingers or damage to the eyes or lids following tanning of the face mentioned by others Sepsis sometimes developed in skin flexures or at pressure points, but it responded well to cleaning, dehydrating and retanning, or the application of gauze wrung out in 1 in 1000 flavine Two patients failed to heal within a fortnight The one third-degree burn was treated during the first week by applying gauze wrung out in spirit which was left undisturbed and later by saline baths and compresses applied over tulle gras The blood-volume was assessed by repeated hæmoglobin examinations and the fluid balance from charted intake and output Of the 16 patients, 4 (cases 1 2, 4 and 6) required repeated infusions to maintain blood-volume during the first 87 hours in hospital Charts showed a deficit if fluids were given only by mouth, and routine rectal saline was necessary, but this could as a rule be dispensed with by the third day Chemotherapy was reserved for established staphylococcal and streptococcal complications A high protein diet was given to all patients

Mortality —There were 7 deaths 4 patients (cases 5, 8, 9 and 11) were severely burned showed no response and died within 14 hours of admission Case 5 had intracranial damage, case 9 had poisoning from nitrous fumes, and the other 2 were much more ill than the degree of hæmoconcentration would indicate One patient (case 3), extensively burned, responded well to plasma but died 29 hours after admission He had stood operation well, the burns were covered by a dry firm eschar, the blood-picture was normal, and there were no symptoms of toxæmia The exact cause of death is not known, (post-mortem examination was often not practicable) Case 1, who was very extensively burned, responded well to plasma but on the fourth postoperative day developed symptoms of burn toxæmia and died 2 days

DEATH-RATES FROM ALL CAUSES OTHER THAN VIOLENCE †

Quarter	Per 1000 living					
	1936	1937	1938	1939	1940*	1941*
1st	14 6	15 6	13 0	14 5	19 2	15 9
2nd	11 2	11 0	11 1	11 1	11 0	11 6
3rd	9 2	9 1	9 4	9 3	9 3	8 9
4th	11 4	11 8	10 9	11 0	11 5	

* Provisional rates based on mid 1939 population

† Suicide, homicide, accidental causes including poisoning, operations of war

The rates for the first quarters of 1940 and 1941 were influenced by the severe winters, aggravated no doubt by war conditions, which hastened the death of many old people and persons suffering from chronic ailments The second quarter has for many years shown a remarkably steady rate, about 11 per 1000, but some increase in this rate occurred in 1941 which was distributed over a wide range of chronic diseases and was probably due to the effect of war strain in turning the scale between recovery and death for a certain proportion of sick persons No important rise has occurred in the rates for the third and fourth quarters , indeed the all-causes rate for the third quarter of 1941 was unusually low, this being a period in which the war tempo was considerably relieved in this country

TUBERCULOSIS

Quarter	Males			Females		
	1938–39	1939–40	1940–41	1938–39	1939–40	1940–41
RESPIRATORY TUBERCULOSIS DEATHS						
3rd	2662	2542	2665	2032	1934	2062
4th	2991	3091	3328	2163	2118	2283
1st	3780	4533	4226	2539	2974	2789
2nd	3291	3394	3849	2249	2421	2640
Total	12724	13560	14068	8983	9447	9774
DEATHS FROM OTHER FORMS OF TUBERCULOSIS						
3rd	503	492	539	456	426	496
4th	481	476	531	453	414	461
1st	625	596	731	492	552	606
2nd	635	715	778	520	594	758
Total	2244	2279	2579	1921	1986	2321

The figures for respiratory tuberculosis speak for themselves, and no amount of selective treatment of them, as in a *Times* leading article of Dec 29 last, can obscure the fact that a real increase in deaths from respiratory tuberculosis has occurred since the war began Comparing with the year from mid-1938 to mid-1939 as standard, the increase amounted to about 6% in the first year of war and 10% in the second year For other forms of tuberculosis the increase was later in appearing but was then proportionately greater than for the respiratory form

Again comparing with the year preceding mid-1939, the increase in deaths from other forms of tuberculosis amounted to 2 4% in the first year and 17 6% in the second year The bulk of the recent increase has been due to tuberculous meningitis , in the first half of 1940 deaths from this cause numbered 1047 but in the first half of 1941 the total was 1422, an increase of 375, while all other forms of non-respiratory tuberculosis showed a rise of only 41 Deaths from tuberculous meningitis of children under 10 years numbered 1001 in the whole of 1939, but in the first three-quarters of 1941 alone they numbered 1233

DEATHS FROM CEREBROSPINAL FEVER

Quarter	Males			Females		
	1938–39	1939–40	1940–41	1938–39	1939–40	1940–41
3rd	68	49	199	46	23	122
4th	61	76	269	30	41	168
1st	96	649	479	80	501	412
2nd	82	388	356	70	288	278

The deaths in the first half of 1941 were 84%, and the notifications 85%, of the totals reached in the first half of 1940 Fatality, as indicated by deaths per 100 notifications, was 38% in the first half of 1939 , for civilians it was 32, 22, 23, 21% in the four half-years which followed, and for non-civilians 21, 8, 8, 9%

OTHER INFECTIONS AND METABOLIC DISORDERS

—	Half year	Deaths (both sexes) at all ages		
		1938–39	1939–40	1940–41
Diphtheria	July–Dec	1238	990	1485
	Jan.–June	1142	995	1476
Whooping cough	July–Dec	336	385	396
	Jan –June	844	282	1555
Measles	July–Dec	140	117	565
	Jan –June	186	292	1042
Acute poliomyelitis and polioencephalitis	July–Dec	210	88	102
	Jan –June	55	59	66
Scarlet fever	July–Dec	112	81	71
	Jan –June	100	83	76
Erysipelas	July–Dec	114	79	92
	Jan –June	169	122	126
Ear and mastoid disease	July–Dec	531	475	472
	Jan –June	714	537	492
Appendicitis	July–Dec	1453	1344	1132
	Jan –June	1392	1333	1033
Influenza	July–Dec	1196	971	984
	Jan –June	7050	10498	6003
Pneumonia	July–Dec	9349	7480	9414
	Jan –June	15924	19781	17890
Bronchitis	July–Dec	9578	10107	11429
	Jan –June	21331	34852	25211
Rheumatic fever (acute)	July–Dec	457	414	341
	Jan –June	541	510	367
Diabetes mellitus	July–Dec	2258	2409	2343
	Jan –June	2752	3009	2775
Exophthalmic goitre	July–Dec	661	650	477
	Jan –June	730	709	527
Pernicious anæmia	July–Dec	885	917	945
	Jan –June	1005	1222	1354

Of the infectious diseases of childhood, diphtheria deaths increased considerably in the year commencing at mid-1940, as did whooping-cough deaths Measles also became epidemic again in many towns where this had been expected a year earlier The streptococcal and pyogenic infections have declined remarkably as causes of death during the war, despite less satisfactory conditions, a result probably due to sulphonamide therapy Pneumonia has failed to register any improvement despite the new therapy Bronchitis and pneumonia seem, however, to have been adversely affected to some extent by the conditions imposed by air-raids, and this has probably counteracted the beneficial effects which might otherwise have been seen in the statistics There has been a remarkable decline in deaths from rheumatic fever, although, as might have been expected, deaths from its late sequelæ have increased during the war Diabetes shows little change in the two years, nor in comparison with the years 1937 and 1938, when the annual deaths according to the new method of classification were 5106 and 4732 respectively Exophthalmic goitre deaths declined greatly in the second year of the war, but those from pernicious anæmia have increased

DEATHS FROM ULCER OF THE STOMACH AND DUODENUM

Half year	Males			Females		
	1938–39	1939–40	1940–41	1938–39	1939–40	1940–41
July–Dec	1814	1886	2262	500	526	654
Jan –June	2047	2263	2695	590	645	676

Deaths from peptic ulcer have increased considerably during the war, the increase in the second year being 28% for men and 22% for women

MATERNAL DEATHS, INJURY AT BIRTH, PREMATURITY

—	Half-year	Deaths		
		1938–39	1939–40	1940–41
Diseases of pregnancy and childbirth (except abortion)	July–Dec.	824	815	635
	Jan.–June	828	736	694
Injury at birth (infants under 1 yr)	July–Dec	824	799	720
	Jan.–June	871	900	748
Prematurity (infants under 1 yr)	July–Dec	4204	4144	3775
	Jan–June	5035	4823	4561

Remembering that live births were about 6½% less in the second twelve months of the war the deaths of infants from injury at birth fell by 13% and from prematurity by 10%, while maternal deaths declined by 20%, a noteworthy improvement

OTHER NON-VIOLENT CAUSES OF DEATH

Among other causes of death the following have shown noteworthy increases since the beginning of the war · paratyphoid fever, dysentery, diarrhœa and enteritis, schizophrenia, epilepsy, pleurisy hernia, congenital hydrocephalus and pyloric stenosis (males), cancer of various sites diseases of the prostate and rheumatoid arthritis (males) Suicides have declined, especially among women the 1938–39, 1939–40 and 1940–41 totals being 3449, 3209, 3194 for males, and 1730, 1674, 1463 for females

---

THE USE OF PLASMA IN A HOSPITAL SHIP

H R I WOLFE,
M.B LOND., F R C S
SURGEON LIEUT-COMMANDER
R.N V R.

H W CLEGG,
M.B MANC, D P.H
SURGEON LIEUTENANT,
R.N V.R

THE administration of plasma and blood in ships presents difficulties which may lead to undue reliance being placed on morphia and intravenous saline for the treatment of shock The essentially transient benefit of intravenous saline has been stressed by Hill, McMichael and Sharpey-Schafer (1940) The following is an account of the administration of plasma to 16 severely burnt patients in a hospital ship operating in the Middle East, and as a result of this experience we offer suggestions for its more widespread use at sea

Many of the casualties during an action will be due to burns, and if these can be treated for shock during transport to base lives should be saved Best and Solandt (1940) have shown that plasma and serum are physiologically and therapeutically identical, and the experiments of Buttle, Kekwick and Schweitzer (1940) and of Levinson, Neuwelt and Necheles (1940) bear testimony to the efficiency of plasma and serum as a blood substitute in acute hæmorrhage in the cat and dog Satisfactory results from plasma infusion have been reported by Brennan (1940) in cases of acute hæmorrhage in man and by Edwards, Kay and Davie (1940) in wound shock. For these reasons, and because it is easy to give, plasma commends itself for use in ships, but the preparation which is best employed needs careful consideration We prefer dilute citrated plasma, the value of which is well established It can be easily prepared and supplied in one container ready after simple filtration to enter the patient Experience will probably prove that it can be stored at room temperature, meanwhile we consider refrigeration, especially in tropical and subtropical climates, desirable Such facilities are always available in ships, and we have insisted on storage at 0°–4° C and recommended freezing solid if possible

PREPARATION OF THE PLASMA

The plasma was harvested from pooled blood collected into isotonic sodium citrate saline (Maizels and Whittaker 1940) in the proportion of 1500 c cm of blood to 500 c cm of diluent Sulphanilamide was added to give a final concentration of 1 in 1000 After standing at 1°–4° C the plasma was harvested as early as was compatible with a reasonable yield (usually in 4–5 days) Fat in the plasma was avoided by using fasting donors, and blood for Kahn test was taken from each The first donors were chosen from groups A and B in an endeavour to produce AB plasma but our supply of these men was soon exhausted and groups A and O now predominate The separated plasma was stored in 250 c cm quantities, in glass bottles sealed with a sterile bung and cover; it was raised to body temperature when required and filtered through sterile gauze before use Tests for sterility carried out on batch samples after freezing and storage for periods varying from days to months, and on any doubtful sample after thawing, have all been satisfactory

GENERAL MANAGEMENT OF BURNS

The burns, with one exception, were second degree, and it was their extent or associated injuries which made them serious Most of the patients were in hospital 14 hours after injury, the others between 12 and 44 hours Burns treated with one of the jelly preparations, or with tannic acid and flavine, arrived in a better condition than those treated with moist dressings or tannic-acid compresses The patients were pale, sweating profusely and inclined to be apathetic The majority had mild local œdema and in one it was very severe The pulse was rapid and of poor quality and the respiration-rate increased Thirst was invariable and its relief provoked retching and vomiting Spontaneous vomiting was noted twice The peripheral circulation was poor, and the superficial veins collapsed, dehydration and hæmoconcentration being such that in some patients blood could not be withdrawn through a fine needle from the internal saphenous vein at the ankle After plasma infusion improvement in the mental condition was notable, apathy giving way to alertness and an increased awareness of pain, often requiring morphia for its relief, the quality of the pulse improved rapidly and thirst was ameliorated We are in full accord with the procedure proposed by Black (1940) for relating the administration of plasma to the patient's condition Hæmoglobin estimations can be carried out easily and rapidly, and the amount of plasma required estimated from data which he gives

All the burns except one third-degree case were treated by the tannic acid silver nitrate technique (Bettman 1935) which is satisfactory if the skin has not been completely destroyed We have not seen the circulatory complications of the fingers or damage to the eyes or lids following tanning of the face mentioned by others Sepsis sometimes developed in skin flexures or at pressure points, but it responded well to cleaning, dehydrating and retanning, or the application of gauze wrung out in 1 in 1000 flavine Two patients failed to heal within a fortnight The one third-degree burn was treated during the first week by applying gauze wrung out in spirit which was left undisturbed and later by saline baths and compresses applied over tulle gras The blood-volume was assessed by repeated hæmoglobin examinations, and the fluid balance from charted intake and output Of the 16 patients, 4 (cases 1 2 4 and 6) required repeated infusions to maintain blood-volume during the first 87 hours in hospital Charts showed a deficit if fluids were given only by mouth, and routine rectal saline was necessary, but this could as a rule be dispensed with by the third day Chemotherapy was reserved for established staphylococcal and streptococcal complications A high protein diet was given to all patients

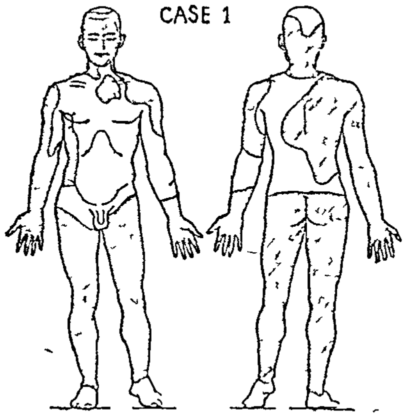
Mortality—There were 7 deaths 4 patients (cases 5, 8, 9 and 11) were severely burned showed no response and died within 14 hours of admission Case 5 had intracranial damage, case 9 had poisoning from nitrous fumes, and the other 2 were much more ill than the degree of hæmoconcentration would indicate One patient (case 3), extensively burned, responded well to plasma but died 29 hours after admission He had stood operation well, the burns were covered by a dry firm eschar, the blood-picture was normal, and there were no symptoms of toxæmia The exact cause of death is not known, (post-mortem examination was often not practicable) Case 1, who was very extensively burned, responded well to plasma but on the fourth postoperative day developed symptoms of burn toxæmia and died 2 days later of capillary bronchitis Case 12 developed a severe streptococcal tonsillitis and pharyngitis and died of massive obstructive atelectasis due to capillary bronchitis 8 days after admission

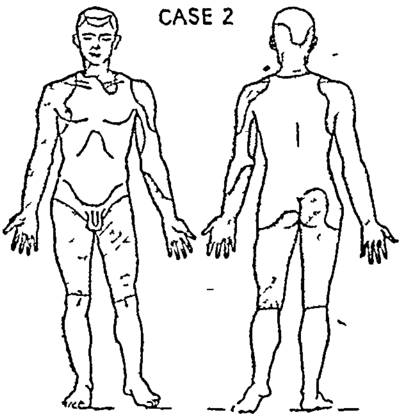
CASE-HISTORIES

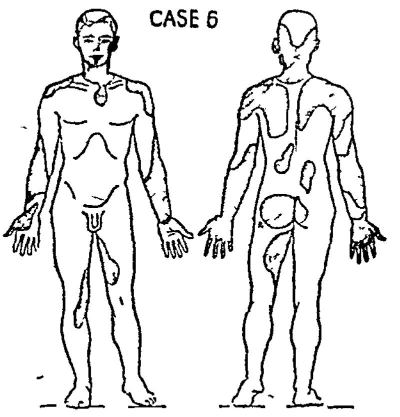
Case-records are arranged in order of degree of hæmoconcentration We realise the inadequacy of the reports on the patients that died soon after admission but they are included for completeness

CASE 1 —Admitted May 27, 8 P M , severely shocked and in a desperate condition, 12 hr after three quarters of the body had been burned At 9 30 P M , Hb 188% , given 2000 c cm plasma Condition improved, operation then undertaken 4 hr after admission May 28, 12 30 A M , Hb 118%, given 500 c cm plasma, 2 30 A M , given 500 c cm plasma , 3 A M , Hb 104% , 12 25 P M , Hb 120%, given 600 c cm plasma May 29, 11 A M , Hb 118%, given 850 c cm plasma , 4 P M , Hb 104% May 30, Hb 104% June 1, Hb 90%

Thus 2000 c cm plasma enabled operation to be undertaken After 4450 c cm in all, during 62 hr , the blood-concentration maintained a normal level and there was sustained improvement in the general condition for 36 hr Symptoms of burn toxæmia then developed and he died 6 days after admission from capillary bronchitis (autopsy) The burns on the back had broken down but elsewhere they were clean and dry


CASE 1


CASE 2


CASE 6

CASE 2 —Admitted May 27, severely shocked, 14 hr after half the body had been burned At 9 30 P M , Hb 162%, given 1500 c cm plasma, mild chill Condition improved, operation 5 hr after admission May 28, 2 A M , Hb 128%, given 500 c cm plasma , 3 A M , Hb 122%, given 500 c cm plasma , 12 noon, Hb 120%, given 600 c cm plasma May 29, 11 A M , Hb 120%, given 850 c cm plasma , 4 P M , Hb 110%, given 500 c cm plasma May 30, 12 30 P M , Hb 100% May 31, 12 noon, Hb 108%, given 1000 c cm glucose saline June 1, Hb 95% June 4, Hb 94%

After receiving 4450 c cm plasma during 48 hr and later 1000 c cm glucose saline there was steady progress Discharged after 16 days with wounds healed except the ulnar surface of the forearms and the webs of the fingers

CASE 3 —Severely shocked on admission 14 hr after burns of face, neck, forearms, hands, and legs between shorts and stockings Hb 140%, given 1450 c cm plasma Operation 6 hr after admission Hb 96% 9 hr after plasma Stood operation well but did not rally and died 29 hr after admission

CASE 4 —Admitted May 24, with moderate shock, 29 hr after burns of face, neck, both hands and both legs and having been 1½ hr in the water At 1 30 P M , Hb 122%, given 1000 c cm plasma which enabled operation to be undertaken 4 hr after admission At 5 30 P M , Hb 111%, given 500 c cm plasma At 9 P M , Hb 108%, given 500 c cm plasma May 26, 8 30 A M , Hb 107%, given 250 c cm plasma During next 9 days Hb readings were normal

A total of 2250 c cm plasma was given during 48 hr Convalescence was uneventful The burns healed perfectly Discharged after 19 days

CASE 5 —Admitted 44 hr after injury (had been unconscious for the first 33 hr) Severely shocked and slightly irrational, splinter wound of right frontal region and burns of face, neck, trunk and limbs Hb 120%, given 850 c cm plasma Died 6 hr after admission

CASE 6 —Admitted May 24, severely shocked and extremely œdematous, 25 hr after second and third-degree burns of about half the body and having been 2 hr in the water At 1 30 P M , Hb 118%, given 850 c cm plasma , 5 30 P M Hb 102%, given 500 c cm plasma Operation then undertaken, preceded by tracheotomy At 9 P M , Hb 100% The œdema soon lessened and there was steady general improvement On May 26, Hb 115%, given 750 c cm plasma During the next 14 days the Hb readings were not above 100% , 12 days after admission a blood transfusion of 1000 c cm was given because the third degree burns of the hands, ears, forehead and temporal regions broke down badly and were infected The tanned areas on the back, shoulders, arms and buttocks healed well Discharged after 5 weeks for skin grafting

CASE 7 —Admitted 14 hr after burns of the face, front of neck, right scapular region, outer surface of right arm and forearm and left antecubital fossa Hb 118%, given 850 c cm plasma Operation then undertaken , 12 hr later Hb 104%, given 250 c cm plasma Thereafter Hb readings were normal Recovery uneventful

CASE 8 —Admitted, severely shocked, 20 hr after extensive burns of the face, neck, trunk and limbs Hb 110%, given 450 c cm plasma Died 3 hr after admission

CASE 9 —Admitted, with mild shock, 14 hr after extensive burns and suffering from the effects of nitrous fumes Hb 110%, given 450 c cm plasma Died 14 hr after admission

CASE 10 —Admitted 14 hr after burns of part of face, both wrists, inner side of right arm and left scapular region Mild shock Hb 104%, given 250 c.cm plasma which reduced Hb to 96% Uneventful recovery

CASE 11 —Admitted 14 hr after extensive burns of face, neck, trunk and limbs Severe shock Hb 103%, given 250 c cm plasma Died 8 hr after admission

CASE 12 —Admitted 14 hr after burns of face, front of neck, right pectoral region, arms and scapular regions Mild shock Operated on 8 hr later and then given 500 c cm plasma Made good progress for 2 days Burns of back then began to break down Developed severe streptococcal tonsillitis and pharyngitis and died 8 days after admission Cause of death (autopsy), massive pulmonary atelectasis secondary to capillary bronchitis

CASE 13 —Admitted 14 hr after burns of face, neck, right arm and shoulder, left forearm, right buttock and thigh, and both scapular regions Mild shock Operation 5 hr later followed by 500 c cm plasma Recovery uneventful

CASE 14 —Admitted 20 hr after burns of face, neck, shoulders, back, left forearm and both hands During next 33 hr there was progressive hæmoconcentration and he was given 500 c cm plasma Recovery uneventful

CASE 15 —Burns of forearms, buttocks and right thigh Admitted 14 hr later Mild shock Hb readings increased from 90% to 102%, given 250 c cm plasma Operation 11 hr after admission with Hb 98% Recovery uneventful

CASE 16 —Admitted 14 hr after injury Perforated ear drums, burns of face, front of neck, forearms, half of right leg and thigh Operation 13 hr later followed by 250 c cm plasma Developed bilateral otitis media Burns healed perfectly

DISCUSSION

Although the mortality was high these men were severely injured and were not admitted until at least 12 hours had elapsed After plasma infusions 4 patients (case 5, 8, 9 and 11) injured 14–44 hours previously failed to respond 13 injured 12–29 hours previously showed considerable improvement and no patient died as a result of overloading the circulation

It is essential to estimate repeatedly the degree of hæmoconcentration after plasma has been given; with extensive burns loss of fluid continued and was rapid enough to reconcentrate the blood For example case 2, with Hb 162% required, according to calculation 1914 c cm of plasma; yet the blood did not remain normal until 4450 c cm. had been given over 3 days It is important to realise that plasma transfusion in burns usually needs to be continued for 36–48 hr because during this period plasma is still being lost into the burnt area

Pulse-rates remained high for some time after infusion, but the rapid improvement in quality was a valuable indication of recovery. Blood-pressures were not taken.

Though some of the plasma was 6 months old and much of it from group O donors we have never resorted to the 1 in 50 dilution test of Knott and Koerner (1939) There was only one reaction · case 2 had a mild rigor after receiving 1500 c cm of plasma This may have been due to the plasma, but the man's cot was exposed to a draught at the time

In secondary shock after burns there is a fall in blood-volume due to loss of plasma. The mechanism producing this loss, estimated at 3500 c cm in 12 hours after a burn of a sixth of the body-surface in a man of 10 stone (Mitchiner 1935) is complex, but increased capillary permeability (Moon 1939) and loss of serum from the burnt area contribute largely to it If plasma infusion was delayed or treatment of the burn postponed we noted that the local œdema progressed whereas after plasma had been given the œdema almost disappeared within 12 hours. Case 6 was an exception for there the œdema was so severe that tracheotomy was necessary, and though improvement was considerable after 12 hours the œdema did not disappear for 36 hours The volume of serum in unruptured vesicles the rapid accumulation of exudate on a raw surface while it is being cleaned and the difficulties of controlling hæmoconcentration until the eschar was dry indicated the large amount of fluid lost from the burnt surface In hot moist climates perspiration is an important factor Sweating was profuse on admission and troublesome during convalescence Profuse perspiration consequent on working in a hot moist atmosphere can lead to a loss of fluid which will provoke acute erythrocytosis (Wright 1937)

We have found that provided the burnt surface is sealed by coagulation plasma will restore to the circulation that fluid lost in the tissue spaces provided capillary damage is not irreparable, and the skin loss can be balanced by oral administration of fluid. supplemented if necessary by rectal and intravenous saline For this reason we feel some form of coagulant must be applied as a first-aid dressing if treatment is unavoidably delayed, and that although saline baths are of value when the patient's life is not threatened they have no place in the treatment of extensive superficial burns

SUMMARY AND CONCLUSIONS

Plasma has merits in the treatment of shock associated with burns The dilute citrated form has proved easy to prepare safe and efficient and seems at present to be the most useful in ships

Its use in 16 cases of severe burns is reported

Apart from one reaction. no ill effects followed infusions of even group O plasma in massive doses

We have no experience of plasma in the treatment of shock associated with acute hæmorrhage or wounds because whole blood has always been available and we do not suggest that plasma be substituted in hospital ships for this purpose But the issue of stored blood to fighting ships is impracticable, because without a steady supply of casualties it will be wasted, and transfusion of fresh blood, with its attendant difficulties of grouping matching and bleeding is rarely possible. Under such conditions we suggest the substitution of plasma.

After a naval action there is always a delay before the patient reaches hospital and these hours are vital to the type of casualty often encountered Citrated plasma is much more valuable than saline or glucose saline as an anti-shock agent and just as simple and safe in application. and an urgent plea is made for its adoption in ships *

We wish to thank Surgeon Captain M S Moore for permission to undertake the work, and Surgeon Commander T F. Crean, and Surgeon Commander J. Johnston for access to their cases For technical assistance we wish to thank Surgeon Commander (D) L R Armstrong, and the theatre and laboratory staffs

REFERENCES

Best, C H and Solandt D Y (1940) *Brit. med J.* ii, 116
Bettman A. G (1935) *Northw Med* 34 46
Black, D A. K. (1940) *Brit med J* ii, 693
Brennan H J (1940) *Ibid*, i, 1047
Buttle G A H, Kekwick, A and Schweitzer, A (1940) *Lancet*, ii, 507
Edwards F R. Kay J and Davie T. B (1940) *Brit med J* i 377.
Hill D K. McMichael, J and Sharpey-Schafer E P (1940) *Lancet* ii 774
Knott F A and Koerner E H (1939) *Ibid* ii 1069
Levinson, S O Neuwelt, F and Necheles H (1940) *J Amer med Ass.* 114 455
Maizels, M. and Whittaker N (1940) *Lancet* i 590
Mitchiner P H (1935) The Modern Treatment of Burns and Scalds London
Moon V H (1939) *Ann Surg* 110, 260
Wright, S (1937) Applied Physiology, London p 525

THE POUCH OF HARTMANN

FRANCIS DAVIES,
M.D, D.SC LOND, F.R.S.E
PROFESSOR OF ANATOMY,
UNIVERSITY OF SHEFFIELD

H E HARDING
D.M OXFD
LECTURER IN PATHOLOGY
IN THE UNIVERSITY

THERE seems to be a general opinion among surgeons that the structure known as Hartmann s pouch is a feature of the normal human gall-bladder A perusal of the literature and the examination of a number of gall-bladders removed post mortem have caused us to question this

Dorland (1940) defines this structure as 'a pouch at the exit of the gall-bladder into the cystic duct," and attributes its original description to Robert Hartmann (1831–1893), a German anatomist, professor at Halle We have been unable to trace any such description in the writings of this author, but Henri Hartmann (1891) of Paris described the pouch, and clearly indicated that Paul Broca originally drew attention to it, H Hartmann referred to it as "cette partie que Paul Broca avait justement denommee 'bassinet de la vésicule.'" Broca (1850) figured and described the pouch and proposed to give it the name of "bassinet de la vésicule biliaire"; he considered it to be a dilatation of the upper part of the cystic duct and noted valvular folds of the mucous membrane both above and below it Hartmann, however considered the pouch to occupy the region of the neck of the gall bladder, and he too described the valvular folds limiting it He described the pouch as occurring in the normal organ, but his illustrations are drawn from five calculous gall-bladders Later his assistant, Virenque (1923), in the anatomical section of Hartmann's book on the surgery of the biliary tract, made no reference to this pouch in describing the external configuration of the normal gall-bladder, but he described internally, in the region of junction of the neck and cystic duct, two valvules between which he found the "bassinet de Broca" He also observed that the gall-bladders described by Hartmann (1891) were all pathological

As far as we have been able to determine, modern textbooks of normal human anatomy do not describe "Hartmann's pouch" as a feature of the normal human gall-bladder, but it is either described or accepted as a normal structure in a number of textbooks of surgery, surgical anatomy and pathology On the other hand, many make no reference to it while others leave the reader in doubt whether it is regarded as normal or as resulting from impaction of a stone or from pathological dilatation of the gall-bladder

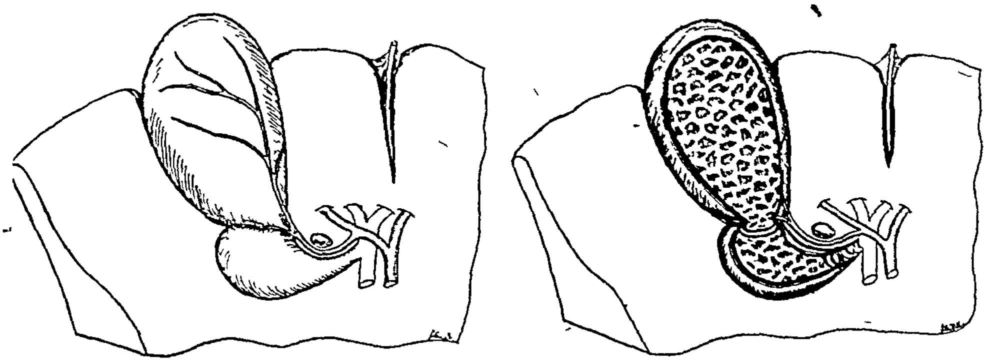
In an endeavour to clear up these discrepancies, we have examined 28 human gall-bladders, removed post mortem, comprising those of 12 children whose ages ranged from eight days to two and a half years, and 16 adults all over forty The specimens were selected only to the extent that gall-bladders showing advanced disease were opened by the autopsy pathologist and only those without obvious disease were handed to us Each specimen included the cystic duct, a part of the common bile-duct and a portion of the liver adjoining the gall-bladder Immediately after removal from the cadaver the gall-bladder was largely emptied of its contained bile by means of a syringe and needle (passed through the fundus), the gall-bladder was then distended with 10% formalin, injected through the same orifice, the hepatic duct and common bile-duct having been ligatured The whole specimen was then immersed in 10% formalin for fixation

---

* The Medical Director General of the Navy informs us that dried serum is now being supplied to all ships as stocks are obtained

PERSONAL OBSERVATIONS

The precise definition of a pouch of Hartmann must be appreciated before its presence can be substantiated While *Broca* maintained that this pouch was a dilatation of the upper part of the cystic duct, and Hartmann that it belonged to the region of the neck of the gall-bladder, they both agreed that it is not a uniform dilatation but takes the form of a sacculation which projects to the right, and from the left side of which the cystic duct continues Externally this pouch is separated from the rest of the gall-bladder by a groove, deeper on the right side, while on the left side the junction of the pouch and the cystic duct forms a sinuous concavity in which Hartmann found a lymph gland Internally two valvular folds of the mucous membrane bound the pouch These arise on the left side from a promontory and diverge as they pass to the right, the upper one lying between the pouch and the rest of the gall-bladder, the lower one (according to Hartmann) separating the pouch from the beginning of the cystic duct These folds are permanent and are not obliterated by artificial distension of the gall-bladder



Adult gall-bladder showing sacculation resembling classical description of Hartmann's pouch

In none of the gall-bladders from the children in our series was there anything resembling a Hartmann's pouch Apart from one showing acute inflammatory changes of moderate degree, these gall-bladders were normal Of the 16 adult gall-bladders, 3 were normal and showed no signs of a Hartmann's pouch The other 13 showed some degree of pathological change, in only one of these was a sacculation present which can be considered to approach the classical description of a Hartmann's pouch (see figure) This specimen showed considerable general dilatation of the gall-bladder and of the extra- and intra-hepatic bile-ducts, indicating long-standing partial extra-hepatic obstruction In the region of the neck of the gall-bladder, as seen externally, a pouch of considerable size projected to the right and downwards It was demarcated from the body of the gall-bladder by a groove, deeper on the right and under surfaces The left side of the neck was concave, in this concavity lay a lymph gland Internally a prominent fold of the mucous membrane projected, forming a circular valve at the junction of the pouch and the body of the gall-bladder, immediately below the pouch the spiral valve of the cystic duct began, there was no fold of mucous membrane in the pouch itself The lower part of the pouch tapered to the left into the beginning of the cystic duct The cystic artery bore an interesting relation to this pouch The main artery ran along the left border of the pouch between the lymph gland and the wall of the gall-bladder and attaining the body of the gall-bladder divided into two main branches which ran respectively on the under and upper surfaces towards the fundus The main stem immediately prior to its bifurcation gave off a branch which ran to the right on the under surface of the gall-bladder in the groove demarcating the pouch

Some points in the anatomy of the other gall-bladders may be noted Of these, all of which had been artificially distended, 5 (2 children, 3 adults) showed slight, and 1 (adult) considerable constriction in the region of the junction of the body and the neck. Below the constriction there was a slight distension of the neck, this distension was uniform in 4 cases (2 children, 2 adults), and slightly greater on the right than on the left side in 2 cases (1 child, 1 adult) Only in 1 of these (adult) was a valvular fold of the mucous membrane present, this extended as a deep, almost circular fold (deficient in its right inferior quadrant) at the site of constriction, otherwise no folds were related to the constriction In each case it was observed that a branch of the cystic artery (as above described) had a close relationship to the constriction One specimen (adult) showed a shrunken, distorted gall-bladder, with a thick fibrous wall Tightly held in the neck, and uniformly dilating it, was a cholesterol stone which blocked the entrance to the cystic duct Above the stone was a dense fibrous contraction ring, just below which was a circular fold of the mucous membrane Below the stone the cystic duct continued from the apex of the dilated neck The remaining 20 gall bladders (10 children, 10 adults) showed no indication whatever of any pathological dilatation, uniform or saccular, of the region of the neck

The relation of the origin of the cystic duct to the apparent apex of the gall-bladder varies considerably In the specimen which exhibited a well-marked Hartmann's pouch, the pouch narrowed as it passed to the left and continued into the duct, the duct thus arose to the left of, and slightly above the "apex" of the pouch In those gall-bladders which distended uniformly without any constriction, the duct commenced at the apex in 10 cases (7 children, 3 adults), a little to the right of the apex in 8 cases (2 children, 6 adults), and a little to the left of and above the apex in 2 cases (1 child, 1 adult) Where a constriction existed between the body and the neck, and the dilatation of the neck was uniform, the duct arose at the apex in 4 cases (2 children, 2 adults), in one case (adult) with a uniformly dilated neck, the duct arose slightly to the right of the apex Where the neck was dilated rather more on its right than on its left side, the duct arose to the left of the apex (2 cases, 1 child, 1 adult) The place of origin of the cystic duct cannot therefore be foretold from an examination of the external configuration of the gall-bladder

DISCUSSION

In our series of gall bladders those considered free from any pathological change (11 children, 3 adults) showed no evidence of a "Hartmann's pouch" This pouch is therefore not a structural feature of the normal human gall-bladder In itself, the absence of such a pouch from the young gall-bladder suggests that the pouch, if present in an adult gall-bladder, is developed later in life The absence of the pouch in the normal adult gall-bladder indicates further that it is the product of pathological changes So far as the literature indicates —and this is borne out by our one specimen showing a pouch—the pouch appears to be associated with a dilatation of the gall-bladder But, as shown in our series, not all pathologically dilated gall-bladders exhibit a pouch; some showed uniform dilatation of the neck separated from a uniform dilatation of the body by a constriction, while in others the neck bulged slightly more on the right side than on the left; this latter may be a stage in the production of the classical pouch We are not able to explain why the dilatation of the neck should be uniform in some cases and saccular in others The relation of the transverse branch of the cystic artery to the constriction at the junction of the body and neck, to which attention is here drawn, may have some bearing on the method of production of the dilatation of the body and neck on either side of this artery (its action being analogous to that of aberrant renal arteries in the production of hydronephrosis), but other factors are also undoubtedly involved In those cases where the neck of the gall-bladder sags downwards a little and then turns sharply into the cystic duct, external appearances may lead to an erroneous identification of a Hartmann's pouch, while internal examination may show no saccular dilatation of the neck The number of gall-bladders examined in the present series is small, yet the information which they yield appears to us to be positive and to warrant our general conclusions

SUMMARY

The saccular pouch of the neck of the gall-bladder, commonly known as the pouch of Hartmann, was originally described by Paul Broca Omitting proper names, it might be called " the cervical pouch of the gall-bladder "

This pouch is not a structural feature of the normal human gall-bladder, either of the child or of the adult

Its presence is associated with a pathological dilatation of the gall-bladder, but it is not present in all dilated gall-bladders

A branch of the cystic artery, which occupies the site of constriction between the cervical pouch and the rest of the gall-bladder, may help to determine the demarcation of the pouch.

We are indebted to Dr L C D Hermitte of the Pathology Department for drawing the figures

REFERENCES

Broca P (1850) in Bonamy Broca and Beau's Atlas d'anatomie descriptive du corps humain, Paris vol III plate 31
Dorland W A N (1940) American Illustrated Medical Dictionary, Philadelphia pp 617, 1127
Hartmann, H (1891) *Bull Soc anat Paris*, 5 480
Virenque, M. (1923) in Hartmann's Chirurgie des voies biliaires, Paris p 21

INTRAPERITONEAL SULPHAPYRIDINE IN ACUTE ABDOMINAL CONDITIONS

R H GARDINER, B M OXFD, F R C S E
SURGEON TO THE ROYAL BUCKINGHAMSHIRE HOSPITAL, AYLESBURY ;
SURGEON TO AN E.M.S HOSPITAL

IN the past year much attention has been paid to the local use of sulphonamides in the treatment of wounds both as a prophylactic and as a curative measure, but there have been few reports on the effects of sulphonamides applied locally in acute inflammation of the peritoneum The earliest experimental work on chemotherapy had a bearing on this method of treatment and Colebrook reported that he had found it useful, but other workers denied its efficacy Hudson and his colleagues (1941) found that in rabbits intraperitoneal sulphanilamide prevented the development of peritonitis when the cavity had been contaminated by the contents of the cæcum, and that it reduced the inflammatory process following resection of the gut Rosenburg and Wall (1941) reported a 50% recovery-rate in rats which had been given a *Bacillus coli* peritonitis and had then been immediately treated by local chemotherapy They also tried the effect of sulphonamides on 10 cases of peritonitis of appendicular origin with encouraging results

I record here the results of the use during the past year of sulphapyridine in some acute abdominal conditions at the Royal Buckinghamshire Hospital and an E M S hospital

CASES AND TECHNIQUE

Of 19 cases treated, 15 were cases of acute appendicitis with perforation of the appendix , several of the appendices were gangrenous, and all the patients had purulent fluid present in the abdominal cavity, with varying grades of peritonitis—2 had general peritonitis All 15 were cases in which I considered drainage of the abdominal cavity essential, and I should also have drained the abdominal wound if chemotherapy had not been employed ' There were also 2 cases requiring resection of the small gut, one owing to adhesions causing gangrene, and the other owing to gangrene from strangulation of a right inguinal hernia Finally there were 2 cases of perforation of the large bowel, one due to a perforated diverticulitis, the other a case in which I accidentally perforated the sigmoid colon during a sigmoidoscopy.

Operation was performed in all cases under general anæsthesia (gas, oxygen and ether). I usually made a right paramedian incision, but used the gridiron incision in some of the appendix cases At the end of the operation, before sewing up, 10 g of finely powdered sulphapyridine was stirred up in 4 oz of saline to make a fine suspension Some of this was then injected with a 10 c cm Record syringe into the peritoneal cavity around the operation area and a second amount into the pelvis The 15 appendix cases and the 2 cases of large bowel perforation were drained with a small tube, either suprapubically or through a stab wound in the right iliac fossa The peritoneum was then sutured, but just before the insertion of the last stitches more of the sulphapyridine suspension was injected into the peritoneal cavity, which was then closed The last of the suspension was injected down the tube, which was at once clipped or closed with a spigot Unless this is done much of the suspension will flow out of the tube and be lost , it is also lost if the peritoneum is not partially closed before the main injection The powdery dregs remaining were rubbed into the wound layers and the abdominal wall was closed Routine treatment followed, and intravenous saline was only given in two or three cases which were complicated by severe toxæmia Except in one case with a pulmonary complication no sulphapyridine was given by any other route

APPENDICITIS

In the cases of appendicitis, instead of a profuse discharge setting in about the 2nd or 3rd day to be followed by a frankly purulent discharge lasting 2–3 weeks, only a thin yellow, almost serous fluid was discharged in no great quantity This gradually lessened and the drainage tube was usually removed on or before the 5th day after operation , the discharge then gradually dwindled away, and in nearly all cases the wound was dry by the 10th day All except one of the wounds healed by first intention and were soundly united by the 10th day The one which did not heal was in an old lady of 75 with a perforated gangrenous appendix and early general peritonitis The wound—a right paramedian—opened in two places each half an inch across to allow a thin purulent discharge to escape for a few days This finally dried up and sound healing followed I felt no anxiety that the wound might break down in this or any other case It does not seem, therefore, that the rate of absorption of catgut is accelerated by the presence of sulphonamides in the wound (Adeney 1941) The general state of the patients did not seem to be affected by the drug There were no signs of intoxication or excessive vomiting and none complained of feeling generally ill, although all these symptoms are commonly associated with the drug given by mouth

A boy of 15 showed signs of a pelvic abscess on the 10th day, but this subsided with fomentations to the abdomen and expectant treatment in 3–4 days In a woman of 41, slight basal pneumonia set in on the 9th day when healing was complete, but she responded well to sulphapyridine by mouth.

The average length of time in bed was 11–12 days and patients were usually discharged home on the 14th day ; one or two cases remained up to 3 weeks, because they were elderly or stout women This is a much shorter time than has been usual in the past, when frank pus drained out of the drainage hole and wound for weeks The average stay in hospital, therefore, has been much diminished This case is typical

A married woman of 20 was delivered of a healthy child after a normal labour on Aug 19, 1941 On Aug 21, at 11 A M , she complained of sudden pain in the right loin She became worse during the day, and appendicitis seemed probable at 6 P M She became rapidly worse in the next two hours, with a pulse rate up to 140, and looked exceedingly ill Operation at 9 A M (gridiron incision) As soon as the peritoneum was opened there was a copious gush of thin yellow pus, and afterwards a large quantity was sucked out She had advanced general peritonitis of a fulminating type from perforation of a gangrenous retrocæcal appendix, with no adhesions The appendix was removed with difficulty A suprapubic stab drain was inserted and a corrugated rubber drain brought out through the gridiron incision Sulphapyridine was put in in the usual manner and a continuous drip saline started at once Thin yellow fluid drained for 6 days Her only trouble was the loss of the breast milk, which was deliberately dried up She ran a slight fever for 2 days, but made an uninterrupted recovery and was discharged on Sept 2

PERFORATION OF LARGE GUT

In the two cases of perforation of the large gut end results were also good In a case of perforated diverticulitis with advanced pelvic peritonitis a small hole in the pelvic colon was closed and reinforced with an appendix epiploica, the pelvis was drained after sulphapyridine had been put in In a case of perforation of the sigmoid colon with the sigmoidoscope laparotomy was done at once A rent ½ in long was found in the pelvic colon and was closed with two tiers of fine catgut sutures, a small quantity of fæcal matter was mopped out of the pelvis, which was drained and had sulphapyridine put in In neither case was a colostomy performed and both made a good recovery, although the second case showed signs of mild intestinal obstruction which later disappeared

ACUTE OBSTRUCTION REQUIRING RESECTION

A youth of 18, who had been operated on for appendicitis as a baby, was admitted after 2 days of repeated vomiting and a distended abdomen At operation most of the small gut was found to be obstructed, with dense adhesions in the right iliac fossa A coil of the ileum was bound down by adhesions and when released 2 in of it were found to be gangrenous, 2 ft of gut were resected and the bowel united by a side to side anastomosis Sulphapyridine was placed in the abdominal cavity and the abdomen closed without drainage After a rather stormy convalescence the patient made a complete recovery

A man, aged 49, was admitted with a strangulated right inguinal hernia of 20 hours' duration A sac containing foul fluid with 3 in of gangrenous ileum was found and opened The obstruction was released and 2 ft of bowel was resected and an end to end anastomosis done Sulphapyridine was placed in the abdominal cavity, the inguinal canal was rapidly repaired and the wound closed without drainage He stood the operation well and appeared to make good progress, except for a little vomiting, until the 5th day, when his temperature rose to 102° F and his pulse rate to 100, these fell on the 6th day, the pulse rate remaining at 90 Clinical examination failed to elicit any signs, his abdomen was never rigid or tender, and his tongue was clean On the 7th day he began to vomit slightly and complained of abdominal pain and diarrhœa, but there were still no physical signs He collapsed and died suddenly on the morning of the 11th day At autopsy (abdomen only) the wound was soundly healed, there was a general plastic peritonitis, with matting together of the small gut, and large quantities of glairy purulent material The bowel tore open when attempts were made to separate its coils, especially round the site of the anastomosis, although union appeared to be satisfactory

DISCUSSION

Unfortunately I have not had the abdominal fluid in these cases examined bacteriologically, and no record was made of the blood sulphapyridine concentration These should be recorded in all future work on these lines For success, the bacteria responsible for the peritonitis must be susceptible to the drug employed, and this must be adequately distributed and must persist in situ long enough to be effective In the only case in my series which came to autopsy there were no signs of sulphapyridine remaining 11 days after its insertion into the abdominal cavity

A combination of local and systemic administration will possibly give even better results The sound healing of the wounds in this series suggests that in future the incidence of postoperative hernia will be greatly lessened I have seen one case of wound phagedæna following the removal of a gangrenous appendix in a fat old lady, in whom spread was rapid and a large area of abdominal skin was soon involved with fatal results Chemotherapy in the wound may make such rare disasters impossible

SUMMARY

A series of 15 cases of perforated appendix, 2 cases of perforation of the sigmoid colon and 2 cases of resection of gangrenous small gut have been treated with intraperitoneal sulphapyridine

All cases except one recovered, and none had the prolonged outpouring of thick pus from the abdominal cavity and wound common in such cases The period in hospital was thus much shortened One patient died of peritonitis

In further trials of this measure bacteriological examination of the abdominal fluid and records of the blood sulphonamide should be done

REFERENCES

Adeney, N F (1941) *Brit med J* ii, 824 see *Lancet*, 1941, ii, 288
Hudson, R Vaughan, Selbie, F R and Smith, R (1941) *Lancet*, i, 438
Rosenburg, S and Wall N H (1941) *Surg Gynec Obstet* 72, 568

PERSISTENT MYALGIA FOLLOWING SORE THROAT

L E HOUGHTON,
M D CAMB
PHYSICIAN TO THE COUNTY
SANATORIUM, HAREFIELD,
MIDDLESEX

E IDRIS JONES,
M D LOND, M R C P
PHYSICIAN TO HAREFIELD
E M S HOSPITAL

DURING the last war, myalgia was an extremely common diagnosis for pains apparently arising in the muscles A big proportion of cases so diagnosed proved to be trench fever, and since the virtual disappearance of that disease after the war little has been written on muscle pain The recent outbreaks of trichiniasis have roused fresh interest in this subject In this paper a small epidemic of myalgia is recorded and its clinical features and differential diagnosis discussed

CLINICAL PICTURE

The cases described were members of the nursing staff all of whom started the illness with a streptococcal sore throat, but the streptococci were of different types After a day or two in which they ranged up to 103° F the temperatures fell almost to normal and then rose again maintaining a range of 98°–99° F in the mornings to 100°–101° F in the evening, this rise persisting for periods of from 3 weeks to 5 months in different cases Rectal temperatures, taken over a week, confirmed a true pyrexia

Some 8–21 days after the initial sore throat pains appeared in the muscles, a common sequence being pains in the left side of the chest, then in the calves of legs, thighs, arms and neck The pain was aggravated on movement, was always worse at night and was sufficiently severe to withstand the action of A P C tablets, and 'Nepenthe' and aspirin Three types of pain were complained of in the limbs—a dull boring pain, a sharp localised pain, and a shooting pain running the length of a muscle to the toes or fingers The chest pains disappeared after a few days but the limb pains sometimes persisted for months The skin overlying a painful area was never reddened or indurated Seldom was pain complained of in the identical site for more than 2 days, flitting being a pronounced feature The painful area was usually in the belly of a muscle near its free border or near the musculotendinous junction and on many occasions a definite hardening could be palpated in a muscle over the area complained of and pressure on this area produced acute pain shooting down the limb In one case with pain in the supinator longus muscle, a skin incision was made and pressure exerted directly on the exposed muscle which had felt hardened, a sharp pain was produced identical with the previous spontaneous pain A biopsy on a piece of muscle which appeared indurated showed no abnormal histological features, and aspiration of a small quantity of fluid from a similar area was sterile on culture on ordinary media, on the chorioallantoic membrane of a chick, and on injection intracerebrally and intraperitoneally into mice Owing to the flitting of the pains local injection of 'Procaine' was not feasible, and salicylates, sulphonamides, vaccines and local heat had no noteworthy effect In no case did a cutaneous eruption appear

Other striking features of the series were severe headache, with neck rigidity in one case, coming and going for weeks or months, waves of depression, and menstrual disturbances in the form of amenorrhœa, delayed periods or oligomenorrhœa Epistaxis was common and hæmorrhages appeared under the lunules of the nails of the toes in two cases Apart from a mild grade of anæmia, the blood-count was normal in all, the blood-sedimentation rate was but slightly raised and agglutination reactions for *Brucella abortus*, Weil's disease and the enteric group were all negative Cerebrospinal fluid was normal in the one case lumbar punctured All the patients eventually made a complete recovery with no residual symptoms

A careful investigation was made to try and determine a common cause for these cases All the patients ate the same type of food but all were not taken ill simultaneously nor was there any gastro-intestinal disturbance The small number of people affected in comparison with the several hundred eating the food seemed to exclude this possibility The nurses were not on duty in the same ward and there was no evidence whatsoever of any insect vector being involved Mosquitoes were plentiful but again the small number of cases in relation to the number bitten seems to eliminate this possibility

Trichiniasis, however, had to be excluded further, in view of the outbreaks recorded by Sheldon (1941), Lee (1941) and Garrod and Maclean (1941) The subungual hæmorrhages were suggestive, but the absence of œdema of the eyelids, the normal blood-count (see Della Vida and Dyke 1941), the negative biopsy and the long course with the flitting type of pain seemed to rule out that diagnosis fairly definitely Through the kind assistance of Dr J R Hutchinson of the Ministry of Health, Dr Paul Beeson performed skin tests and the precipitin reaction with trichinella antigen on five of the patients in April, 1941, and found all tests negative The negative X-ray findings, as indicated by Beeson (1941), are of no significance for or against trichiniasis

CASE-HISTORIES

CASE 1—Aged 22 Admitted Nov 5, 1939, with sore throat and pains in the back Temperature 99° F, injected fauces but nothing else abnormal Sulphanilamide, 1 g, given 4-hourly for 6 doses, but temperature remained in the region of 100°–102° F and the sore throat persisted Heart and lungs normal throughout Pulse rate usually 80–90 Spleen not palpable at any time She felt ill and had severe headache A course of sulphapyridine (total 4 g) also had no effect on temperature or sore throat On Nov 20 she complained of pain in left side of chest near sternum. On Nov 22 chest pain had gone but pains now appeared in legs and persisted, being worse at night and on movement, exact site of pain varied almost daily A week later had pains in arms shooting down to fingers, with a dull ache when shooting was not present Menses a week late Severe headache continued with suggestion of neck rigidity at times In December muscular pains were still present but a little less severe An autogenous streptococcal vaccine had no beneficial effect In January, 1940, pains were very bad, mainly localised in right sternomastoid and calf muscles Palpable thickening in right sternomastoid at site of pain, no definite thickening in calf muscles No cutaneous eruption Epistaxis occurred on two occasions and a spontaneous hæmorrhage appeared under nail of right big toe Several bouts of depression during illness, usually associated with severe headache At end of January pains gradually disappeared and 10 days later the temperature (which had ranged from 99° to 101° F throughout the illness) had fallen to normal Recovery was complete

Investigations—Culture of throat swab streptococci type 22 present Blood count on Nov 23 red cells 4,430,000, Hb 90%, white cells 7000 (polymorphs 51%, eosinophils 2%, mononuclears 12%, lymphocytes 35%) Feb 5 polymorphs 61%, eosinophils 3%, monocytes 8%, lymphocytes 28% Wassermann and Widal reactions negative Agglutination reactions for Weil's disease and undulant fever negative Blood sedimentation rate (Westergren) 5 mm per hour CSF normal Fæces excess of enterococci

CASE 2—Aged 33 Admitted Oct 29, 1939, with sore throat and shivering Temperature 103° F Fauces inflamed with grey exudate on left tonsil Sulphanilamide given, and temperature fell to normal in 4 days after 2 days rose again and continued to niggle up to 100° F for 3 weeks Further doses of sulphanilamide failed to affect temperature Fauces and tonsils remained injected for a week, then cleared On Nov 4, complained of headache, which persisted, treated with tab A.P C On the 11th had severe pains in back of neck On the 21st had bad pains in legs, headache and recurrence of sore throat Next day leg pains had gone but had pain in right sternomastoid, indurated area could be palpated for 2 days in this muscle, ½ in from its insertion, corresponding to site of pain On the 24th all pains had disappeared; temperature normal on the 25th, and she subsequently remained free from symptoms

Investigations—Throat swab grew a hæmolytic streptococcus No agglutinations done Blood count on Nov 23 white cells 9200 (polymorphs 56%, eosinophils 1%, monocytes 6%, lymphocytes 37%) B S R 16 mm per hour.

CASE 3—Aged 34 Admitted Oct 22, 1939, with a cold Temperature 98 8° F Oct 30 sharp pain in left side of chest and pains in legs, felt ill and had slept badly No evidence of infection in throat and no abnormal physical signs in any system No rash or splenic enlargement Temperature 99°–101° F in evenings for 6 weeks from date of onset On Nov 2 had sore throat and pains all over Nov 4 and 5 sulphanilamide given with no effect on temperature, pains a little better On the 10th temperature rose to 100 4° F, not affected by sulphapyridine Salicylates also ineffective Pains in legs persisted until Dec 2 when they improved As in case 1, they varied in intensity and location Muscles tender at site of pains but no induration felt Menses lasted 2 days instead of usual 7 days Had difficulty in micturition for which no local cause was found Headaches occurred but were not severe Dec 2 temperature returned to normal, and on the 19th she was discharged symptom-free

On returning from sick leave on Jan 4, 1940, she reported that she had had pains in the legs while she was away and that on Dec 22 her legs had swelled up from knees to ankles, the swelling being confined to the calf muscles which were very painful and sore to touch While her legs were swollen (Dec 22–24) there was oozing of blood from the cuticle of each nail of both feet lasting for one day only Patient is a credible witness On Jan 19 was still having pains in legs and frequent headaches, menses now occurred every fortnight By the end of January had made complete recovery

Investigations—Throat swab grew few hæmolytic streptococci and many indifferent streptococci Agglutination for Weil's disease negative B S R (Westergren) 3 mm per hour Urine normal Blood count on Nov 23 red cells 3,690,000, Hb 70%, white cells 7800 (polymorphs 59%, eosinophils 2%, monocytes 6%, lymphocytes 33%) X ray of limbs and pelvis in April, 1941, showed no calcification in muscles

CASE 4.—Aged 24 Admitted Oct 13, 1939, with sore throat and hoarseness Diagnosed as simple laryngitis. Temperature ranged between 101° and 102° F for 6 days, then settled to normal Sore throat disappeared, and apart from sleeping badly she felt fairly well On Oct 30 had pain in left side of chest and temperature rose to 98 8° F No abnormal physical signs, X ray of chest normal Next day chest pains still present, and also pains shooting all over body On Nov 2 pains in all joints and severe headache in spasms Temperature 99° F each evening Pains later in muscles of legs and neck, and definite thickening could be felt in painful neck muscles Fainted frequently (never having fainted previously) and had attacks of vomiting after food Pains and headaches persisted, muscle pains, as in the other cases, were flitting Pains still present on Dec 7 but she felt much better Temperature for the previous 5 weeks had been 100°–101° F in the evenings and had not been affected by sulphanilamide, aspirin and nepenthe, or Dover's powder An autogenous hæmolytic streptococcal vaccine had no beneficial effect On Jan 12 still had pains in legs, temperature 99° F in the evenings Occasional headaches and fainting attacks continued Menses normal throughout

Investigations—Throat swab grew hæmolytic streptococci, *Streptococcus viridans* and many indifferent streptococci. B S R on Dec 18 at height of pain, was 2 mm per hour Culture of fæces showed excess of streptococci Blood-count on Nov 23 red cells 3,300,000, Hb 67%, white cells 6000 (polymorphs 46%, eosinophils 2%, monocytes 5%, lymphocytes 47%)

CASE 5—Aged 23 Admitted Oct 31 with sore throat and headache Tonsils injected, with exudate Temperature 102° F, fell to normal in 2 days after sulphanilamide 3 g Sore throat persisted and temperature rose again on Nov 12 and continued to rise to 100° F in the evenings for further fortnight On Nov 21 complained of headaches pains in calves at night, later, pains in arms and shoulder muscles, not severe—a dull ache An autogenous streptococcal vaccine had no effect Dec 16 was free of pain and remained well subsequently Menses a week overdue on one occasion, but otherwise normal

Investigations—Culture from throat grew hæmolytic streptococcus, Lancefield group A, type not determined Blood count on Nov 23 white cells 8000 (polymorphs 50%, monocytes 12%, lymphocytes 38%) B S R 18 mm per hour X ray of limbs and pelvis in April, 1941, showed no calcification in muscles

Case 6—Aged 23 Admitted Oct 27 for sore throat following a cold, exudate on both tonsils Appeared to have severe tonsillitis, no other abnormal findings Temperature raised at first but soon fell, rose again after 2 days to 99 6° F each evening Sulphanilamide 3 g, followed a week later by sulphapyridine 8 g, had no effect on temperature or general condition On Nov 6 pains in muscles of chest, back and legs Later, pain in arms as well as legs, worse at night or after bath, site varying from day to day Tender indurated areas in muscles of calves, thighs, neck and arms, pressure on these reproduced pain Biopsy on a piece of muscle tender on exposure revealed nothing abnormal except doubtful increase in sarcolemma nuclei Fluid aspirated from another painful area cultured for bacteria and virus with negative results Pains of three kinds dull ache, sharp localised pain, and shooting pain running into fingers or toes, cramps common at night in legs Severe headaches almost every day, periods of depression prominent No evidence of intracranial mischief, no alteration in deep reflexes Headache controlled by tab A P C, but temperature and pains unaffected by salicylates, aspirin and nepenthe, Dover's powder, sulphanilamide or sulphapyridine Autogenous streptococcal vaccine had no beneficial effect No signs of cardiac or pulmonary involvement, X ray of chest negative, blood-pressure 128/80 mm Hg No skin eruption Spleen not palpable Menses 11 days overdue, otherwise normal Blood culture negative Skin tests with streptococcal endotoxin negative Wassermann and Widal reactions and agglutinations for *Br abortus* and Weil's disease negative Nov 23, blood count white cells 7200 (polymorphs 64%, eosinophils 1%, monocytes 6%, lymphocytes 29%) Dec 18, when pains severe, B S R 4 mm per hour Temperature continued to rise to 100°–101° F until January, 1940, when antrostomy done on left maxillary antrum, which was full of pus giving a pure culture of *Staphylococcus aureus* Operation had no effect on symptoms Feb 5, blood count red cells 4,540,000, Hb 80%, white cells 6400 (polymorphs 60%, eosinophils 2%, monocytes 5%, lymphocytes 33%) B S R 17 mm per hour Temperature, pains and headache persisted until March, she was then allowed home where her condition remained unchanged until July 1940 when she gradually recovered

Case 7—Aged 19 Admitted Nov 6, 1939, with sore throat Temperature 101° F, exudate on both tonsils Throat swab grew a hæmolytic streptococcus, type 2 After sulphanilamide, 3 g, temperature fell to normal and remained so for 5 days, sore throat having disappeared Temperature then rose to 99 2° F and continued to rise each evening up to 100 4° F for a fortnight, then falling to normal, she felt well despite temperature Observed for a further fortnight but remained afebrile, and has remained well since This case appears to be a forme fruste of the other cases

DISCUSSION

Gowers (1899), Langmead (1923), Levison (1937), Blau (1938) and Somers (1939) have described cases of polymyositis whose essential features were slow progress, lack of severe pain, "pasty" feel and eventual paralysis of the affected muscles The overlying skin was glossy and œdematous and many were cases of dermatomyositis Fever was usually absent except in the early acute stage The condition may follow a wide variety of infections such as the exanthemata, typhoid, tuberculosis or erysipelas (Kinnier Wilson 1940) Others (Krohn 1937, Sick 1905, McAlpine 1935, Rotky 1912) have described cases of acute recurrent polymyositis, most of which showed a high eosinophilia but no evidence of trichiniasis The general course and symptoms were different from the cases we have described above Bornholm disease—epidemic myalgia—as described by Pickles (1933), Sylvest (1934), Macdonald (1938) and many others, resembles our cases in the distribution of the pains but differs in the other symptoms and the short course of the disease We consider that the absence of true joint pains and cardiac involvement, together with the normal B S R and failure of salicylates to influence the pain, eliminates rheumatic fever, and the flitting and other characters of the pain, with the constitutional symptoms, are unlike simple fibrositis Gutstein-Good (1940) suggests the term idiopathic myalgia for pains arising in muscle for which no obvious cause can be found In his cases the affected areas remained constant and did not shift their location from day to day and referred pain was a prominent feature

The condition which resembles our cases most closely is trench fever. The severe headache, flitting pains and long course extending over weeks or months, with pyrexia and eventual complete recovery are striking resemblances Byam (1922) notes that three types of pain are common in the limbs in trench fever boring, aching and shooting These are similar to the pains in our cases The complete absence of lice and of the typical macular rash, however, serve to distinguish the two conditions

The term myalgia is preferable to myositis in the description of this condition, since there is no histological evidence of inflammation No common ætiological factor could be found in these cases except a preceding sore throat, and the course was essentially the same in all except for the length of time the condition persisted The similarity of the condition to trench fever and Bornholm disease suggests a myotropic strain of virus, and in the absence of positive bacteriological findings we suggest tentatively that an unidentified virus is the cause Further work on similar cases should settle the problem

Lately Williams (1941) has described a small epidemic of myositis in Service personnel in the spring of 1940 His cases had evidence also of a true neuritis, with meningeal symptoms and a rash, and in various other ways differed from our cases A virus infection was assumed, as for our cases, and it is possible that our epidemic was a milder but more prolonged form of the condition described by Williams

SUMMARY

Seven members of the nursing staff of a hospital developed sore throat, followed in 8–21 days, in six of them, by pains in the muscles and severe headache Two cases showed subungual hæmorrhages in the toes Pyrexia and pains persisted for up to 5 months, and there were menstrual disturbances and spontaneous epistaxis All investigations done, including skin tests and precipitin reactions for trichiniasis, gave a negative result Biopsy of a painful indurated area in a muscle showed no abnormal findings and no treatment was found to be of any value All the cases made a complete recovery without any sequelæ It is suggested that the condition is due to an unidentified myotropic strain of virus

We wish to thank the County Medical Officer of Health for Middlesex and Dr K R Stokes, medical superintendent of Harefield Sanatorium, for permission to publish these cases, Prof Alexander Fleming for his help in the bacteriological investigation, Dr F Himmelweit for help in the search for a virus, and Dr J R Hutchinson, of the Ministry of Health, and Dr Paul Beeson for their help in excluding trichiniasis

REFERENCES

Beeson, P B (1941) *Lancet*, ii, 67
Blau, A (1938) *J Mt Sinai Hosp* 5 432
Byam, W (1922) Official Medical History of the War, Medical Services Diseases of the War
Della Vida, B L and Dyke, S C (1941) *Lancet*, ii, 69
Garrod, L P and Maclean, D (1941) *Brit med J* i, 240
Gowers, W R (1899) *Ibid*, i, 65
Gutstein Good, M (1940) *Lancet* ii, 326
Kinnier Wilson, S A (1940) Neurology, London, p 439
Krohn S E (1937) *N Y St J Med* 37, 10
Langmead, F S (1923) *Arch Pediat* 40, 112
Lee, J F S (1941) *Brit med J* i 237
Levison P (1937) *Acta psychiat, Kbh* 12, 89
Macdonald R R (1938) *Penn med J* 41, 919
McAlpine, D (1935) *Trans med Soc Lond* 58, 29
Pickles, W N (1933) *Brit med J* ii, 817
Rotky, H (1912) Uber Polymyositis Acuta, Wien
Sheldon, J H (1941) *Lancet* i 203
Sick, K (1905) *Münch med Wschr* 52 52, 1092
Somers, D C (1939) *J Bone Jt Surg* 21, 414
Sylvest, E (1934) Epidemic Myalgia, Oxford
Williams, D (1941) *Quart J Med* 10, 283

PYRUVIC ACID TEST FOR VITAMIN-B_1 DEFICIENCY IN CHILDREN

H ELLIS C WILSON, M B , D SC GLASG , F R F P S
BIOCHEMIST TO THE ROYAL HOSPITAL FOR SICK CHILDREN, GLASGOW

Now that the public has been exposed to war conditions and a restricted diet for over two years the medical profession is justified in being on the watch for signs of incipient malnutrition and deficiency disease The clinical signs of the fully developed deficiency diseases are well known but it would obviously be an advantage if biochemical findings could give warning of the early changes and hence suggest an alteration in the quantity or quality of the diet, particularly in children At present there are no signs of clinical beriberi but with existing restrictions in our diet, some degree of vitamin-B_1 shortage is possible , this is the more likely since the proportion of carbohydrate in the diet is increased and there is consequently a heightened demand for B_1 The proposed fortification of bread with vitamin B_1 must be regarded as a measure for forestalling a deficiency of that vitamin

Platt and Lu (1936) have provided a means of detecting B_1 deficiency They found that in human subjects suffering from beriberi the blood pyruvic acid was increased from the normal value of about 1 mg to 3 mg per 100 c cm It seems likely, therefore, that in subclinical states of B_1 shortage there will be an increase of pyruvic acid in the blood above the normal values The blood pyruvic acid in a series of children in the Royal Hospital for Sick Children, Glasgow, has therefore been estimated Two classes of children were examined children just admitted to hospital for the removal of tonsils and adenoids, that is, before they had been subjected to a hospital diet (the normal cases), and children in hospital suffering from various diseases, grouped as surgical cases, medical cases and cases under ether anæsthesia The method of estimation depends on the formation of a pyruvic acid dinitrophenylhydrazone from the blood filtrate Klein's (1941) modification of Lu's (1939) method was adopted , this eliminates the error due to the presence of aceto-acetic acid

RESULTS

In children on home diet (those just admitted to hospital) the average blood pyruvic acid is 0 99 mg per 100 c cm (see table) This agrees closely with the figure (0 96 mg per 100 c cm range 0 7–1 2 mg) obtained by Wortis and his colleagues (1941) from a poor class of children in the United States and considered by them to be normal The second group (surgical cases) includes children who had been in hospital for varying periods after operations for cleft palate, hernia, appendicectomy, &c , the blood was taken in all cases when they were almost due for dismissal and none had fever at the time These cases had all been operated on 7–30 days before and were apparently healthy when the blood sample was taken The object of including them was to ascertain whether hospital diet over a period of 7–30 days had any effect on the blood pyruvic acid as compared with that of children in group 1 who had just come from home The average figure is approximately the same as that found in the first group although the range is somewhat greater The third group (medical cases) are all just above or below the average although the range is greater than that found in groups 1 and 2 In the few cases in which blood was taken while the patient was under ether anæsthesia, the figure was below the average The blood was taken when they had been under ether for at least half an hour The low values may possibly be associated with the disturbance of carbohydrate metabolism which Macintosh and Pratt (1938) have shown to occur in anæsthesia, for pyruvic acid is known to be one of the intermediate products of carbohydrate oxidation

BLOOD PYRUVIC ACID IN CHILDREN JUST ADMITTED TO HOSPITAL FOR TONSILLECTOMY AND IN OTHERS IN HOSPITAL FOR VARIOUS CONDITIONS

Group	No of cases	Average pyruvic acid	Range
		(mg per 100 c cm)	
1 Just admitted	35	0 99	0 63–1 22
2 Surgical conditions (7–30 days after operation)	30	1 05	0 54–1 36
3 Medical conditions			
Upper respiratory infections	8	0 84	0 53–1 17
Gastro-enteritis	12	1 13	0 72–1 8
Marasmus	4	1 05	0 90–1 2
Convulsions and rickets	6	0 93	0 76–1 3
Renal and urinary infections	8	0 91	0 69–1 98
4 Under ether anæsthesia	7	0 67	0 54–0 91

These data indicate that the blood pyruvic acid in normal children of the hospital class is not raised above the figure found in a similar class of children studied in America, and this seems to suggest that there is no deficiency of vitamin B_1 in their diets In children with gastro-enteritis, nephritis or convulsions high values were found in a few cases although there were no clinical signs of B_1 deficiency

REFERENCES

Klein D (1941) *J biol Chem* **137**, 311
Lu, G D (1939) *Biochem J* **33**, 249
Macintosh R R and Pratt C L G (1938) *Brit med J* ii 695
Platt, B S and Lu (1936) *Quart J Med* **5**, 355
Wortis, H Goodhart, R and Bueding, E (1941) *Amer J Dis Child* **61**, 226

BARBITURATE POISONING TREATED WITH PICROTOXIN

MAURICE FISHMAN, M B LOND

SINCE barbiturate overdosage was first treated by the intravenous administration of picrotoxin solution seven years ago 25 cases have been recorded Of these 18 have recovered and in the remainder life was prolonged [1] The following case was successfully treated by this method

A married woman of 54, while in a state of alcoholic intoxication, attempted suicide by taking 1 46 g (gr 22½) of pento barbital sodium ('Nembutal ') This was at 2 P M on Sept 23, 1941 At 2 45 P M , when I first saw her, she was in deep coma, collapsed, and did not respond to any external stimulus Respiration was shallow, rate 24 per min , pulse regular but of poor volume, rate 60 per min , temperature subnormal The skin was cold and dry The corneal reflex was absent and the pupils were pin point, not reacting to light She was at once given 3 2 c cm of 'Coramine' intramuscularly and a mixture of CO_2 and air by mouth Warmth was maintained by an electric blanket There was no obvious change and a further 2 c cm of coramine was given 15 min later This resulted in some improvement in pulse volume and respiration became deeper, but the patient remained in a deep coma which showed signs of becoming deeper

At 4 16 P M a 0 3% (isotonic) aqueous solution of picrotoxin became available and intravenous injection was begun, the dosage being as follows

1st injection	4 16 P M	1 c cm
2nd „	4 27 P M	1 5 c cm
3rd „	4 45 P M	2 c cm
4th „	5 5 P M	3 c cm
5th „	5 45 P M	1 5 c cm

The total amount of picrotoxin solution given was 9 c cm , which contains 27 mg of picrotoxin About 5 min after the 1st injection breathing became deeper and more normal in character, but at the end of about 20 min the patient relapsed into her former state After the 2nd injection the improvement was repeated, the pupils dilated and the corneal reflex returned Towards the end of a further 20 min. these improvements showed signs of subsiding and the 3rd injection was given After this, the patient became restless for a few minutes and slight muscular twitchings were observed around the mouth After the 4th injection the patient became increasingly restless, responded to external stimulation and there was profuse salivation There was still evidence of these improvements slightly subsiding 40 min later, so a further 1 5 c cm of picrotoxin solution was given The patient now made involuntary movements and spoke incoherent phrases She made several attempts to get out of bed and had to be restrained She later fell into a peaceful sleep and awoke some four hours later in a normal mental and physical state

---

[1] Lovibond, J L and Steel, G C *Lancet* 1939, ii 561

COMMENTS

A dose of gr 22½ of pentobarbital sodium is sufficient to cause severe barbiturate intoxication, sometimes fatal.[2] The intravenous injection of picrotoxin solution was carried out when the drug was having its maximum effect The amount of picrotoxin administered was adequately divided and spaced, so as not to provoke convulsions but to produce restlessness and spontaneous movements Injections were continued until a substantial decrease in coma became apparent and the patient did not relapse as the effect of the picrotoxin wore off

---

Reviews of Books

Year Book of Radiology, 1941

Editors C A WATERS, M D, W B FIROR, M D, I L KAPLAN, M D Chicago Year Book Publishers, London H K Lewis Pp 440 27*s* 6*d*

THE present difficulty in obtaining foreign scientific periodicals will make this tenth Year Book specially welcome to British radiologists with its well-illustrated abstracts on X-ray diagnosis and therapy In the bone section there are good abstracts on pseudo-fractures, on bone and joint changes resulting from interruption of circulation, and on the joint changes in hypothyroid children, these seem identical with those in osteochondritis of the hip-joint Efforts are being made to improve so-called contrast media, three of which are described From Farinas in Cuba comes a paper showing the advantages of iodoxyl over iodised oil in lung investigations Nichols and Nosik of the Cleveland Clinic describe a safe method of using 'Thorotrast' instead of iodised oil for myelography, 80% of the thorotrast can be recovered by forced drainage and the little remaining is well below the minimal amount from which toxic changes have been observed And Rating of Breslau describes good results from using phenylpropionic acid instead of sodium tetraiodophenolphthalein for visualisation of the gall-bladder In the gastro-intestinal section there is a careful abstract of Golden's fine paper on abnormalities of the small intestine in nutritional diseases and a report on 15 cases of megacolon successfully treated by acetylbetamethylcholine

Dr Kaplan, in his introduction to the section on radiotherapeutics, laments the disruption of research work in Europe and believes that dominance in scientific achievement (especially in radiology) has shifted to the United States His selection of abstracts on radiation biology and cancer is excellent and his editorial comments reveal his wide experience There are two important papers by Robinson and Lecutia on the results of million volt therapy as compared with the usual 200 kV therapy

Psychotherapy

LEWELLYS F BARKER, M D, emeritus professor of medicine, Johns Hopkins University London D Appleton Century Co Pp 217 8*s* 6*d*

THIS book begins with a description of psychiatric case-taking after which a plan of adequate treatment is discussed Somewhat arbitrary statements crop up, for example we are told that a patient with anxiety and marital disharmony, who took alcohol to drown his sorrows, should "correct the faulty habits at once and become a total abstainer" Such advice almost suggests the work of a conscientious and humourless amateur, and the chief defect of the book lies in the author's inability to weigh up the relative resistances which are to be met with in anything so variable and unstable as neurotic patients All methods of treatment are given a carefully considered description, but of so superficial a kind as to serve as nothing more than a reminder Short sections on religious miracles, mesmerism, and cures through magic, are discussed alongside methods of group analysis, persuasion and suggestion It is also a little startling to find descriptions, in a few lines, of delirium tremens and uræmic delirium in a volume on psychotherapy The value of the work lies in its survey, in brief space, of many methods and schools of thought which are apt to be neglected The list of works available and consulted with which the book concludes is commendably thorough

Housing for Health

C E A WINSLOW, Dr P H, chairman of committee on hygiene of housing, American Public Health Association Pennsylvania Science Press Printing Co Pp 221 $1 00

THIS book answers the question "What has housing to do with health?" in an interesting, clear and factual way To gain full value of the dozen papers on the sociological aspects of housing which it contains, the appendix should be read first Here thirty basic principles of healthy housing are defined, ranging from fundamental physiological and psychological needs to protection against disease and accident The papers are based on social surveys of American cities, statistical surveys make it evident that poverty is the primary cause of slums Experience has shown that unless slum dwellers are rehoused in dwellings of a minimum standard at rents which they can afford (through housing subsidies) slum-clearance is merely slum-shifting

Some of the factors—such as temperature regulation, ventilation and plumbing—might be regarded as the province and responsibility of the architect, but it seems these physical factors have a considerable effect on the habits of the family occupying a dwelling "The design or building of every house is an act of social importance It influences the future trend of family life By force of material environment, it presses family life into one shape or another" Thus the architect, because he is concerned chiefly with technical consideration, should not alone decide the character of home Homes are places that are lived in, yet too often they are designed as boxes with standard subdivisions labelled living-room, bed-room and kitchen, without any reference to the habits and conditions of the family who are going to occupy them A group of workers in Stockholm, sponsored by the Swedish Cooperative Building Society, studied actual habits of 215 families, showing the times spent in each room by the various members of the family and what they did there The family comments on the convenience or otherwise of the general lay-out, and the relationship of stoves, sinks and cupboards were all noted The investigators concluded that "the best mechanical equipment in the home will not compensate for mediocre planning"

In America local housing authorities and health departments find it increasingly difficult to know whether health is ancillary to housing, or housing is ancillary to health Encouraged by public opinion they have created joint committees

Sex Problems and Youth

THEODORE F TUCKER London George Allen and Unwin Pp 120 5*s*

THE author of this little book has had a wide experience in dealing with the young and knows how to hold out a helping hand to them without in any way being superior or patronising The only sexual aberrations dealt with are masturbation and homosexuality, the book having been written primarily for "the normal person who is a bit bothered with all this sex business and wants to get his ideas straightened out" It will certainly be helpful to many, not only to the young themselves, but also to parents and others struggling, often all too blindly, to help them Mr Tucker demands high ideals in facing the problems of sex and some will find it difficult to follow him all the way, but as Dr Harry Roberts says in his foreword, "healthy self-control must be based on a sound philosophy of life and in the cultivation of ideals which are real to us"

Neuroses and Psychoses of War

ALEXANDER FRANK, M D Vienna Sydney J H Down Pp 93

THIS little manual is built on experience of the last war, especially in the Austrian Army, and follows customary lines The writer, a Roumanian, educated in Vienna and now living in Australia, writes chiefly for doctors who have no special knowledge of psychiatry The exposition is at times slapdash, and ill-considered statements are rather common—such as "these images may appear in the writings of nervous men atavistically," and "the lack of drinking water and excessive perspiration after marches caused concentration of urea in the blood and predisposed them to sunstroke" But in the main the advice given is sensible, though at some points hardly appropriate to the problems of this war

---

[2] Sollman, T Manual of Pharmacology, Philadelphia, 1936, p 737

THE LANCET

LONDON SATURDAY, FEBRUARY 14, 1942

VITAL STATISTICS UNDER WAR

ONE result of the war has been the enforced absence of the Registrar-General's annual stocktaking of the nation's health and well-being as measured by birth-rates and death-rates His last report relates to the year 1938 and many workers, besides the professional statisticians interested in public health and allied subjects, have felt keenly the loss of data at a time when measures of the population's reactions to favourable and unfavourable factors are especially wanted Fortunately the Registrar-General has lately found it possible to add to his quarterly return a new table which shows the trend of mortality since 1938 from 36 causes of death of special interest in time of war A clear summary and discussion of the more important features of this table are given by Dr PERCY STOCKS on our opening page

The general mortality has, of course, been affected by bombing, though not to the extent that was expected—some 40,000 deaths in roughly a year is an addition of approximately 10% to the normal death-rate of the country as a whole Deduction of these and other deaths due to violence gives a measure of the war-time course of fatal disease, and reveals a reasonably satisfactory position In the first quarter of both 1940 and 1941 mortality was relatively high, but both years had severe winters superimposed on any special war effects The second quarter of 1940 was normal in its death-rate, while that of 1941 shows a very slight rise The third and fourth quarters show no significant change except, it is good to note, an unusually low rate in the third quarter of 1941 Underlying this general picture we have on the debit side of the account a decided increase in deaths from respiratory tuberculosis (about 6% in the first year of war, 10% in the second year) and affecting both sexes, an increase in other forms of tuberculosis, mainly tuberculous meningitis, later in appearing but then rising proportionately more than the respiratory type (2 4% increase in the first year and 17 6% in the second year), and the large increase, as in the last war, of mortality from cerebrospinal fever, from which the recorded deaths in each year (mid-1939 to mid-1940, and mid-1940 to mid-1941) were for both sexes approximately four times the pre-war levels Relating deaths to notifications gives a fatality from this cause in 1940–41 of just over 20% for civilians and less than 10% for non-civilians—a great reduction on the old-time 50–60% On the other hand, despite the new therapy mortality from pneumonia shows no decline Like that of bronchitis the pneumonia-rate was doubtless affected by the severe winters and possibly by the effects of air-raid conditions on old people It is sad to see that, even excluding war casualties the usual annual low record for infant mortality is absent The first four quarters of the war show an average rise of 2 and the second four an average rise of 6½ in the rate per 1000 live births There has also been some increase in mortality from pernicious anæmia and a substantial rise in deaths from ulcer of the stomach and duodenum On the credit side there is a continuous and large decline in deaths from acute rheumatic fever and a distinct fall in mortality due to streptococcal and pyogenic infections—scarlet fever, erysipelas, ear and mastoid disease and appendicitis—and also exophthalmic goitre Maternal mortality likewise shows a substantial improvement and, more unexpectedly, the incidence of stillbirths has been relatively low Diabetes so far reveals little change, but in 1914–18 it did not decline until the third year of the war. It is interesting to note the distinct decline in suicide especially among women In the birth-rate there has been a sudden drop in the third quarter of 1940 and a continued low rate up to the end of the record with an 8–10% reduction in the second and third quarters of 1941 This is a relatively smaller decline than in the comparable period of the last war, when the birth-rate fell by 14% in the third quarter of 1915 and broadly continued with that rate of fall till the third quarter of 1916 A lower birth-rate is inevitable in war and the slightly lower probability of survival in infancy is therefore all the more unfortunate

Infant mortality and deaths from tuberculosis are looked upon as the best indices of the state of social well-being So far the increases in these rates are not spectacular, but they warn us to do our utmost to prevent the indirect toll which war exacts

PHANTOM LIMBS AND DISOWNED BODIES

DISORDERS of perception of the body have hitherto aroused little interest among British neurologists Head and Holmes[1] introduced the term "body scheme" to describe a plastic model reflecting the body shape and forming a standard by which changes in bodily outline and posture are measured Apart from this important contribution there has been nothing in English neurological literature to compare with the publications of Anton, Redlich, Bonvicini, Babinski, Potzl, Schilder, Lhermitte and Nielsen, to mention only a few Continental and American workers in this field This is all the more surprising because disordered awareness of a part of the body is by no means rare, and it often gives rise to symptoms which are strange enough to be noteworthy and which also raise questions of great psycho-physiological interest It is a welcome coincidence, therefore, that four British papers bearing on this subject should have been published almost simultaneously Riddoch[2] reminds us that knowledge of the phantom limb—the persistence in consciousness of a limb which has been removed—must be as old as survival from amputation, Lord Nelson considered that the phantom fingers of his amputated arm provided "a direct proof of the existence of the soul" The patient with a painless phantom limb often feels as if he can move it, especially its peripheral segments When a phantom limb is the site of pain, however, this capacity for hallucinatory movement is usually absent If the stump is deprived of postural sensibility, for example by surgical division of plexus or roots, the phantom feels as if detached from the stump when this is actively or passively moved It becomes, in Riddoch's words, "in part a foreign body which cannot be got rid off" In time a painless phantom slowly shortens and usually disappears by shrinking into the stump A painful phantom, on the other hand, survives as long as the pain persists Parts of the body other than limbs may survive in consciousness after their removal, such as the nose, breast and penis But in order that a phantom should be experienced it is not necessary that the limb should be removed If the sensory pathways conveying postural sensibility are interrupted at any point between a limb and the cerebral cortex, the patient may become aware of a phantom limb which seems to occupy quite a different position in space from that which vision shows to be the actual position, the illusory limb thus duplicating the real one These and other facts lead Riddoch to the conclusion that the recognition of body shape and changing posture is achieved through the activity of physiological mechanisms by means of which three main "plastic models" are constructed One is derived from postural sensibility, and this model is especially intimately related to voluntary movement The second, which is contributed by sensations of touch, pain and temperature, makes us aware of the surface of the body and its shape and the third is the product of vision A phantom limb is the outcome of the persistence of postural and surface models largely unchanged, in spite of the removal of the limb which they represent

---

[1] Head H and Holmes G *Brain*, 1911–12, 34, 102

[2] Riddoch, G *Ibid* 1941, 64 197

Spillane's[3] first patient and the patient reported by Parkes Weber[4] showed a defect which at first sight might be regarded as the opposite of a phantom limb Each denied his hemiplegia and behaved as though the left half of his body did not belong to him, Parkes Weber's patient denied his blindness also Barkman's[5] explanation of imperception of hemiplegia, however, would closely relate this symptom to the mode of production of a phantom limb, for he suggests that the patient no longer being aware of the left half of his body fills the gap with his memory of it as it was before his cerebral lesion When he describes it as normal he is thus describing a phantom half of the body, and he rejects the paralysed real limbs as belonging to someone else But in some cases the gap remains unfilled and the patient may then forget his left side altogether and behave as though it were absent Nielsen[6] has reported a patient with an amnesia for the left half of the body, who undressed only the right half and went to bed with the left half partially clothed, and dried only the right half after his bath He believes[7] that the essential lesion in such cases is one which prevents sensations from the left half of the body from reaching consciousness Faced with this sensory loss the patient may remember his anæsthetic limbs or forget them, he may have an illusion that they are absent but accept evidence to the contrary, or, despite all proofs, he may adhere to his belief, which then becomes a delusion It seems probable that imperception of hemiplegia is the outcome of a lesion of the optic thalamus, while amnesia for half the body or delusions of its absence depend on destruction of the thalamo-parietal peduncle or possibly the cortex of the supramarginal gyrus, and consequent loss of the postural and surface models of the opposite half of the body

Brain,[8] in a study of visual disorientation, points out that imperception of the body and imperception of external space are closely related, and may be present in the same patient He describes two main forms of visual disorientation, one in which the patient fails to recognise the spatial relations of objects seen in one half of space, the other a more profound disturbance in which he forgets or neglects one half of external space altogether, just as one half of the body may be forgotten Brain reports patients who felt as though one side of the body were on the other side, and who were unable to dress themselves because the disintegration of their body schemes impaired their perception of the structure of their clothes Pineas[9] has reported a case which constitutes a link between unawareness of the left half of the body and unawareness of the left half of space His patient failed to perceive not only the left half of his own body but also, though he was not hemianopic, the left half of external space and of the persons, objects and pictures which he saw

It will have been noted that in the cases of imperception of hemiplegia here mentioned the hemiplegia has always been on the left side imperception of right hemiplegia seems to be unknown in right-handed people, though Olsen and Ruby[10] have reported it in a left-handed patient As Nielsen has pointed out, the effect of a parietal lesion on the body scheme differs according to whether the right or left hemisphere is involved In a right-handed person a lesion of the left parietal lobe leads to the appearance of one or more of the components of Gerstmann's syndrome—finger agnosia, failure to discriminate right and left, acalculia and agraphia—while a lesion of the same area of the right hemisphere produces one of the forms of agnosia for the left half of the body already described The explanation of this difference is unknown, but it is paralleled in the sphere of visual perception, where imperception of one half of external space is probably similarly limited to the left half, and results from lesions of the right hemisphere only Clearly much remains to be learned about hemisphere dominance and its implications, and as Brain says the problem is complicated by the fact that in left-handedness there is not necessarily a wholesale shift of cerebral functions from one hemisphere to the other It has been shown that at least five principal functions behave independently of one another in respect of cerebral dominance, and a shift from left to right in the case of one does not necessarily imply a transfer of the others

We take our bodies so much for granted that we find it surprising that a man should forget the existence of half of his body without missing it, or maintain that his arm or leg belongs to someone else To be doubtful of one's own body might well seem evidence of insanity "I will not swear these are my hands let's see, I feel this pin prick," cries the distracted Lear, anticipating the neurologist And Descartes, the author of "Cogito, ergo sum," seems to have found the awareness of his body even better evidence of his existence than cogitation, for in his first "Meditation," he wrote "How could I deny that these hands and this body are mine, were it not perhaps that I compare myself to certain persons, devoid of sense   But they are mad, and I should not be any less insane were I to follow examples so extravagant " It is true that disorders of the body image possess an importance for psychiatry which is far from fully explored Hysterical paralysis and anæsthesia, depersonalisation, hypochondriasis, and the somatic delusions of melancholia, to mention only a few examples, all imply a disturbance of the body scheme or of ideas derived from it But the reported cases of imperception of the body have not been gathered from among the insane, and though to deny the existence of a part of the body may be to express a delusion it is quite compatible with rationality in most other respects These agnosias for the body and for its loss of function are primarily important to the study of the psychology and philosophy of perception They seem to show that from the perceptual standpoint the body is merely a portion of space which for various reasons we know more directly than we can know the rest, but that our knowledge of the body is not different in kind from our knowledge of the external world Science, hitherto, has been mainly concerned with enlarging our knowledge of the external world, and in dealing with the body it has sought to apply to it those principles and methods which have succeeded so well outside it Scientists, however, are beginning to wonder whether some " laws of nature " may not be, as Kant suggested, merely our ways of looking at things If so, we may find that disorders of the body image have something to teach us about our perception of external space and of those structures within it which, significantly, we call other bodies

---

[3] Spillane, J D *Lancet*, 1942, i, 42 [4] Weber, F P *Ibid*, p 44

[5] Barkman, A *Acta med scand* 1925, 62, 235

[6] Nielsen, J M *Arch Neurol Psychiat Chicago*, 1938 39, 536

[7] Nielsen, *Bull Los Angeles neur Soc* 1938, 3, 127

[8] Brain, W R *Brain*, 1941, 64, 244

[9] Pineas, H *Zschr ges Neurol Psychiat* 1931, 133, 180

[10] Olsen, C W and Ruby, C *Arch Neurol Psychiat*, *Chicago*, 1941, 46, 340

ANTIHORMONES

If animals are given repeated injections of certain hormone preparations, especially anterior pituitary extracts, they may become insensitive to the physiological action of the hormones COLLIP and ANDERSON[1] in 1934 demonstrated that this refractory state depends on the presence in the animals' serum of inhibitory substances which they called antihormones This finding opened an important field which has been entered enthusiastically by research workers in all parts of the world, but the main subject of controversy remains as it was in 1934 are antihormones antibodies in an immunological sense or are they antagonistic hormones ? Each side has its supporters, and experimental evidence has been brought forward to support both,[2] but the strongest evidence supports the view that antihormones are true antibodies Thus antihormones can be precipitated in the globulin fraction of the " antiserum,"[3] and their experimental formation in animals depends on an intact reticulo-endothelial system[4] whereas the state of the endocrine glands bears little or no relation to their formation Furthermore, like the antibodies evoked by animal blood or tissue antigens, antihormones evoked by hormone extracts during a short course of immunising injections have mostly shown well-marked species specificity In other words, the antihormone will inhibit the action of the hormone extract which has been used to stimulate its formation, but not similar extracts from different animal species

The final proof that antihormones are true antibodies will depend on the demonstration of a visible in-vitro reaction of the antihormone with the hormone (antigen) which has stimulated its formation The work of CLUTTON, HARINGTON and YUILL,[5] demonstrates that a substance physiologically active as a hormone (thyroxine), when artificially combined with an antigen, such as serum-globulin, can determine the specificity of the precipitating antibody which the artificial antigen evokes—i e , thyroxine in an artificially conjugated antigen can act as a haptene But hitherto it has been impossible to demonstrate an in-vitro reaction between a naturally occurring hormone and its antihormone It may be that the antihormone, as SULMAN[6] suggests, will prove to be an antibody of unusual type which does not react in the test-tube in a manner at present familiar to immunologists , or natural hormones may be coupled with carrier antigens in which the hormone itself is not the haptene In the latter case it is probable that the carrier antigen may be found not only in the endocrine gland from which a particular hormone extract is prepared but also in similarly prepared extracts from other tissues of the same animal species Such tissue extracts which in themselves contain no hormone could then be used to absorb antihormones from antisera Antibody absorption tests, however, present technical difficulties One is to prevent the antihormone from being carried down non-specifically in a precipitate in whose formation it has played no part Unless this difficulty is overcome the interpretation of results of absorption tests, especially when antihormone has been removed only partially, may be almost impossible Many experiments on these lines have been performed, usually with negative or inconclusive results, with a view to establishing that hormones exist in combination with carrier antigens SINGER[7] has shown that an extract from normal kidney prepared by a method identical with that used in the manufacture of an extract of pituitary gland containing follicle stimulating hormone (FSH) is capable of precipitating most of the antihormone from an antiserum to FSH His results require confirmation by more carefully controlled biological tests on groups of animals sufficiently large to give statistically significant results Many attempts have been made to establish the antibody nature of antihormones by correlating the power of reaction in vitro with biological inhibitory power of antihormone sera, but the results have often been contradictory, and so far no definite proof has been obtained STRANGEWAYS[8] and later BISCHOFF and LYONS[9] have, however, provided evidence which suggests that " antiprolactin " can be specifically precipitated from corresponding antihormone sera

Although the controversy over the nature of antihormones will probably require for its final settlement chemically and antigenically pure hormone preparations, much valuable work can be done with the extracts now available Immunological studies such as SINGER'S are useful in determining the antigenic composition of extracts from endocrine glands and their relationship to similar extracts of other organs from the same species But extreme care is needed in the interpretation of results, and we cannot regard an in-vitro antigen-antibody reaction as one in which the hormone itself is participating unless adequate biological tests are performed at the same time

---

[1] Collip J B and Anderson E M *Lancet* 1934 i 76
[2] See Collip Selye H and Thomson D L *Biol Rev* 1940 15, 1 Thomson *Physiol Rev* 1941 21 588
[3] Harington C R and Rowlands I W *Biochem J* 1937 31 2049
[4] Gordon A S Kleinberg W and Charipper H *Proc Soc exp Biol N Y* 1937 36 484
[5] Clutton, R F Harington and Yuill, M E *Biochem J* 1938 32 1119
[6] Sulman F *Arch int Pharmacodyn* 1939 61 319
[7] Singer F *Aust J exp Biol med Sci* 1941 19, 125
[8] Strangeways T S P *J Physiol* 1938 93 47P
[9] Bischoff H W and Lyons W R *Endocrinology*, 1939 25 17

Annotations

JUST THE PLACE FOR AN ACCIDENT

THE first annual report, covering nine months' activity, of the Birmingham Accident Hospital shows how well imagined the project was Accidents happen even more freely in war-time, when industry is working at pressure, than in peace-time, and the new hospital, in spite of being obliged to restrict its numbers, has experienced a wide and increasing demand for its services During the past two years, in the Birmingham area, industrial injuries needing hospital care have increased by 40%, the total now being well over 10,000 cases yearly Since last April—when the Birmingham United Hospital handed over the Queen's Hospital together with its equipment to become the new Accident Hospital—all the patients admitted have been injured either in industry or road accidents The hospital is also helping to maintain the health of the worker inside the factory Courses have been arranged to train industrial medical officers, industrial nurses and ambulance-room attendants, and a special mobile surgical unit, staffed by nurses and doctors from the hospital, is to be kept ready to go at once to the scene of an accident The unit will be housed in a six-wheeled coach which is now being built It is divided into three compartments, the main one being fitted up to deal with surgical emergencies, and is a gift of the Austin Motor Company Apart from this, industry has already contributed £10,000 to the hospital funds Inside the building 189 beds are in use, and a further 50 are reserved for air raid casualties The Ministry of Health has made a further 200 beds available at the EMS hospital at Hollymoor The outpatient department is being rebuilt and freshly equipped and should be complete by May Writing of plans for development, Mr William Gissane, director and surgeon-in chief, forecasts close contact with medical officers in industry over the treatment and rehabilitation of the injured An industrial liaison officer is to be appointed to the hospital staff to keep in touch with the accident centres of factories and their needs Meetings to discuss case-records will be held between industrial medical officers and the hospital staff, by which it is hoped to make advances in the prevention and treatment of accidents As a teaching centre for undergraduates and post-graduates the hospital will be linked closely with Birmingham University and with the United Hospital Rehabilitation is regarded as an essential part of treatment, and when fully developed this side of the work will give the patient opportunities for supervised physical activity, gymnastic exercises and swimming Occupational therapy will include weaving, carpentry and the other handicrafts which have proved engaging enough to keep the patient interested while his needy muscles are unconsciously exercised Recreational therapy includes team games, which can do much to overcome the boredom of the convalescent A vocational training centre may be added to the rehabilitation department, if it turns out to be needed, but, as Mr Gissane points out, a few vocational training centres scattered through the country could serve all the accident centres If vocational training becomes necessary in Birmingham, however, one large firm has already offered to cooperate in providing it No doubt a special accident hospital will serve admirably the needs of a highly industrialised community like Birmingham and will be an example to the rest of the country as to what can be done against custom But instead of adapting special hospitals for accidents in comparable industrial areas it will probably be more practicable and economical to open industrial departments in the existing teaching hospitals and to staff them with physicians and surgeons experienced in the health problems and conditions of industry In concentrating on industrial traumatic surgery there seems to be a danger of minimising the importance of the purely medical aspects of industrial medicine, which include the less dramatic—but equally crippling to the workers' earning power—occupational skin lesions, infections, poisonings by the metals and organic solvents, and states of mental and physical fatigue It has been said that one serious objection to special hospitals is that they deprive the teaching hospitals of valuable clinical material even if medical students have the right of entry into the special hospitals it is more convenient for everybody to have all teaching departments within the same close and curtilage These considerations apart, Birmingham is to be congratulated on the realisation of a novel idea

"MARCH" HÆMOGLOBINURIA

AFTER brisk or prolonged exercise some people pass urine containing free hæmoglobin This phenomenon was first noticed in soldiers after rapid marching and about 30 cases have now been described Several suggestions have been made to explain it, the most popular being local renal hæmorrhages Gilligan and Blumgart[1] have thoroughly investigated 3 cases and have shown that the mechanism of this form of hæmoglobinuria is exactly the same as in others[2]—i e, it is secondary to the presence of an increased amount of free hæmoglobin in the plasma But whereas the normal person does not pass hæmoglobin in the urine until the plasma hæmoglobin exceeds 100–140 mg per 100 c cm the leak point in these people was reached at a much lower level—about 25 mg per 100 c cm—and when hæmoglobin solution was injected intravenously their leak point was similarly low even at rest The total amount of blood lost was small, not exceeding the amount of red cells in 40 c cm of blood, and the destruction of this blood was entirely intravascular No evidence of chronic recurrent blood destruction or of impaired renal function was found Exercise was the prime factor causing this hæmoglobinuria, in one case a brisk walk produced it, in others fast runs were needed Gilligan and Blumgart agree with previous investigators that posture has something to do with this syndrome, but were not able to define clearly how its influence is exerted, in one of their patients the hæmoglobinuria could be prevented by wearing a plaster jacket which kept him in a moderately kyphotic position They incline to the view that a certain amount of excess destruction of red blood cells is a physiological accompaniment of brisk exercise The people who have hæmoglobinuria are abnormal in one, or possibly two, ways they have a low renal threshold for hæmoglobin, and relatively mild exercise provokes a significant destruction of red cells with consequent hæmoglobinæmia

The differential diagnosis of march hæmoglobinuria is important since some of the other paroxysmal hæmoglobinurias are serious The syphilitic type associated with chilling is detected by the positive Donath-Landsteiner and Wassermann reactions The nocturnal hæmoglobinuria (Marchiafava Micheli syndrome) is accompanied by a chronic hæmolytic anæmia and the red blood-cells can be shown to be hæmolysed by the patient's own serum in vitro This can most easily be done by suspending the patient's washed red cells in slightly acidified serum or heparinised plasma either from the patient or from a normal person of the same group, and incubating at 37° C. In myoglobinuria the urine is coloured red, the patient has chills, muscular weakness, stiffness and paralysis, the colour is due to the muscle pigment myoglobin. It has been suggested that march hæmoglobinuria might be really of this type, but spectrophotometric measurements have now enabled myoglobin and hæmoglobin in urine to be distinguished and there is no doubt that the red urine of exercise is due to hæmoglobin; true myoglobinuria is very rare. Another odd hæmoglobinuria, due to eating broad beans,[3] is not likely to occur here. The fact that ingestion of beetroot, and, among the drugs, amidopyrine, phenolphthalein and Prontosil Rubrum may also colour the urine red should be remembered. Hæmaturia is, of course, excluded by the microscopic examination for red cells in the urine.

---

[1] Gilligan D R and Blumgart, H L *Medicine, Baltimore*, 1941, 20 341

[2] See *Lancet*, 1941, i, 667

The condition appears to be benign and spontaneous recovery occurs in a few months or a few years, but since we do not know the effect of frequent passage of hæmoglobin on the kidney it seems advisable for the patient to avoid exercise that leads to hæmoglobinuria, and if this causes serious interference with ordinary life arrangements should be made to keep the urine alkaline during the periods when hæmoglobinuria might be expected. Many people of both sexes are now undergoing vigorous physical exercise under close observation, so that cases of this form of hæmoglobinuria are likely to be detected. All the cases so far described have been in men, usually soldiers or athletes, but since the condition is symptomless it is possible that this sex differentiation may be due to lack of opportunities for observation rather than a true sex limitation, perhaps the medical branch of the women's services will be able to settle the point.

DIAGNOSIS OF ADDISON'S DISEASE

It is often difficult to decide whether a patient has or has not got Addison's disease, and the clinician gets little help from his colleagues. Told about a case one's friends have the exasperating habit of producing others from their memory—much as conjurors do rabbits from hats—who were undoubtedly suffering from the disease and who proved it by dying suddenly, but who had remarkably few of the classical signs. The scope of the problem has been enlarged, as Robinson, Power and Kepler[4] point out, by the possibility of vague states of fatigue being treated unnecessarily and expensively with cortical preparations. They have devised a test for the borderline case which they claim is sensitive. It is based on the fact that people with Addison's disease do not respond to a draught of water with a normal diuresis. The reason for this is unknown, and it may not have any direct relationship to the absence of suprarenal hormones. It may be the result of the salt deficiency which is part of the addisonian syndrome, for normal men and animals suffer from the same disability when they have been made salt deficient by experimental means.[5] The test is carried out as follows. After 6 P.M. on the evening preceding the test, the patient takes nothing by mouth till the test begins on the following morning. Urine passed between 10.30 P.M. and 7.30 A.M. is collected and measured and the patient again empties his bladder at 8.30, and between then and 9.15 he is asked to drink 20 c.cm. of water per kilogramme of body-weight. From 9.30 to 12.30 the patient empties his bladder hourly and if the volume of any one of these specimens exceeds the volume passed during the night Addison's disease may be excluded. A second confirmatory test described by Robinson and his colleagues is based on the patient's blood chemistry and the analysis of urines passed during the test already described. The tests are simple and may turn out to be valuable to many besides their authors. The task of drinking 20 c.cm. of water per kilogramme of body-weight (2¼ pints for a 10 stone patient) seems on the face of it a difficult one for many patients with Addison's disease but in such severe cases the diagnosis would probably be obvious without tests.

MYALGIA AND SUBUNGUAL HÆMORRHAGE

Hæmorrhage under the nails of a rather characteristic "splinter" form, was first recorded in cases of trichiniasis by MacNaught[1] in 1939 and has since been noted by many observers. This hæmorrhage appears at the time the embryos are migrating, and is presumably due to an embryo acting as embolus in a vascular loop in the nail-bed. In this issue Dr. Houghton and Dr. Idris Jones describe a series of cases of myalgia occurring in late 1939, two of which showed hæmorrhages under the lunules of the nails, and in view of the recent increase in the incidence of trichiniasis these might be suspected of representing an early outbreak of that disease. But none of the patients showed an eosinophilia, and skin and precipitin tests to trichinella antigen carried out in April, 1941 were all negative, so a different explanation must be sought. The conditions in which subungual hæmorrhages have been recorded are broadly of two types—scurvy, purpura and blood dyscrasias form the first group, where the hæmorrhages may be diffuse or in the form of small petechiæ and the bleeding is due to increased permeability of vessel walls, the second comprises conditions such as infective endocarditis and trichiniasis where the hæmorrhages are embolic in origin. Pardo-Castello[2] in his monograph on diseases of the nails also mentions subungual hæmorrhages as having been seen in tetany and postencephalitic parkinsonism in old age, and very rarely in apparently healthy people and as a form of vicarious menstruation, but he peculiarly omits trichiniasis even in the 1941 edition. The hæmorrhages in the cases described by Houghton and Idris Jones seem to have been purpuric rather than embolic for other manifestations which may be purpuric were noted in two of the cases—epistaxis in one and bleeding from the cuticle of the nails in another. The ætiology of these new cases of myalgia is obscure, but the tentative suggestion is made that they are due to an unknown virus infection. None of them had the peculiar stiffness of the affected muscles, the gastro-intestinal symptoms, eosinophilia and swollen eyelids which are characteristic of trichiniasis, so that the two conditions could be distinguished apart from specific tests. The series has established that the association of myalgia with subungual hæmorrhages does not always mean trichiniasis.

A CHOLAGOGUE FROM CURCUMA

Many substances have been credited with a power to stimulate the flow of bile but probably few of these reputed cholagogues are true choleretics—that is, substances which increase the amount of bile secreted by the liver. It is difficult to determine whether a drug actually increases the amount of bile entering the gall-bladder. The rationale for the therapeutic employment of choleretics and hydrocholeretics (substances which increase the volume of the bile) is somewhat obscure but when such an action is desired bile itself or preparations of bile acids are the most effective agents. They have been used in different types of hepatic disorder—in diseases of the biliary tract, and, in conjunction with substances which will relax the sphincter of Oddi, to remove small calculi from the common bile-duct. The bile salts have been employed for outlining the bile ducts at operation and in cholecystography with tetriodophenolphthalein to accelerate the appearance of the gall-bladder shadow and hasten the removal of the residual contrast medium For such purposes the substance known as dehydrocholic acid, which is 3,7,12 triketocholanic acid, an oxidation product of cholic acid, may be given by mouth or its sodium salt may be injected intravenously when a rapid action is required Turmeric, the dried rhizome of *Curcuma domestica* Val (Fam Zingiberaceæ) and other species is better known as a constituent of curry powders and other condiments than as an item in the materia medica, but it has long been used by natives in India for the treatment of jaundice and there were references to its therapeutic use in 1748 and 1867, while from 1927 onward a number of papers appeared on the use of extracts of the plant or of curcumin, the yellow pigment it contains, for the treatment of disorders of the liver and biliary tract Oppenheimer[1] used sodium curcumin by mouth and intravenous injection and found that 10 c cm of a 5% solution produced rapid emptying of the gall-bladder which was clearly demonstrable on cholecystograms, the gall-bladder being considerably reduced in size in 10–20 minutes after injection This effect, however, was not constant in all cases, but he concluded from his observations and those of Henning and Künzel[2] that its action is choleretic, with emptying of the gall-bladder as a frequent effect in addition to the increased secretion of bile He used curcumin, chiefly given by mouth, with calcium cholate, in 67 patients suffering from subacute, recurrent or chronic cholecystitis, with relief of symptoms during the periods throughout which the patients were observed Perhaps in these days when eggs and fats are short curried dishes would provide an effective substitute for emptying the gall-bladder during cholecystography In addition to the yellow crystalline body curcumin, turmeric also contains about 5% of a volatile oil, and while the choleretic and cholagogue action of turmeric has been attributed by most investigators to the curcumin, Siebert[3] has shown by animal experiments that a like activity is possessed by *p*-tolylmethyl-carbinol, a constituent of the essential oil of *Curcuma domestica* He has used a synthetic derivative of this compound, the diethanolamine salt of *p*-tolylmethyl carbinol camphoric ester, by intramuscular injection in man and investigated by means of a duodenal tube the increase in secretion He found that the effect persisted for about an hour after injection and the average increase in secretion was 439% above the normal, the greatest rise observed being 679% Siebert claims from this investigation that this synthetic substance provides an exceptionally powerful cholagogue which is suitable for therapeutic use

---

[3] *Ibid* ii 164

[4] Robinson F J, Power M H and Kepler E J *Proc Mayo Clin* 1941, 16, 577

[5] Baldes, F J and Smirk F H *J Physiol* 1934 82 6, 2 McCance R A and Widdowson E M *Ibid* 1937 91 222, Wilkinson B M and McCance, *Quart J exp Physiol* 1940 30 249

[1] MacNaught J. B *Amer J trop Med* 1939 19 181

[2] Pardo-Castello V *Diseases of the Nails* Springfield 1941

PNEUMOMEDIASTINUM IN THE NEWBORN

AN alarming variety of respiratory failure in the newborn is described by Gumbiner and M M Cutler[4] of Chicago as due to the presence of air under pressure in the mediastinum The condition occurs during the first days of life and shows itself by respiratory and circulatory distress The respirations become rapid and shallow and cyanosis appears The peripheral veins, especially in the neck, are distended The heart sounds are feeble and distant and there may be superficial crackling sounds, synchronous with the heart beat Bulging of the præcordium may be seen and the cardiac dullness is obliterated Occasionally spontaneous rupture of the mediastinal "air block" takes place and a pneumothorax or subcutaneous emphysema may then develop The term "air block" was suggested by Macklin, whose views on this condition are quoted by Gumbiner and Cutler Experimental work has shown that overdistension of a portion of lung leads to rupture of the alveoli and escape of air along the vascular sheaths to the mediastinum The air in the mediastinum produces changes as soon as the pressure reaches zero The heart, great vessels, trachea, bronchi, lungs and vago sympathetic plexus all may be affected At first respirations become rapid and shallow Next comes a drop in blood-pressure, followed by pressure on the veins with a diminished flow of blood into the auricles The early dyspnœa is apparently of circulatory origin Pressure on the trachea, bronchi and lungs comes later and appears to be a relatively small factor The heart is displaced downwards and the percussion note becomes resonant and even tympanitic Thus pneumomediastinum may be suspected clinically but the diagnosis is definitely established by X ray examination The normal anterior-posterior view may show air just outside the borders of the mediastinum but the lateral view shows characteristic pools of air just below the shadow of the sternum In mild cases the air is absorbed and all that is required is the administration of oxygen if respiratory difficulty is present But if the encapsulated air begins to cause pressure symptoms, aspiration is indicated Gumbiner and Cutler report a case in which this was successfully carried out in an infant aged three days whose condition had become critical, with a lateral X-ray picture showing pneumomediastinum A needle was inserted into the third left interspace 1 cm from the sternal margin and directed medially A gush of air into the attached syringe moved the plunger back to the 6 c cm mark, indicating the release of air under pressure Within five minutes there was a drastic change in the infant's appearance, and within three days he was clinically normal with normal X-ray appearances in the chest Pneumomediastinum is probably not common, although after their dramatic therapeutic success Gumbiner and Cutler encountered 3 further cases in the succeeding eight months It is so obviously amenable to treatment that the possibility of its presence should be remembered when an infant develops acute respiratory distress in the early days of life

THE theme of a new report[1] by the industrial health research board of the Medical Research Council has truth not novelty to recommend it Time-keeping in factories, they find, could be improved by reasonable hours, better transport and catering facilities, and more attention to the domestic problems of married women Their findings are based on investigations covering 50 factories and 200,000 workers The usual facts about hours of work have become evident time lost by workers through sickness, injury and absence was usually low when hours were less than 60 a week, but increased as the hours increased up to 75 The board suggest that weekly hours should not exceed 60–65 for men and 55–60 for women, that holidays should be staggered, and that factory records should be kept more systematically

---

[1] H M Stationery Office 6*d*

DIETS FOR DYSPEPTICS —Many workers with peptic ulcers live alone or in rooms where the trouble necessary to provide their special dishes is not likely to be taken, as for example the sieving of vegetables, and it has been lately suggested in Edinburgh that British Restaurants should provide suitable meals for them at a reasonable cost Some hospital patients can afford to pay 1*s* 6*d* for a meal but a charge of 1*s* or 1*s* 2*d* would make the meals available to many more Provision for dyspeptics is important in war time, for only with proper *feeding can they hold their jobs*

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH —At a meeting of the college held on Feb 3, with Dr Charles McNeil, the president, in the chair, the following were introduced and took their seat as fellows Dr James Lockhart Cowan (Penicuik, Midlothian), Lieut Colonel Alexander Dron Stewart (Edinburgh), Dr Alexander Joe (Edinburgh) and Dr John Bishop Borthwick (Edinburgh)

---

[1] Oppenheimer, A *Lancet* 1937, i 619
[2] Henning N and Künzel O *Münch med Wschr* 1934, 81, 1611
[3] Siebert, W *Deutsch med Wschr* 1941 67, 679
[4] Gumbiner, B and Cutler, M M *J Amer med Ass* 1941, 117, 2050

MICRO-CHEMICAL METHODS OF BLOOD ANALYSIS

REVISED AND EXTENDED

E J King,
M A , PH D TORONTO
READER IN PATHOLOGICAL CHEMISTRY IN THE UNIVERSITY OF LONDON AT THE BRITISH POST-GRADUATE MEDICAL SCHOOL

G A D Haslewood,
M SC , PH D LOND
READER IN BIOCHEMISTRY IN THE UNIVERSITY (GUY'S) FORMERLY ASSISTANT IN PATHOLOGICAL CHEMISTRY AT THE POST-GRADUATE SCHOOL

G E Delory,
B SC LOND
TECHNICAL ASSISTANT IN PATHOLOGICAL CHEMISTRY AT THE SCHOOL

D Beall,
PH D TORONTO
ASSISTANT IN PATHOLOGICAL CHEMISTRY AT THE SCHOOL

A DESCRIPTION of procedures for micro-analysis of certain commonly determined blood constituents was given in a former communication (King et al 1937) Some of the procedures have since been modified, and micro-methods for other blood constituents have been investigated The improvements introduced are outlined here and directions are given for additional methods. The sections are numbered throughout to correspond with those in our previous paper

(A) PROCEDURES FOR WHOLE BLOOD

Sections I, II, III and VII are modifications of previously described procedures

I. *Urea* —A Klett violet-light filter is used for the colorimetric comparison (from Messrs Hearson)

II. *Non-protein nitrogen* —The blood is deproteinised with 0 3 c cm of 10% sodium tungstate and 0 3 c cm of $\frac{2}{3}$ N sulphuric acid instead of 0 6 c cm of trichloracetic acid

III. *Inorganic phosphate* —The reducing agent may be prepared fresh for use from a tablet containing the correct amounts of 1 2 4 aminonaphthol sulphonic acid, sodium sulphite and sodium metabisulphite A tablet is ground with 10 c cm of water, filtered, and the solution is ready for use (from Messrs Gallenkamp)

VII *Glucose* —The blood (0 2 c cm) is collected in a mixture of 3 2 c cm of 3% sodium sulphate and 0 3 c cm of 7% copper sulphate (copper prevents loss of sugar by glycolysis), and is deproteinised by adding 0 3 c cm of 10% sodium tungstate when ready for analysis

Colorimetric method for glucose (on 0 05 c cm blood) —See Haslewood and Strookman (1939)

VIII *Galactose* —See King and Aitken (1940)

IX Sulphonamides in Blood

Sulphanilamide appears in the blood in variable amount after administration Part of it is present in the free state and part in a conjugated form For therapeutic purposes it is usual to try to adjust the amount administered by mouth so as to maintain a level of 8–15 mg of the free sulphanilamide per 100 c cm of blood The total sulphanilamide (i e , free plus conjugated) is usually 20–50% more than the free

PRINCIPLE

The blood is deproteinised with trichloroacetic acid Sulphanilamide is estimated in the filtrate by means of the diazo reaction The sulphanilamide is diazotised with sodium nitrite, the excess nitrite is destroyed by ammonium sulphamate, and the diazonium compound is coupled with naphthyl ethylene diamine The pink colour produced is compared with that developed from a standard sulphanilamide solution treated in the same way The conjugated sulphanilamide must be released from its organic combination before it will react with the reagents This is accomplished by boiling the trichloroacetic acid filtrate with hydrochloric acid Determination of the sulphanilamide in the resultant solution gives the total sulphanilamide, free plus conjugated

The chemically related drugs, sulphapyridine and sulphathiazole, are determined in the same way

METHOD

This method is adapted from the procedure of Marshall (1939), 0 2 c cm of blood is added to 3 2 c cm of water or isotonic sodium sulphate 0 6 c cm of 25% trichloroacetic acid is added The mixture is vigorously shaken, and filtered or centrifuged, 2 c cm of the filtrate (≡ 0 1 c cm of blood) is transferred to a test-tube and 1 drop of sodium nitrite solution added The tube is shaken and left for 3 min , 1 c cm of ammonium sulphamate solution is added and the mixture left for 2 min with occasional shaking 2 c cm of naphthyl ethylene diamine solution is now added and the mixture shaken The coloured solution is compared with a standard prepared in the same way from 2 c cm of standard solution (≡ 0 004 mg sulphanilamide) The use of a yellow-green light filter (e g Ilford spectral yellow-green) facilitates the comparison

Total sulphanilamide is determined by heating 2 c cm of filtrate with 0 5 c cm of N hydrochloric acid in a 5 c cm volumetric flask in a boiling water-bath for 1 hour The cooled contents of the flask are then treated with sodium nitrite, &c as in the procedure for free sulphanilamide, and the volume adjusted to 5 c cm with water

CALCULATION

$$\begin{array}{c}\text{Blood sulphanilamide}\\ \text{(mg per 100 c cm}\\ \text{blood)}\end{array} \begin{cases} \dfrac{\text{Reading of standard}}{\text{Reading of test}} \times 0\ 004 \times \dfrac{100}{0\ 1} \\ \dfrac{\text{Reading of standard}}{\text{Reading of test}} \times 4 \end{cases}$$

If the colour of the test is more than twice as strong as that of the standard, the determination should be repeated with 1 c cm of filtrate plus 1 c cm of water

If sulphapyridine or sulphathiazole is determined by the above procedure, and with a sulphanilamide standard, the value obtained is multiplied by 1 4 to give the mg sulphapyridine or sulphathiazole per 100 c cm blood

SOLUTIONS

25% *trichloroacetic acid* —25 g of the acid dissolved in water and made up to 100 c cm

Sodium nitrite solution —0 5 g dissolved in 100 c cm of water This solution is the same as solution B in the bilirubin method

Ammonium sulphamate solution —0 5 g dissolved in water and made up to 100 c cm

Naphthyl ethylene diamine solution —0 5 g of N (1-naphthyl) ethylene diamine dihydrochloride in 100 c cm of water, stored in a brown bottle

Stock standard sulphanilamide (0 1 mg per c cm) —100 mg of sulphanilamide is dissolved in 1 litre of water

Standard solution (0 002 mg sulphanilamide per c cm) — 2 c cm of the stock standard, together with 15 c cm of the 25% trichloroacetic acid, is diluted to 100 c cm with water

(B) PROCEDURES FOR PLASMA

I. Plasma Proteins *

It has been shown by Campbell and Hanna (1937) that treatment of plasma with sodium sulphite, instead of sodium sulphate, solution enables the globulin fraction to be precipitated in 10 minutes (instead of 3 hours) and at room temperature (instead of at 37° C) This method modified for use with 0 2 c cm of plasma, has been found, with bloods containing normal and abnormal ratios of albumin and globulin, to give results almost identical with those obtained by the sodium sulphate procedure previously described

METHOD

(*a*) *Total protein* and (*b*) *fibrin* are estimated as in the previous method with the exception that 0 2 c cm of 50% sulphuric acid (approximately 18 N) is used for the digestion instead of 0 5 c cm of 30% (see N P N) If the highest accuracy is not necessary in the total protein estimation, the 0 2 c cm of diluted plasma may be digested with sulphuric acid, without the preliminary precipitation of the protein with zinc hydroxide The result obtained will be approximately 0 15% too high (0 15% protein corresponds to the average non-protein nitrogen equivalent of 24 mg per 100 c cm of normal plasma This simplification should only be used in cases where the N P N. is known not to be elevated

(c) " *Albumin* "—A drop of caprylic alcohol is added to a 5 c cm volumetric flask, 0 2 c cm of oxalated plasma is pipetted into the flask and the volume made to 5 c cm with sodium sulphite solution The flask is stoppered, well shaken, and allowed to stand at room temperature for 10 min The solution is filtered through a fine paper 0 2 c cm of the filtrate (≡ 0 008 c cm of plasma) is added to 4 c cm of water in a 15 c cm conical Pyrex centrifuge tube and this solution mixed with 0 1 c cm of zinc sulphate solution and 0 1 c cm of 0 5 N sodium hydroxide The tube is centrifuged and, when the supernatant liquid has been carefully decanted, inverted and allowed to drain on filter paper The precipitate is treated with 0 2 c cm of 50% sulphuric acid A piece of porous pot is added and the mixture gently boiled till charring occurs and white fumes appear To the cooled solution is added 1 drop of hydrogen peroxide (99–100 vol) and heating is continued for 3 min. After cooling, the clear colourless solution is mixed with 5 c cm of water, well mixed, and 3 c cm of Nessler's reagent is added The colour is compared with a standard made by adding 1 c cm of Nessler's reagent to a mixture of 2 c cm of water and 5 c cm of standard ammonium chloride solution (containing 0 01 mg of nitrogen per c cm.)

---

* Modification of previously described procedure

CALCULATION

$$\text{Albumin (g per 100 c cm of plasma)}\left\{\begin{array}{l} = \dfrac{\text{Reading of standard}}{\text{Reading of test}} \times 0\ 05 \times \dfrac{100}{0\ 008} \times \dfrac{6\ 25}{1000} \\ = \dfrac{\text{Reading of standard}}{\text{Reading of test}} \times 0\ 625 \times 6\ 25 \end{array}\right.$$

SOLUTIONS

Sodium sulphite solution —42 g of the salt $Na_2SO_3\ 7H_2O$ dissolved in water, and the volume made to 100 c cm

Zinc sulphate and *standard ammonium chloride* as in the method for blood urea

III Plasma Phosphatase †

The buffer substrate is divided into two solutions to ensure greater stability (a slow but appreciable hydrolysis of the phenyl phosphate takes place in the alkaline buffer) The reaction of the hydrolysis mixture (substrate, buffer and plasma) has been made slightly more alkaline (6 Na_2CO_3 4 $NaHCO_3$, instead of 5Na_2CO_3 5 $NaHCO_3$), bringing the final pH more nearly to the optimum The amount of hydrolysis is thereby somewhat increased and the values are brought closer to those obtained with the original method (King and Armstrong 1934), in which a veronal buffer was used The " diluted stock standard phenol " is eliminated, and the " standard phenol-solution-and-reagent " is prepared direct from the " stock standard phenol " The new standard-phenol-solution-and-reagent contains less Folin-Ciocalteau reagent than the former The concentration of the reagent in the standard is thus made more nearly equal to that in the test, from which a small proportion of the reagent originally added is lost through combination with the precipitated protein

METHOD

Test —In a conical centrifuge tube are placed 2 c cm of buffer and 2 c cm of substrate The tube is placed in a water-bath at 37° C for 3 min Without removal of the tube from the bath, exactly 0 2 c cm of plasma (which must be cell-free) is added and mixed The stoppered tube is allowed to remain in the bath for exactly 15 min At the end of this time 1 8 c cm of dilute Folin-Ciocalteau reagent is added and the mixture centrifuged or filtered

Control —In another tube are placed 2 c cm of buffer and 2 c cm of substrate, 0 2 c cm of plasma is added, and at once 1 8 c cm of dilute Folin-Ciocalteau reagent, and the mixture centrifuged or filtered

4 c cm of filtrate from the test and control solutions and 4 c cm of the standard phenol and reagent (≡ 0 04 mg phenol) are pipetted into test-tubes, 1 c cm of 20% sodium carbonate is added, and the tubes replaced in the 37° water-bath for 10 min to allow the colour to develop

SOLUTIONS

Buffer M/10 sodium carbonate bicarbonate (6 Na_2CO_3 4 $NaHCO_3$) —6 36 g anhydrous sodium carbonate and 3 36 g sodium bicarbonate are dissolved in distilled water and made to 1 litre

Substrate M/100 disodium phenyl phosphate —2 18 g dissolved in 1 litre of water The solution should be brought to the boil to destroy any organisms, cooled and preserved with a little chloroform

Standard phenol and reagent (1 mg phenol per 100 c cm) — 5 c cm of the stock standard phenol (100 mg per 100 c cm) is accurately measured into a 500 c cm volumetric flask, 100 c cm of dilute (1 3) Folin Ciocalteau reagent is added and water to the mark This solution will keep at least 6 months, if preserved in the ice chest

V Plasma Sodium

The sodium of the blood is concentrated in the plasma very little being found in the red cells In normal persons plasma sodium values lie between 325 and 350 mg per 100 c cm In acute cases of Addison's disease the amount is lowered, when values approaching 250 mg may be encountered, in chronic cases it may be only slightly depressed

PRINCIPLE

After precipitation of the plasma proteins by trichloro acetic acid the sodium in the filtrate is precipitated as sodium zinc uranyl acetate After washing, this precipitate is treated with potassium ferrocyanide and the resulting plum red colour (uranyl ferrocyanide) is compared with that produced by a standard sodium chloride solution which has been treated in a similar fashion

METHOD

This method is adapted from the procedure of Noyons (1939) To 0 5 c cm of serum or plasma are added 1 5 c cm of 7% trichloroacetic acid The mixture is shaken well and filtered after 5 min , 0 2 c cm of the filtrate (≡ 0 05 c cm plasma) is transferred to a centrifuge tube containing 1 c cm of absolute alcohol and 0 4 c cm of zinc uranyl acetate reagent The contents are mixed and kept in the ice-box overnight ‡, they are then centrifuged for 15 min The supernatant solution is decanted, the tube allowed to drain on a filter paper for 10 min and the lip dried, 5 c cm of absolute alcohol saturated with sodium zinc uranyl acetate is added, the contents are mixed, by rotating the tube, centrifuged for 15 min and drained as before The precipitate is then dissolved by adding 10 c cm of dilute acetic acid, 0 25 c cm of potassium ferrocyanide solution is added and after mixing the tube is allowed to stand in the dark for 5 min The coloured solution is compared with that produced from a standard sodium chloride solution, 0 2 c cm (≡ 0 15 mg Na) of which has been treated simultaneously in the same way as the deproteinised plasma (Colours must be read within 15 min or a clouding may occur)

CALCULATION

$$\text{Plasma sodium (mg per 100 c cm of plasma)}\left\{\begin{array}{l} = \dfrac{\text{Reading of standard}}{\text{Reading of unknown}} \times 0\ 15 \times \dfrac{100}{0\ 05} \\ = \dfrac{\text{Reading of standard}}{\text{Reading of unknown}} \times 300 \end{array}\right.$$

SOLUTIONS

Standard NaCl (containing 0 75 mg Na per c cm) —191 mg of analytical dry sodium chloride dissolved in 100 c cm in water in a volumetric flask

Trichloroacetic acid —7 g per 100 c cm in water

Zinc uranyl acetate reagent —20 g of uranyl acetate, $UO(CH_3\ COO)_2\ 2H_2O$, 60 g of zinc acetate, $Zn(CH_3COO)_2\ 2H_2O$, and 60 c cm of glacial acetic acid are added to 320 c cm of distilled water and warmed gently until dissolved After standing 24 hours the solution is filtered into a dark bottle and stored in the ice box The solution must be filtered immediately before use

Saturated alcoholic sodium zinc uranyl acetate —40 c cm of zinc uranyl acetate reagent are mixed with 50 c cm of 50% alcohol saturated with sodium chloride, 100 c cm of absolute alcohol is added, and, after standing in the ice box overnight, the supernatant solution is decanted The precipitate is washed several times with alcohol, drained, dried and then shaken with 500 c cm of absolute alcohol This is stored in the ice box and filtered immediately before use

Potassium ferrocyanide —20 g dissolved in water and made up to 100 c cm

Dilute acetic acid —0 5 c cm glacial acetic acid made up to 100 c cm with water

---

† Modification of previously described procedure

‡ It is not possible to obtain complete precipitation of the sodium zinc uranyl acetate in a short time A 2 hr precipitation may be used, however, although the results will be less accurate

VI. Serum Potassium

The serum of normal persons contains 16–20 mg of potassium per 100 c cm This is a very constant value. There is a rise in Addison's disease, a small rise during attacks of bronchial asthma and in advanced renal disease, and a fall in familial periodic paralysis during the attacks of paralysis

PRINCIPLE AND METHOD

The potassium is precipitated as cobalti-nitrite The precipitate is washed, dissolved in hot water, and an excess of choline hydrochloride and sodium ferrocyanide is added An emerald green colour develops immediately, the depth of which is proportional to the amount of cobaltous salt present, and hence to the amount of potassium

This method is adapted from the procedure of Jacobs and Hoffman (1931) 0 5 c cm of serum (or of standard potassium solution) is placed in a conical centrifuge tube graduated at 4 c cm , and 1 c cm of filtered Kramer and Tisdall's sodium cobalti-nitrite reagent is added slowly with constant shaking After 45 min 1 c cm of water is added, and the contents are mixed and centrifuged at moderate speed for 15 min The tube is then inverted and drained briefly on filter paper ; 2 c cm of water is added down the sides of the tube without disturbing the precipitate The tube is again centrifuged for 5 min , inverted and thoroughly drained The precipitate is washed with 5 c cm of 70% alcohol, and centrifuged and drained The alcohol is blown into the tube so as to agitate the precipitate 1 c cm of water is added and the tube placed in a boiling water-bath until dissolution is complete

In another graduated centrifuge tube is placed 1 c cm of the standard cobalt solution (0 1 mg potassium) ; 0 5 c cm of choline chloride solution and 0 5 c cm. of sodium ferrocyanide solution are added in that order to each tube and the volume made to 4 c cm The colours can be immediately compared in a colorimeter and are stable for several hours (Orange or red light filter)

CALCULATION

$$\begin{array}{c}\text{Serum}\\ \text{potassium}\\ \text{(mg per 100}\\ \text{c cm serum)}\end{array} \left\{ \begin{array}{l} = \dfrac{\text{Reading of standard}}{\text{Reading of test}} \times 0\ 1 \times \dfrac{100}{0\ 5} \\[2ex] = \dfrac{\text{Reading of standard}}{\text{Reading of test}} \times 20 \end{array} \right.$$

SOLUTIONS

Sodium cobalti-nitrite reagent (Kramer and Tisdall 1921) — Solution A · 25 g of cobaltous nitrate crystals is dissolved in 50 c cm of water, and to this solution is added 12 5 c cm of glacial acetic acid Solution B 120 g of sodium nitrite (potassium free) is dissolved in 180 c cm of water, giving a total volume of about 220 c cm To the whole of A is added 210 c cm of B Nitric oxide is evolved Air is drawn through the solution till all the gas has passed off The reagent thus prepared is best kept in the ice chest and should be filtered each time before use, it keeps for a month

Standard potassium solution —0 2228 g of potassium sulphate (K_2SO_4) is dissolved in 500 c cm of water, giving a solution equivalent to 0 2 mg K per c cm

Standard cobalt solution (≡ 0 1 mg potassium per c cm) — 0 506 g of cobalt ammonium sulphate is dissolved in a litre of water Any cobalt salt may be used but this is the easiest to weigh The solution should be standardised against the standard potassium before use, but when once made is stable

Choline chloride (1 g per 100 c cm)

Sodium ferrocyanide (2 g per 100 c cm)

Because there are only 16–20 mg potassium per 100 c cm of serum, and blood corpuscles contain about 300 mg per 100 c cm there must obviously be no hæmolysis Also, the serum must be separated from the clot soon after the blood is taken, otherwise potassium will diffuse out into the serum Separation of serum 1–2 hours after taking the blood is sufficient

REFERENCES

Bratton A C and Marshall E K (1939) *J biol Chem* 128 537
Campbell, W R and Hanna, M I (1937) *Ibid* 119 15
Haslewood G A D , Strookman T A (1939) *Biochem J* 33 920
Jacobs H R D and Hoffman W S (1931) *J biol Chem.* 93, 685
King, E J and Aitken R S (1940) *Lancet* ii 543
— Armstrong A R (1934) *Canad med Ass J* 31 376
— Haslewood and Delory G F (1937) *Lancet* i 886
Noyons E C (1939) *Pharm Weekbl* 76, 307

In England Now

A Running Commentary by Peripatetic Correspondents

GOING on leave last week provided a variety of new experiences, physical and emotional in which the feeling of a very old Rip Van Winkle returning to a rejuvenated homeland were combined with those of a very young Rip Van Winkle re-entering an impossibly antique land The journey offered the first excitement Time not always being on our side, I decided to go by air, and it was not till we were approaching the aerodrome on a bleak, gusty morning that I began to doubt the wisdom of my choice to hope that the trip would be cancelled and to yearn for a priority passenger to come and claim my seat Both these emotions vanished when it appeared that I was not going to be allowed to find the way in I could see the aerodrome I could even see the planes dotted on the landing field like camouflaged ducks ; but the entrance was something too secret to be divulged After charging up several alley ways that debouched either into chicken runs or mysterious flat places where builder's mates seemed to be muttering incantations over a pile of cement powder, I landed in a yard at the extreme end of which I saw a sentry box full of sentry He was obviously torn between the conviction that he should not be answering my questions and a feeling that he would never get rid of me unless he did. It appeared from his uneasy gruntings that the only alley I had rejected, because it headed directly into the front parlour of a private house, was the correct one By this time I could hear the plane warming up, and frantic at the thought of forfeiting my fare money I tore across what seemed to be a private garden leapt a decaying flower bed, and whirled round the side of the house into the arms of six or seven surprised mechanics A tired-looking clerk emerged from nowhere and shepherded me wearily back into the house, now disclosed as an office where I was received by an amiable but shrewd policeman, who asked me to examine the list on the wall, and then declare anything that might be mentioned on it I looked, my eyes glued to the two items that seemed to be waving their hands to attract his attention Honesty fought with guile " Well I've got nothing in my bag but I have——" I paused "My lunch is—well not quite above suspicion ' He looked at the small parcel, he looked at me , two minutes later I was forcing myself into the back seat, the mail was thrown in, the door banged, and we were off Rocking like a car on a badly-pot-holed road we bumped and swayed and as our eyrie was completely blacked out waited to tell by sensation when we took the upper air My main impression as the humming of the engines swelled was that the whole affair had an unpleasant resemblance to going off under gas . the tempo had only to quicken a little more, the swaying to increase to nausea point and oblivion would follow—or would it ? I looked at the brown paper objects tucked into the back of the next seat, identified them as bags put there for a sinister purpose, and wondered if I were going to disgrace the passenger list At that moment the plane seemed to straighten out, the pilot changed into top, and the bumping ceased and did not recur till we slid on to the tarmac at our destination My first plane journey was over, deliciously uneventful gratifyingly dull The rest of the passengers were hardened old travellers who snored and gurgled in unison with the plane The sole human high light was the wireless operator who sat in front of his switchboard, his fingers intent with his instruments, his eyes equally intent on " Gone with the Wind "

The return journey was just as undramatic, if one excludes the famous gossip writer who sat directly behind me and who I hoped was taking notes on the natty cut of my new raincoat Stepping out of the plane I made a dash for the shelter of the private-house-c̄-office that had so baffled me a week ago As I cantered up the garden path, my friend the policeman was hanging about near the scullery door He shambled out and in a curiously furtive voice muttered something in my ear "My identity card, did you say ? " I tried helpfully He nodded, his eyes fixed anxiously on a group of people passing close by , then calculating that they were safely out of earshot he laid a restraining hand on my arm 'It don't matter about the card ' he said hurriedly, "it s just—if you wouldn't mind—you see—er—I have to ask Well the fact is I must know your age, Madam Very unpleasant with ladies," he mumbled, pink with embarrassment, and avoiding my eye Relieved to find that he was not going to reopen the subject of my lunch packet, I was only too pleased to tell him

* * *

The train journey, which was long, tedious and starred with many changes, offered a cross-section of England at war In my various spells in different carriages, each of which was like a fresh world, the topics were new but the conversational treatment and the focus of interest were exactly the same as in peace-time—and no doubt differed little in essentials from those of the Stone Age The woman with the squint and the droning voice, who recited deeds of valour performed by her son in the Navy, had exactly the same effect on her companion as if they were discussing a friend's charring appointment This took the form of astonished repetition of the last words of her companion's sentences " O' corse George says these noo guns they've got can fire miles and miles " " Miles and miles," echoed her friend " Yus, and on his larst patrol before 'e come on leave 'e sez they saw two German supply ships wot 'ad scuttled therselves " " Scuttled therselves ? " " Oh yus, 'e sez that's very usual, and if there's U-boats about they don't wait to pick up survivers, they just 'ops it " " Hops it ! " " Yus, seems 'orrible dun it, and yet when I thinks of the mess them Jerries made of my 'ome—well it makes you mad " " That's right, it does make you mad " " Makes you wonder where its going to end dun it ? " " That's it, where's it going to end ? " They were still at it when I left them at Crewe

The next two changes were uneventful—a couple of dowagers mewing for blood, a gloriously healthy looking W R N S , a tired business man, and a few schoolboys The third change was a goldmine , in the two far corner seats were a couple of young mothers, one with a baby in arms, the other with a small boy of about three After eighteen months in the country they were taking their offspring back in time for the winter blitz I regretted the possible loss of the baby, but after two hours I began to think that a bomb might improve young Ralphie " Proper little tartar, 'e is," his mother confided to us as she ineffectually smacked the grubby little hands that fiddled with the blackout, the carriage doors, and the belongings of his immediate neighbours " I can't do anything with him," she added with sombre pride " Wot did you say, Ducky ? " " I sez everyone's very spiteful," whined Ralphie, " policemen an neverybody Not letting me look out 'Cos it's pitch black out innit, Mum ? When I peeped out then I could see it was pitch black It'll be pitch black when we get home won't it, Mum Pitch black pitch black " His yammerings were drowned by the breathless life story of the little woman opposite She looked about fifty, was in fact fifty, and had with her a granddaughter of about four years old—weckling of a family of brothers the youngest of whom was thirty-one By dint of her unceasing gabble she collected the attention of the whole company , and to the embarrassment of a cherubic young sergeant, treated us to an outline of her family's obstetric idiosyncrasies The other two women and the hard-bitten sailor sitting next to me listened avidly The background of the story was topical with bombs, evacuation and suchlike , but what held her hearers' attention was the " youman ellimink "—the worn obstetric track that never fails to grip the attention of the audience Having given the subject a complete overhaul, she left it reluctantly for the small child sitting beside her " Bin bombed out six times, she as, pore little mite," she remarked with naive enjoyment , " larst time was a big one " " 'Oo bombed yer 'ome, Duck ? " she inquired suddenly " That's right, 'itler Sharp as a needle she is What did 'itler do to our 'ouse, duck ? " " Bombed it," the child squeaked cheerfully " That's right, duck She remembers all about it," she lowered her voice " Mind you she's being tret for her nerves Pore little blighter Corse one can't expect not to be affected, can you ? My ears now, they always 'ave discharged but since the big bang I gets blood coming away That's not right you know——" Encouraged by our absorbed attention she showed us her scarred hand , gave us a fascinating glimpse of her bad knee, hinted at other interesting lacerations, but lacking definite encouragement—except from the sailor—regretfully abandoned the idea of displaying them to us

By this time the ice had been thoroughly broken, the sailor was exchanging snapshots with the pretty young woman with the baby, and confiding to her that he never ought to have got married on account of his itching feet These I gathered were a spiritual rather than a physical complaint In the meantime the sergeant had managed to prise the late obstetrical bloomer out of the conversation and told us that he was on his way to collect an absentee His kindly soul was torn between dislike of his job and the knowledge that if his charge escaped he himself would automatically become a private But he disliked the thought of using handcuffs " What would you do ? " he demanded, eyeing me wistfully " Handcuff him," I answered promptly He accepted this for the time being, but the last words I heard as I left the carriage and climbed out on to the busy platform were the flutings of the youngest mother " Now don't be too 'ard on that pore man I expect 'e's got a wife somewhere " " That's right," chipped in the elderly multip, " I know a woman whose husband deserted fower times in the last war Never a bit of good to 'er 'e wasn't, and she idolised 'im—idolised 'im Wouldn't 'ave 'im near the 'ouse—but idolised "

* * *

Sitting on our new operating-table the other day was an outpatient, a broad-shouldered little man He had dark curly hair, and his brown eyes mirrored at the moment that feeling common to most people when they are about to have a tooth out Soon the brief operation was over , our anæsthetist put away the gas apparatus and a smiling patient was saying thank you in voluble Italian. Presently he went his way, back to the Prisoner of War Camp, a tall young British soldier with fixed bayonet escorting him politely Our operating-table is a marvel It is as full of tricks as a conjuror's bag turn a wheel and press a lever and you have a dental chair—a reverse turn and you are ready for the Trendelenburg position It accommodates all our specialists, whose procedures sometimes require their patients to adopt acrobatic attitudes in the surgical arena It was not like this until recently In the past we had to do our best with a fixed appliance—a table with no tricks It was too tall for A, too short for B Our E N T Surgeon struck, and so for him we dug out a relic which did possess a limited range of movement We made several abortive efforts to improve the situation , but official ears were closed to all importunities and there seemed nothing for it but to make the best of the ration tables and listen to the grumbles Then one day the Luftwaffe butted in, and later we received a convoy of air-raid casualties, among them a citizen of the U S A who had many friends There was quite a conspiracy to steal him away from us almost before he arrived, but he decided that he wanted the rest and nursing that we were offering, and he stayed until he was well His circle of friends had grown even larger before he departed, and we had certainly gained a benefactor Thanks to him the American Red Cross was approached and a note arrived one day saying that an operating-table was to be supplied to the hospital Some weeks passed and then one morning a packing-case arrived Its size caused dismay, and when I unpacked it my fears were confirmed Revealed stood a " fixed appliance " of all too familiar a type

Sadly I went back to my office to look at the morning's mail, and as I read an official letter a gleam of hope returned I was instructed to return operating-table as per schedule XYZ/100/200/890 to store ! Old birds are not to be caught with chaff , I did nothing for a day or two till another letter arrived saying that an operating table was on the way Then I sent back the mistake and waited We unpacked the huge crate which arrived at last and revealed to our wondering eyes a shining stainless-steel dream-come-true As one enthusiast said, it would almost give the snuff and do the operation itself Here are warm thanks to our friends across the Atlantic We have had many tools from them to help us in our job, but the best bundle of all contained our table

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS M.P

THIS week a deputation of M P.s is seeing Mr Ernest Brown the Minister of Health, on the Government proposal to set up a committee to inquire into the conditions of the A T S and other women's services, and it is expected that some women M P s will be added to "the four young men," Sir Edward Grigg Captain H H. Balfour, Mr R Assheton and Sir Victor Warrender But it is a curious commentary on parliamentary methods that no medical M.P s men or women, were proposed in the first instance The questions to be considered—billets, camp accommodation, clothing and equipment—are all of the kind dealt with by the hygiene branch of the medical services The complaints, in so far as they are justified, depend on the internal organisation of the services themselves and have been forcibly brought to the notice of ministers by many M P s as the result of complaints which they have received The large expansion of the women's services which began last summer is the cause of the trouble

* * *

In a written answer, to which of course supplementary questions may not be put, to a question by Sir Leonard Lyle on the staffing of E M S hospitals, Miss Horsbrugh parliamentary secretary to the Ministry of Health, said that "the allocation of the available man-power between military and civilian services is considered by the Medical Personnel (Priority) Committee presided over by the Parliamentary Under-Secretary for the Dominions and the number of doctors called up is based on the advice of that committee" This refers to the Shakespeare Committee which was appointed as a fact-finding body. and had as members representatives of the three services Dr G C Anderson secretary of the Central Medical War Committee, also attended its deliberations The Minister of Health lately issued an instruction that E M S hospitals were to consider their "establishments" in the military sense of the word, but that they were to do it not for individual hospitals but for groups There has recently been in progress a grouping of all E M S hospitals in the country to provide the necessary link between them and the services, for purposes of administration affecting service personnel It is presumably on the basis of this grouping that proposals fixing the numbers of doctors attached to E M S hospitals will be brought forward But it is doubtful if the best machinery to carry out these detail changes is a fact-finding committee appointed to make a general survey and lay down a general policy

The Medical Parliamentary Committee considered this matter some time ago and discussed a project by which the three medical heads of the Navy, Army and Air Force would be constituted a committee with the addition of the director-general of the E M S, the chief medical officers of the Ministry of Health, a representative of the Central Medical War Committee and a representative of the general practitioners of the country appointed by the British Medical Association Such a body would have all the information as to the needs of the Services and the E M S at their disposal, while the representatives of the Ministry of Health and of the general practitioners would put forward the needs of the civilian population.

* * *

The hygienic conditions under which munition work and all war production is carried on is another aspect of the medical man-power situation to which little attention has been given *There is for instance only one medical* inspector of mines and the Secretary for Mines answering Dr H B Morgan regretted that "it has not been possible under war conditions" to complete the examination of the report of the Safety in Coal Mines Royal Commission This was also a "written reply" But doing nothing about urgent matters in war-time hinders production and since all mines have some official and semi official agreements with doctors to attend to the workers in illness and accident it should be possible to arrange something Mr F Messer brought the same question forward when he asked Mr Bevin 'how many doctors have been appointed into industry under the Factories (Medical Welfare) Order 1940?' The reply was that whole-time doctors have increased by about 100 and *part-time doctors by about 400 These appointments* added to the few which existed before cover only a small part of the field The bulk of productive industry in this country is carried on in small establishments, many do not employ more than 25 people and there are few really big organisations What is needed in war-time is not any elaborate inspection but the general hygienic supervision of conditions analogous to the work of the hygiene branch of the R A.M C, which could *be done by general practitioners coöperating with the* local medical officers of health

* * *

The debates in the House last week were not exciting but parliamentarily useful *In the debate on Offices* of Profit under the Crown the question of what does and what does not disqualify any person from sitting as an M P. was considered Dr Haden Guest stressed the desirability of defining the "office of profit" so as not to debar members of the scientific professions, including medicine, from becoming M P s With the growing recognition of the importance of the social relations of science, these people were among those best qualified *to serve the state in Parliament, but if the* tendency towards Government service extended, as was very probable, most of the scientific professions would be excluded Prof. A V Hill in a question drew attention to the same point when he urged the Government to arrange for close collaboration with the scientists of India.

* * *

One of the institutions of the House is the Ballot for Notices of Motions *to be moved when supply is debated* Mr H McNeil had the luck to draw second place for a motion on hospital administration and it is his intention to cover the field of Scotland and England and Wales

FROM THE PRESS GALLERY

Government Grants for Science

THE Financial Secretary to the Treasury, on Feb 4, in introducing a supplementary estimate for £69 000 for grants in aid of scientific investigation said that the Government had decided to give a new and independent status to the Agricultural Research Council and bring it up to the status of the Department of Scientific and Industrial Research *and the Medical Research Council* He did not know whether any of the money provided in this supplementary estimate was going directly to the agricultural colleges, but the grants were largely for work done by agents of the colleges, for instance the Schools of Agriculture and Animal Pathology at Cambridge, the Institute of Animal Parasitology and grants to Rothamsted Reading University and many other institutions On another supplementary vote of £255,535, including grants for agricultural research, eradication of animal diseases and the improvement of breeding Mr R S Hudson, Minister of Agriculture, explained that an item of £133,000 was mainly accounted for by the outbreak of foot-and-mouth disease

War-time Nurseries

Mr KENNETH LINDSAY who raised the question of war-time nurseries after the adjournment on Feb 5 said he felt we should all work, however difficult it may be now, towards a *single joint authority* for all children under five and over five. He thought the major responsibility should lie with those who are responsible for the whole growth of children and not for one particular aspect of children—their health Mr ERNEST BROWN who replied said there was no difference between the President of the Board of Education and himself or the Minister of Labour and himself, on this matter Each of them had his own function, and they all meant to do two things—first to increase effective child care, and secondly to have regard to the immense problems resulting from the increasing demand for married women to take their part in the industrial war effort Considerable progress had been made, not merely with war-time nurseries but also with nursery classes The questions remaining to be solved were nearly all problems of labour and materials

There were 360 residential nurseries in the reception areas, all having in them children under five, and at the end of January there were 276 war-time nurseries in operation, 374 more approved and 257 more projected, making a total of 907 compared with 457 at the end of September He thought they would have a further 100 in operation during February, and probably 150 in March.

QUESTION TIME

Medical Inspector of Mines

Dr H B **MORGAN** asked the Secretary for Mines why there was only one medical inspector of mines, who also acted as medical adviser to the Mines Department and, whether, having regard to the number of mines in this country, the number of miners employed, the heavy incidence of accidents and industrial disease and the need for medical supervision and advice, his department would consider the immediate advisability of appointing at least four more medical inspectors —Mr **DAVID GRENFELL** replied The Royal Commission on Safety in Coal Mines made certain recommendations in regard to medical and allied services, which would involve some increase in the medical inspectorate Those and many other recommendations of the commission, which were accepted in principle by the Government, were under consideration as a whole when the war broke out I regret that it has not been possible under war conditions to complete our examination of the wide field covered by the Royal Commission's report

Doctors for Industry

Mr **MESSER** asked the Minister of Labour how many doctors had been appointed into industry under the Factories (Medical and Welfare) Order, 1940, what method of appointment was there to ensure the appointment of the most suitable candidates, and whether there was any coordination of this type of industrial medical work —Mr **ERNEST BEVIN** replied Since the making of the Factories (Medical and Welfare) Order 1940 the numbers of whole time and part time works doctors have increased by about 100 and 400 respectively, and it has not so far been necessary to exercise the powers given by the order to give directions for such appointments to be made It is for the employer to select the doctor but the arrangements have to satisfy the inspector of factories, and while in a very few cases the appointment has proved unsatisfactory and the doctor has been relieved of his post, I am advised that generally spea[illegible] the doctors appointed are carrying out the work well and that no complaint from workmen's organisations regarding any of the appointments has reached the senior medical inspector of factories There is substantial coordination of the work with outside health services, and the importance of this is stressed in departmental advice and otherwise

Medical Referees

In 1940 the number of appeals under section 43 (1) (f) of the Workmen's Compensation Act was 3119, of which 2430 were in respect of dermatitis The number of cases in which the examining surgeon's decision was confirmed was 1737 and 1319 respectively (Mr **HERBERT MORRISON** replying to Dr **MORGAN**)

Dr **MORGAN** Is the Home Secretary satisfied with the present arrangements with regard to medical referee decision in cases of industrial disease claims for workmen's compensation, is he aware of the injustice of the present one man final decision, often by a medical referee inexpert in the particular disease, and what steps is he proposing to take now to remedy the present system which is unjust to workmen claimants ?—Mr **O PEAKE** replied The Minister is well aware of the objections taken to the procedure prescribed by the present acts for determining medical issues in these cases, and recognises that this is one of the questions to be reviewed in connexion with any revision of the Workmen's Compensation system There are already a considerable number of specialist medical referees appointed to deal with the chief industrial diseases and, so far as present circumstances permit, steps have been taken, as recommended by the Stewart committee, to appoint additional referees for cases of dermatitis I would add that there are arrangements for enabling any medical referee who experiences difficulty in any case to obtain special assistance

Medical Man-power

Sir **LEONARD LYLE** asked the Minister of Health how it was proposed in case of need to staff the emergency hospitals with medical men, and whether, in view of possible enemy action and the outbreak of an epidemic, he would, in the interests of the civilian population, refrain from permanently calling up any more doctors —Miss **F HORSBRUGH** replied Emergency hospitals are provided with medical staff to meet such needs as can be immediately foreseen Any exceptional pressure on a hospital would be met by transfers from other hospitals under plans worked out in advance, by calling on available practitioners whose names have been placed on a rota for that purpose or by cooperation with Service medical establishments, or by a combination of such methods The allocation of the available medical man power between military and civilian services is considered by the Medical Personnel (Priority) Committee presided over by Mr Shakespeare, and the number of doctors called up is based on the advice of that committee

Sir **L LYLE** Has the Minister's attention been called to the number of idle doctors in uniform and the shortage of medical men in civil life, and would he see that the fighting forces provided, where possible, some measure of interworking between their respective medical men so as to simplify and accelerate medical attention and liberate numbers of such medical men, after a brief period of attachment to their units, to enable them to familiarise themselves with their prospective duties, on the understanding that should any sudden emergency arise they would at once be recalled to their posts ?—Mr **E BROWN** All practicable steps to secure the economical use of doctors in H M Forces and in civilian services are being examined by the Shakespeare committee Further cooperation between the medical branches of the three Services has already been secured in accordance with the recommendations of this committee and of the Robinson committee, thus reducing, without any loss of efficiency in the Services, the number of doctors that would otherwise have been required A system of releasing doctors from the Services to civilian practice, where there are special reasons for this course, is already in operation

Sir **L LYLE** Is there not a great danger to the civil population, and therefore to the war effort, if the present methods are persisted in, and will the Minister make a representation to the War Office ?—Mr **BROWN** This work is under the chairmanship of Mr Shakespeare and a most powerful committee —Dr **EDITH SUMMERSKILL** In spite of the Minister's reassurance, is he aware that a number of doctors are doing clerical work who might be released for clinical work ?—Mr **MESSER** later asked if the Minister was aware that some factories are depleted entirely of their medical staffs One factory employing 6000 people had no medical officer

Medical Evidence in Pensions Cases

Mr **RHYS DAVIES** asked the Minister of Pensions whether he would reconsider his attitude towards claims for pensions *in cases where medical evidence did not support* the view that the ailment from which the claimant was suffering was either attributable to or aggravated by war service, especially in view of the fact that it was not possible for any medical man, in the nature of neurosis cases, to provide his department with either positive or negative proof of attributability or aggravation —Sir **W WOMERSLEY** replied The war pensions provisions for members of the Forces do not permit of an award of pension for disablement which is neither attributable to nor aggravated by war service Successive Governments have maintained this principle as the only sound basis for such pensions, and I can hold out no hope of a departure from it The question of connexion with service in an individual case is one on which my medical officers are well qualified by their long experience to give me advice, and they give full consideration to all relevant factors, including the nature of the disabling condition as well as the service and medical history of the claimant In neurosis cases I am acting on the advice of a conference of medical experts presided over by Lord Horder

Mr **G BUCHANAN** Is the Minister aware that in the last war persons knew the case against them and were supplied with all the facts Laymen had a point of view as well as medical men on these matters and would not the Minister give a fair hearing to the claimant before a decision was reached ?

Sir **W WOMERSLEY** In every case the claimant's representatives are allowed to put their evidence before the medical experts and get a fair hearing The claimant's local panel doctor may put a case forward and it will be considered He assured the House these medical experts did their job well —Mr **DAVIES** expressed himself dissatisfied with the Minister's reply and gave notice that he would raise the matter again

Sir W Womersley informed Sir Smedley Crooke that since the beginning of the war 96 pension claims had arisen which were considered to require reference to an independent medical expert on the ground of serious doubt or difficulty on the medical evidence In 38 of these cases the claim arose in respect of death. Of the 58 claimants in respect of disablement the independent expert, who had unfettered discretion in the matter, decided to examine 8 Personal examination was not as a rule, considered necessary when there was no difference of opinion as to diagnosis

Our Daily Bread

Replying to a question by Sir E Graham-Little Major Lloyd George said calcium was not at present being added to any white flour, but the Minister of Food hoped to make an early statement on the matter

Synthetic Vitamin B_1

In answer to a further question he added that the amount of synthetic vitamin B_1 being added to white flour raises its B_1 content to about that of national wheatmeal The addition of the vitamin is carefully controlled and constantly checked so that any variations in the level of intake of vitamin B_1 due to different levels of bread consumption applies equally to both types of bread. There is no possibility whatever of any harmful effects from the vitamin B_1 at any level of bread consumption in either fortified white bread or national wheatmeal bread.

Gingivitis

There has been a considerable amount of infective gingivitis among the services and some cases among the civilian population. The evidence that this condition is due to dietary deficiencies is far from convincing and there is some reason to think that it is purely infective (The Minister of Health replying to Sir E. Graham-Little.)

Exchange of Statistics

Sir Francis Fremantle asked the Secretary of State for Foreign Affairs if he would arrange a systematic exchange of information as to the prevalence of typhus and other infectious diseases, both civil and military, with the Soviet government —Mr A Eden replied I will endeavour to arrange such an exchange of information.

Infectious Disease in England and Wales

WEEK ENDED JAN 31

Notifications —The following cases of infectious disease were notified during the week smallpox, 0, scarlet fever, 1076, whooping-cough, 1439, diphtheria, 892. paratyphoid, 14, typhoid, 10, measles (excluding rubella), 1235, pneumonia (primary or influenzal), 1304; puerperal pyrexia, 167, cerebrospinal fever 156; poliomyelitis, 5, encephalitis lethargica, 6, dysentery, 125, ophthalmia neonatorum, 69 No case of cholera, plague or typhus fever was notified during the week.

Deaths —In 126 great towns there were no deaths from enteric fevers, 3 (0) from scarlet fever, 2 (0) from measles, 14 (4) from whooping-cough, 33 (4) from diphtheria, 48 (9) from diarrhoea and enteritis under 2 years, and 90 (15) from influenza The figures in parentheses are those for London itself

Fatal cases of influenza were scattered over forty-eight great towns Birmingham reporting 4 no other town more than 3 There were 5 deaths from diphtheria at Liverpool

The number of stillbirths notified during the week was 230 (corresponding to a rate of 38 per thousand total births), including 20 in London

---

Sir Harold Gillies writes to say that the film on plastic surgery in war time (*Lancet*, Feb 7, p 188) which was made for exhibition in the United States and Latin America was intended to show injuries and not results Sir Harold himself operated on only two of the cases and the other operations were done by members of the unit

Corrigenda.—Mr Harvey Jackson was reported (*Lancet* Jan 31, p 141) as having said, at the RSM discussion on sciatic pain that hernia of the nucleus pulposus by itself did not produce sciatica. Actually he wished to infer that sciatica per se is not adequate evidence on which to diagnose hernia of the nucleus but that sciatica associated with pain and postural changes in the lumbar region might be so caused —Dr D S Fleming (*Lancet*, Jan 31, p 120) is a graduate of the University of Minnesota and not of McGill University

Letters to the Editor

PANCREATIC FISTULA IMPLANTED INTO THE STOMACH

Sir,—I should like to congratulate Mr Harold Edwards on the fine judgment and skill he demonstrated in the management of his case of pancreatic fistula as reported in your issue of Jan 31 (p 137) His paper will undoubtedly stimulate fresh interest as regards the most successful treatment to adopt in cases of pseudo-pancreatic cyst and also of those difficult cases of intractable pancreatic fistula which follow drainage of a false cyst The generally accepted treatment for false pancreatic cyst is marsupialisation and drainage, as originally recommended by Gussenbauer This is well exemplified in E S Judd's series (*Arch Surg.* 1931, 22, 838) of 47 cases, of which 44 were treated by marsupialisation and drainage and only 3 by complete excision of the cyst It should nevertheless be remembered that in the 9 recorded cases of primary anastomosis between a pancreatic cyst and a portion of the intestine there was no postoperative fatality and the late results were excellent in every respect

It is generally agreed that complete excision of the cyst is dangerous and is often followed by leakage of pancreatic juice and fistula formation The mortality following extirpation of a pancreatic cyst is about 20% provided the cyst is completely removed, but it may be as high as 55% if excision is attempted and fails In Mr. Edwards's case drainage was undoubtedly the correct primary procedure, for his patient was in extremis and the diagnosis uncertain · but for the more chronic types, in which the cyst wall may be considerably thickened a short-circuiting operation—pancreatico-enterostomy—may well be the method of choice, as emphasised by F H Lahey (*Surg Gynec Obstet* 1937, 64, 79)

In most cases of pseudo-pancreatic cyst which are treated by marsupialisation sound healing of the tract may be expected within six weeks provided a well-planned course of treatment is instituted which includes protection of the skin with kaolin or aluminium paste, measures for lessening pancreatic secretion by Wohlgemuth's regime (*Berl klin Wschr* 1908 44, 47), and the preservation of the pancreatic juice which has been obtained by continuous water suction and its reintroduction into the alimentary tract after it has been thoroughly mixed with food In those cases where the pancreatic fistula persists for more than six weeks it will often be necessary to dissect out the tract and anastomose it with the stomach or jejunum Up to date 27 cases have been recorded in which the coned-out fistula has been anastomosed to some portion of the intestinal tract Of these 15 were performed as pancreatico-gastrostomy 10 as pancreatico-jejunostomy, 1 as pancreatico-cholecystostomy and 1 as pancreatico-cholecystostomy followed by cholecystogastrostomy In this series there was only one death—namely Holbaum's case (*Zbl Chir* 1927, 54 1436) In all the other cases the immediate and late results were in every respect gratifying

Although Mr Edwards's case of implantation of the fistulous tract into the stomach was highly successful, I maintain that it is safer and easier to implant the tract into an adjacent coil of jejunum and I would suggest the following technique

The fistulous tract is plugged with gauze and coned out of the abdominal wall The abdominal incision is enlarged above and below the coned-out area to allow of free access to the stomach, the pancreas and the structures in the immediate neighbourhood The distal end of the fistulous tract is seized with Allis forceps to keep it taut while it is pared down to its indurated base in the pancreatic substance In the process of paring the tract, pains must be taken not to buttonhole it or to make it too thin as this would render it useless for implantation into the intestine A rubber tube which fits the tract snugly is next introduced right to the bottom of the tract down to the pancreas and then tied in position near the distal end of the fistula with a stout silk ligature

The tract is prepared in this manner before an opening is made in the jejunum for its reception A loop of proximal jejunum is next brought over the transverse colon and laid by the side of the fistulous tract in such a way that there is no kinking or traction of the intestine The selected portion of jejunum is lifted up with four pairs of Allis forceps, and at a chosen point exactly opposite the antimesenteric border a purse string suture of fine silk is inserted, and in the centre of this a small hole is made with mosquito forceps As the Allis forceps exert upward traction and steady the gut, the forceps are thrust through the wall of the intestine and the blades are separated to make the opening of sufficient size to accommodate the fistulous tract Two silk sutures, threaded on intestinal needles, are passed near the end of the fistulous tract These help to guide or lead the tract into the jejunum, and when it is ascertained that the tract and the rubber tube are lying comfortably in the lumen of the intestine, the purse string suture is drawn taut and tied, while the guide sutures are immediately removed The tightening of the purse-string suture cannot occlude the lumen of the fistulous tract owing to the presence of the retained rubber tube

The jejunum is then anchored to the base of the fistulous tract above and below and to the tissues around on either side, not only to fix it into position and to prevent it from being drawn away from the fistulous tract but also to avoid any angulation of the intestine where it is sutured Portions of the adjacent omentum are drawn over the operative site and the abdomen is closed in the usual manner, pains being taken to guard against dehiscence of the wound After a variable time the rubber tube in the fistulous tract works loose and is passed per anum

I maintain that the technique here described is preferable to that outlined by Mr Edwards, in which a portion of the skin of the abdominal wall is anastomosed to the mucous membrane of the stomach The skin must become digested and in this process leakage may possibly occur at the line of anastomosis Again, there are many disadvantages in the partial loss of pancreatic ferments which result from the interaction of gastric secretion and the pancreatic juices

Wimpole Street, W 1 RODNEY MAINGOT

INTRAOCULAR FOREIGN BODIES

SIR,—The extraction of magnetic foreign bodies from the vitreous chamber of the eye by the scleral route—a procedure condemned by your reviewer of Spaeth's book—is a satisfactory operation and one likely to cause less damage to the eye than if such fragments are pulled out through the suspensory ligament of the lens and through the anterior chamber This was the conclusion of William Sweet of Philadelphia, who reported on over 700 cases of intraorbital foreign body, many of them treated by himself, and most of them patients of the Wells Hospital, Philadelphia, where he X rayed the eyes He undertook a careful follow-up of the patients and so his opinion is founded on a wide knowledge of the subject His conclusion is certainly borne out by the results in those patients on whom I have used the method

I realise that there is antagonism in some quarters to the scleral operation, and I have in the past tried to find out on what grounds it is disliked I found that the objections—three in number—were for the most part theoretical and often voiced by those who had not tried the method First, they said, it increases the liability to retinal detachment, but this statement has no foundation in fact, and was disproved by Sweet's careful follow-up Detached retina does not follow sclerotomy for glaucoma, so why should one expect it after sclerotomy for foreign-body extraction? If the surgeon persists in regarding it—against all the facts—as a drawback, he can apply the diathermy to the sclera before making the section, but I have never done this myself as I consider it unnecessary and it adds further injury to a severely damaged eye Secondly, they said, there is the likelihood of vitreous loss during the operation I can only reply that if the operative procedure is correct vitreous does not escape and does not appear likely to do so The third objection was that a weak scar would be left in the sclera There may be more point to this objection, but if the incision is placed beneath the reflected external rectus, and if the scleral wounds are closed by sutures which have been inserted before the section is made, then I do not think there is any danger of a weak scar

The scleral approach is especially suitable to the vitreous foreign-body of war-time, which often contains a very small amount of iron and is therefore only slightly magnetic By this method the magnet can be brought nearer to the fragment and there is thus more likelihood of it being extracted

The end-result in these patients is determined by factors largely outside the surgeon's control—the extent of the damage already done to the eye, and the length of time the foreign body has been present The surgeon's aim must be to extract the particle with as little additional damage as possible, and I believe that this condition is fulfilled by the scleral operation

Harley Street, W 1 SEYMOUR PHILPS

GINGIVITIS IN THE FORCES

SIR,—In their letter of Jan 31 (p 153) Dr Stuhl and Mr Coventry state that the gingivitis occurring in the Midlands is due largely to lack of vitamin C They suggest that "the initially swollen and bleeding gum" (presumably a manifestation of active scurvy) became infected "where treatment was delayed," and give the impression that the septic gingivitis was due to organisms already present in the patient's mouth During the past three months, in a hospital not far from their own, I, too, have seen a number of patients with gingivitis, 57 of them soldiers From the description of the disease given by Dr Stuhl and Mr Coventry it appears that the cases I have watched are of the same nature, but my conclusions are different

I do not doubt the prevalence of vitamin C deficiency, for, though I have been unable to carry out blood or urine estimations on my patients, the observation has been confirmed by other workers in the district and the patients' descriptions of their diets were certainly suggestive I agree entirely that such dietetic inadequacy should be remedied but I doubt whether it is the factor primarily responsible for the present outbreak If it is, the condition should be rapidly cured by ascorbic acid, even without local treatment, but this has not been my experience Possibly I gave inadequate amounts of the vitamin, but surely if deficiency is responsible a few patients should show hæmorrhage into the hair follicles, or some other manifestation of scurvy Neither they nor I have yet met such cases For the following reasons I believe that infection is the essential cause of the epidemic:

1 The disease has not been sporadic, as might be expected with scurvy, but contact with other cases has been the rule

2 There have been two examples of a man on leave infecting his wife and at least one instance of spread in a ward, the patient affected having been in hospital and on an excellent diet for many weeks

3 A few of the patients, especially those working as cooks, have had plenty of fruit

In curious contrast to the experience of Dr Stuhl and Mr Coventry, Vincent's organisms, which I had assumed to be responsible for the fœtor, have been present in profusion in almost every case It would be unwise to say that they cause the disease, for the weight of evidence suggests that they are only secondarily pathogenic I have previously stated my belief that the primary cause of the condition is a virus (or thrush in infants) which prepares the ground for invasion by Vincent's organisms (*Arch Dis Childh* 1940, 15, 43) It is possible that vitamin-C deficiency may similarly lower resistance to the infecting virus Roughly a quarter of the patients I have seen developed labial herpes in the course of the disease, and at the onset some had an herpetiform eruption on the oral mucous membrane I do not consider that this in itself is evidence that the herpes virus is responsible for the condition, for all the men who developed labial eruptions were subject to recurrent herpes, usually associated with upper respiratory infections, and in no case did herpes develop de novo during the course of the gingivitis There is, however, experimental evidence to support the view that it is the herpetic virus which is the essential cause of this kind of gingivitis (Dodd, K, Johnston, L M and Buddingh, G J, *J Pediat* 1938, 12, 95; *Amer J Dis Child* 1939, 58, 907)

I hope that Dr Stuhl and Mr Coventry will be able to report the comparative results of treatment (*a*) with ascorbic acid alone, (*b*) with local treatment only, and (*c*) with a combination of both My own feeling is that the excellent results they have obtained are due to the very efficient local treatment which they prescribe, rather than to the giving of vitamin C, however necessary this may be "The preparation must be applied to the *interdental spaces by soaking pledgets of cotton-wool* in the solution and probing them into these spaces where possible" This suggests personal daily supervision by a dental officer and I am sure that therein lies the secret of their success The solution applied is probably of little importance although I still pin my faith to the easily seen gentian violet

Lichfield, Staffs **CLIFFORD G PARSONS**

SUPERFLUOUS PREPOSITIONS

SIR,—I have been distressed lately by meeting in THE LANCET, not only in the original articles but even in the editorial comments the expression "try out" Have the words "try" and "test" gone out of conversational currency ? In crime stories I expect the chief of police on receiving some new information to send one of his subordinates to "check-up on it" It would be beneath him to tell his subordinate merely to "check" the information We used to refuse to "stand" or "tolerate" an injustice, now we refuse to "stand for" it (this intrusive and unnecessary "for" finds no authority in the Oxford English Dictionary, or justification in Wright's Dialect Dictionary) If my present grievance cannot be met I suppose I must face up to it

Wakefield **REGINALD LAWRENCE**

⁂ Under "try out" the Concise Oxford Dictionary gives "put to the test, test thoroughly"—ED L

POSTURE DURING SLEEP

SIR,—It may be of interest to mention some facts brought out by the experiments in bronchospirometry conducted by Bjorkman He tested several persons in different postures, and found that—in direct opposition to views previously held—the uppermost lung did a lesser share of the work than the lower, compressed lung Results obtained during these investigations may be read in an article by H C Jacobæus (*Brit J Tuber* 1936, 30, 114)

Kelling Sanatorium, Norfolk. **B G RIGDEN**

INFECTION OF FOODSTUFFS

SIR,—There is one matter in connexion with the outbreak of paratyphoid fever so fully and ably reported upon in your issue of Jan 31 on which further information would I think be appreciated by those concerned with public-health administration For many years efforts have been made, with more or less success, to secure that in all premises where food is prepared hand-washing facilities shall be provided as near as possible to w c accommodation, and that the importance of hand washing immediately after the use of the w c shall be impressed on all workers by suitably placed notices May we ask what were the arrangements regarding these matters at the firm in question, and what was the practice of the carrier who was responsible for the outbreak ?

Potters Bar **MAITLAND RADFORD**

RELAPSING FEVER

SIR,—The discovery recently in a London hospital by Dr Stannus of a refugee from the continent suffering from relapsing fever (*Lancet* Jan 24, p 103) is a fresh instance of the possibilities of transmission of disease by aircraft Good fortune took the man to someone with African experience As to *Ornithodoros tholosani* being a vector of the spirochæte in Persia, it may well be so, but Dr C M Wenyon tells me that the latest reference (Donuschevsky, Latuishev *Rev appl Ent* 1927, 15 216) is not conclusive It is certain, however, that the body louse is a vector in epidemics there, generally with typhus fever and in times of famine This was so when British troops were last in Persia—that is to say, during and after the war of 1914–18

Perhaps another famous vector problem may be settled now Will some enterprising medical officer succeed where others have failed and learn if "Mianeh fever" really exists and if so whether it is a relapsing tick-borne disease conveyed by *Argas persicus*, the "gharib gez" (the stranger-biter) ?

Droitwich **A. R NELIGAN**

RED CROSS HOSPITAL IN CHINA

SIR,—After consultation with representatives of the British Government, the war organisation of the British Red Cross Society and Order of St John decided to offer to send out to China the personnel and full equipment for a hospital of 200 beds to work in close coöperation with the Chinese Red Cross, and to be located in some place accessible to the motor road system of Free China The Chinese Ambassador was approached and cabled his government in Chungking which replied gratefully accepting the offer

Dr H Gordon Thompson secretary of the British Fund for the relief of distress in China is acting as secretary in this section of our work The scheme envisages a British staff of an administrator, four surgeons, three physicians, a radiographer, a storekeeper and accountant a matron, and 14 nurses Doctors and nurses, especially any who have knowledge of the Chinese language, are required and should communicate as soon as possible with Dr Gordon Thompson, 14, Grosvenor Crescent, London S W 1 Their letters should be marked "China"

HORDER,
Joint Chairman, Hospitals and
Medical Services Committee

"STATUS OF WAAF DOCTORS"

SIR,—On Jan 31 (p 156) you published a paragraph under this heading completely at variance with the truth which is that —

1 Women medical officers working with the RAF medical service are not and never have been in the WAAF

2 Women medical officers have always attended men as well as women in the Air Force

3 Women medical officers have not been granted equa status with their male colleagues in the RAF

4 A woman medical officer if appointed as SMO of a station could not carry out her duties efficiently with her present status

As a woman medical officer I am greatly concerned at the recent Air Ministry order which has confirmed we are virtually without rank We are not allowed to be addressed by our rank title and we hold our "relative rank" solely with regard to other women medical and dental officers

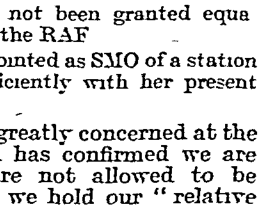
While writing this protest I would like to add that the generous loyalty of our male colleagues has enabled us to carry out our duties without the lack of status becoming apparent

WOMAN MEDICAL OFFICER

Obituary

CHARLES ARTHUR MOYNIHAN

M R C S , CAPTAIN R A M C



Captain Charles Moynihan who was killed in Malaya in December, at the age of 28 was born in Santa Cruz, the second son of Mrs D M Moynihan and the late Mr. H J Moynihan of Gloucester Place London He was educated at University College School King's College and the Westminster Hospital where he took his M R C S in 1937 He had already made up his mind to join the R.A M C, but first he was eager to do some postgraduate work in his chosen specialty and within a few days of qualifying he had obtained a house-appointment at St Paul's Hospital, Endell Street, where he had opportunity to study the pathology and blood reactions of disease He was a sensitive man and a fellow resident recalls sympathetically his anguish at the horrors of the Spanish civil war in which many of his personal friends were involved Moynihan entered the R A M C in 1937 was promoted captain a year later, and when he died was acting major

EADRIC CLIFFORD FOUNTAINE

M.R.C.S., D.T.M. & H., CAPTAIN R.A.M.C.

Captain E. C. Fountaine, who was killed on Jan. 3, in Iceland, as the result of an accident, was a mountaineer and traveller as well as a doctor. From Jesus College, Cambridge, he went up to Bart's, spending his holidays climbing in Wales, Skye, and Switzerland, and he was a pre-war visitor to the Lofoten Islands. He qualified in 1933 and held house-appointments at Bart's and at Chichester Hospital before sailing in 1935 to Greenland in the *Quest* on a geological and surveying expedition. He was one of the party who made the first ascent of the highest peak in the Arctic—one of the Watkins range—and later wintered at Kangerdlugssuak, on the east coast of Greenland, where he also took part in sledging journeys and climbs. After his return to England in 1936 he was awarded the Duncan medal for his work in the D.T.M. & H. course at the London School of Hygiene. He spent some time as an assistant in Norfolk before he sailed in March, 1939, for India with a party, led by Mr. Eric Shipton, who intended to spend a year or so in unexplored parts of the Karakoram range. The expedition had crossed and mapped several new passes when on Oct. 1 news of the outbreak of war reached them, and they had reluctantly to abandon their plans. There was some delay before Fountaine got a passage home and he only returned to set out once more, this time with the British Expeditionary Force to Norway. On his return he served in various parts of this country before he was *posted to Iceland in October.*

A friend has aptly written of him: "Besides being a very good doctor Fountaine realised that he had only one life on this earth to live and that life has many aspects." And of these he took full advantage in his thirty-five years. He was the eldest son of the late Mr. A. C. Fountaine of Croydon.

A SYMPOSIUM ON CHEST WOUNDS

THE E.M.S. chest unit for Liverpool and the north-western area is developing a chest centre through which it will be possible to admit patients to the Clatterbridge Municipal Hospital. At present the unit and the centre are commingled, but it is hoped that when the war is over and the unit disappears—with the emergency to which it owed life—the chest centre will be fully established and able to carry on the responsibilities of peace. At a meeting on Jan. 29, Mr. H. MORRISTON DAVIES, director of the chest centre, Merseyside Group, resumed the reading and discussion (begun on Jan. 15, see *Lancet*, Jan. 31, p. 148) of a series of short papers on war wounds of the chest at the Liverpool Medical Institution.

The final meeting of the course will be on Feb. 12.

SHOCK AND SUCKING WOUNDS

Mr. J. T. MORRISON, speaking of shock and sucking wounds, said that plasma was not contra-indicated in the treatment of shock in cases of wounds of the lung. Shock in such cases might be due to bone damage, anoxæmia resulting from open thorax, pressure pneumothorax or hæmothorax, cardiovascular embarrassment from mediastinal displacement, trauma of mediastinal nerve plexuses, or of course hæmorrhage. Persistent hæmorrhage called for immediate operation while blood-transfusion was actually being given. He classed wounds of the chest into those with an entrance wound only, those with entrance and exit wounds, and those with tangential wounds. With those in the first group operation was not usually required if the foreign body was small; if it was large and accessible it should be removed. The parietal wound should be excised, to prevent sepsis, as soon as the general condition allowed; damaged bone should be removed freely. When the pleura was intact the wound should be dealt with like a wound in any other part of the body; small tears in the pleura might be ignored, but with larger openings part of a rib should be removed, and the cavity explored and mopped dry; any foreign bodies should be removed and closure should be airtight. Closed intercostal drainage in the postscapular line would meet the danger of sepsis. He considered that sucking wounds were among the few indications for surgery at first-aid posts; they must be closed at the earliest possible moment by suture, strapping, or layers of 'Vaseline' gauze. When the patient reached hospital, oxygenation must be maintained during operation. After excision of the wound the chest must be closed by approximating the ribs, by muscle flaps, or as a last resort by skin only. Separate intercostal drainage was needed until the danger of empyema was past. The patient was nursed in the Fowler position and the pillows must be arranged vertically so as to give easy access to dressings. Wounds seen after 6–12 hours would usually only be suitable for debridement, with opening up of subfascial tracks, removal of accessible foreign bodies and relief of tension. In carrying out these measures it was important to avoid opening up any pleural wound which might have become sealed off; if such a wound was accidentally opened the pleura should be closed again and drainage provided at a suitably dependent point.

FOREIGN BODIES IN THE LUNG

Mr. HUGH REID said that treatment of cases with foreign bodies in the chest called for the cooperation of the physician, surgeon and radiologist. Such cooperation was achieved by the weekly conferences at the chest centre. In diagnosis, history and clinical signs were doubtless important, but among air-raid casualties the history obtainable was often defective and the clinical signs difficult to interpret, giving no idea of the number, size or position of the foreign bodies retained in the chest. Radiology, then, was of paramount service, but the films must be good, correctly centred, penetrating to show up the *foreign bodies, and including the whole chest.* They must be taken at the earliest possible moment so that treatment was not delayed, and a lateral as well as anteroposterior film was needed. Blair and Sellors of the Harefield Thoracic Unit held, he said, that patients on admission should be sent to the wards by way of the X-ray department; they need not be moved from the stretcher. Among pitfalls in localising a foreign body were the facts that marks made on the skin shifted their relative position when the shoulder girdle was moved, and that foreign bodies were shifted in the lung by movements of the patient. In early cases shock, hæmorrhage, infection and disordered respiration and circulation must be treated, and shock was of course the first consideration. A counsel of perfection in early cases was to remove the foreign body at once, because treatment for hæmorrhage, lung laceration and contamination could be carried out at the same time, and the wound could be excised. In cases seen later the foreign body should be left in situ until the wound healed; in the meantime such conditions as hæmothorax could be treated. Foreign bodies less than ¼ in. square need not be removed; larger foreign bodies should probably always be extracted because they were liable to give rise to pulmonitis, fibrosis, bronchiectasis, repeated hæmoptysis, and, if near the surface, to pleural adhesions, if deeper to pericardial irritation. It might, however, take as long as 30 years for symptoms to manifest themselves; the choice, therefore, was between a difficult and often dangerous operation, and the chance of chronic illhealth from complications. The operation of choice was thoracotomy as practised by Duval; the incision into the lung was not attended with undue bleeding. It might be feasible to pass alligator forceps into the lung through a small stab wound and extract the foreign body under direct vision by X-ray screening, but he had not attempted this.

ANÆSTHETICS

Dr. JOHN HALTON said that two main groups of chest-wound cases needed inhalation anæsthesia: immediate cases, requiring operation within 6–8 hours; and deferred cases requiring operation at some chosen time later. In the first group some degree of anoxia was always present as a symptom of shock. Those in the second group though not actually anoxic were often near it, and an ill-chosen anæsthetic might precipitate a crisis. Shock, by altering the oxygen dissociation curve and diminishing the alkali reserve of the blood, also complicated anæsthesia. The method chosen must give the surgeon scope and must not produce anoxia or increase it if present; it should rather counteract anoxia. Rapid induction and recovery were needed, together with easy control of the depth of anæsthesia and minimal postoperative toxic effects. Nitrous oxide might appear to meet these requirements but was extremely dangerous in major thoracic injuries and should never be used without carbon-dioxide absorption Even with absorption and in expert hands it might cause a grave degree of anoxia which was almost free of signs at first a rising pulse-rate and gasping respiration were late—and almost the only—signs The anæsthetics of choice were light ether-oxygen given in a closed circuit, with the Oxford apparatus or an Ogston mask, cyclopropane in accustomed hands, or where a non-explosive anæsthetic was needed, trichlorethylene and oxygen in a closed circuit Chloroform was contra-indicated Postoperative oxygen therapy was needed Premedication should err on the side of underdosage, but the barbiturates were useful

Dr **Kenneth Roberts**, in a short paper on the rapidly acting barbiturates with special reference to 'Pentothal Sodium,' described them as essential, either as basal or sole anæsthetics, in thoracic surgery.

DISEASES OF EAST AFRICA

Sir Philip Manson-Bahr sends us the following letter from his son, Major Clinton Manson-Bahr, M.R.C.P., E.A.A.M.C., dated Oct 18, 1941

I have just received the reprint of your *Lancet* article of May 10, and I thought you might like to hear how it has been borne out on the spot

Malaria.—There is not much to remark on here, but on the way to Addis the species of malaria changed according to your description At first in Addis the malaria was almost all subtertian, for the troops had passed through the malarious area (Diredawa to Awash) where the malaria is all of that variety In the campaign in the Lakes the malaria was also subtertian, most of it coming from the unhealthy Omo river where there was some considerable fighting With the finish of the fighting and the removal of troops, a change took place as we were draining local sick. The malaria became more and more benign tertian, and as you say, *Plasmodium vivax* must undoubtedly exist in Addis Ababa since there were first infections in Europeans who had not been out of Addis for nearly three months The development of the problem of *P wilsoni* has been disappointing as Dr Roberts has not received another specimen from inside Abyssinia yet There was one doubtful one in Addis

Leishmaniasis.—There has been an interesting development with regard to visceral leishmaniasis In one company of K.A.R there have been about 30 cases of undoubted kala-azar While down in Kenya I saw a few of them at Nyeri and the crithidial forms had been cultured from one autopsy by Major Robertson, who was pathologist at Accra He gave me a slide from the culture These cases occurred in this company who were stationed north-east of Lake Rudolf in a completely uninhabited area where there were no natives or dogs Symes, the Kenya entomologist, says that about 1926 a company of Sudanese Defence Force trekked down through this area to meet the K A R and there was an outbreak of Kala-azar on their return to the Sudan The case I found in an Arab in Garba Tulla in the Northern Frontier Province of Kenya, of whom I sent spleen smears to Major Robertson, was also positive for L D bodies He had never been away from Garba Tulla This was in September, 1940, Dr Sequeira then found in the literature some 8 cases from the Northern Frontier district

Relapsing fever.—The incidence of this has been, as you say, there being a change in the vector as you approach the highlands from the Somaliland desert In fact there must be quite a sudden change as one approaches the Addis Ababa plateau The Italians think it possible for the spirochæte to change its vector from the tick to the louse, this is then followed by a change in virulence for the worse Certainly the louse-borne form has been very virulent in our askaris and there have been plenty of deaths

Yellow fever.—There have been several deaths (I have done a p m on two) with high fever and severe jaundice, and one case had had hæmatemesis The blood smears and spleen smears were negative Autopsy revealed a severe toxic jaundice with spontaneous rupture of the spleen in one case, looking just like a relapsing fever but no spirochætes to be found I have kept some liver for section but this has not yet been done I think they were relapsing-fever cases I do not know their movements well but they had been in Addis for some time

Typhus.—The typhus in Addis is as you say, all louse borne, and many of the Italians die every year from it But the Italians say the case-fatality is nothing like as high as in European epidemic typhus, being in the region of 30% There is a seasonal recrudescence in September Apparently also they get murine typhus in Southern Abyssinia and this is borne out by the fact that there is an increase of this disease when the rats are driven into the houses There has been some trouble over murine typhus, as the South African XK suspension does not seem to be much good and has agglutinated much too frequently in some cases of relapsing fever One of our medical officers contracted tick-borne typhus, developing it when he got to Addis He must have contracted it in Somaliland He had a local sore adenitis and considerable fever His Weil-Felix showed some agglutination to all three strains but only in very low titres

Dysentery.—The Italians swear there is no bacillary dysentery in the coastal Mogadishu region, but among some British sailors who were captured by a raider and left near Mogadishu a large number developed bacillary dysentery when we arrived Also some British signallers when in camp just outside Mogadishu had a severe outbreak of bacillary dysentery, although there were no deaths There is a fair amount in Addis, chiefly Flexner and non-specific types There is also a fair amount of amœbiasis around Addis as many askaris came in with vegetative forms of *E histolytica* in their stools presumably contracted in the locality

Venereal disease.—I have just finished two months at the V D hospital where I worked with the Italian director of venerealogy Soft sore is the commonest disease I saw two pukka cases of lymphogranuloma inguinale, both from the Negheli region The Italian doctor told me it occurred in Italian Somaliland but not in Abyssinia proper Granuloma venereum occurs in the Gondar region and Western Abyssinia, but I never saw a case in Addis, even among the Abyssinians, some were shown, but I am sure they were secondary syphilitic condylomata The syphilis is just the same as the European disease, except that the secondary stage supervenes earlier and is more severe in the African. Askaris from areas where yaws occurs in our East Africa developed syphilis just the same Mixed chancre was extremely common, the syphilitic being masked by the soft chancre, often to the detriment of the patient

Helminthic diseases.—The Italian Dr Pauli, who is an expert laboratory worker, says he has not seen *Bilharzia mansoni* in Abyssinia—in fact, he was very excited when shown some eggs in the fæces of some of our West Africans

* * *

There is a pair of lesser kestrels just by my bedroom and I think they are going to nest I have taken some cine films of them, for they are very tame By my book on birds (Jackson) and my glasses I think they are of the Eastern race

---

London County Council.—At the meeting of the council on Feb 10 the civil defence and general purposes committee recommended that the council shall set up and operate on behalf of the Ministry of Health day nurseries in suitable rest centres for children between the ages of two and five years, whose mothers are engaged on war work or other whole time employment It is understood that the Ministry will probably ask for the establishment of some 50 nurseries with a daily attendance of up to 1000 children. One of the conditions attached to the recommendation is that the borough medical officers of health shall extend their medical oversight of rest centres to these nurseries

The mental hospitals committee has recommended that from April 1, 1942, the weekly charge for rate aided mental patients shall be increased by 3*s* 6*d* to 36*s* 2*d* a head A similar adjustment will be made in the charge for "private list" cases

Royal Medico Psychological Association.—A meeting of this society will be held at 11, Chandos Street, London, W 1 on Thursday, Feb 26 at 2 30 P M, when Dr J H. Gould will read a paper on electrical convulsant thresholds

Medical News

University of Cambridge

The titles of the degrees of M B , B Chir have been conferred on Mrs A Davies

On Feb 6 the following degrees were conferred —

M D—W H Valentine and E T C Spooner

M B , B Chir—* E V Hope, * S L Melville, * G O Franklin, * A H Rea, * Noel Gillman, and G F Purves

* by proxy

Society of Apothecaries of London

The following having completed the final examination of the society have been granted its diploma entitling them to practise medicine, surgery and midwifery —

C N d'E Eastes, Guy's , J T Hemmingway, Anderson Coll , Glasg , S A MacDonald, St Thos , G O Kennedy, Guy's , R L Shea, Guy's , and C R Deuchar, Dubl

Medical Superintendents Society

A meeting of the main executive committee of this society will be held at the Midland Hotel, Derby, on Saturday, Feb 21 at 11 45 A M It will be followed by the annual meeting of the Midland branch at 2 30 P M.

Glasgow Medico-Chirurgical Society

At a meeting of this society to be held on Wednesday, Feb 18, at 7 30 P M in the Lister theatre of Glasgow Royal Infirmary, Mr Norman Dott will speak on brain surgery in Britain, 1939–41

Medical Casualties

In a recent casualty list the following R A M C officers have been posted as wounded W S/Captain Leonard Bapty, M B Aberd , W S/Captain A R Duff, M B Edin , and T/Major W G Macfie, M B Glasg

Nutrition Society

This society will hold a conference on food production and distribution in relation to nutritional needs on Saturday, Feb 28, at the Dunn Nutritional Laboratory, Milton Road, Cambridge Sir Wilson Jameson will take the chair at 10 A M , and those who will read papers include, Sir John Orr (the agricultural implications of a food policy based on nutritional needs), Mr N C Wright, D Sc (rival claims of animals and man for food), Mr E T Halnan (animals as food-converters) and Sir John Russell, F R S (planning for agricultural production) Provisional arrangements have been made for further meetings when the preparation of food in war time and nutritional requirements for optimal health will be discussed

Royal Sanitary Institute

A meeting of the institute will be held at the Nuffield Institute of Clinical Research, Oxford, on Saturday, Feb 28, at 10 A M , when Mr H H Crawley, A M Inst C E , deputy water engineer for the borough, will speak on the storage of emergency drinking supplies Mr Stewart Swift, chief sanitary inspector and evacuation officer for the borough, will describe the administration of the Government evacuation scheme, and Dr H C Jennings, county medical officer of health will open a discussion on the scheme Further information may be had from the local secretary for the meeting, Dr G C Williams, Greyfriars, Paradise Street, Oxford

Royal Society of Medicine

The section of comparative medicine of this society will meet on Wednesday, Feb 18, at 2 30 P M , for the third discussion in the series on the control of diseases of cattle inimical to man, when Mr A W Stableforth, D Sc , Dr V D Allison and Mr S L Hignett will speak on mastitis and streptococcal infection At 2 30 P M , on the same day, the section of psychiatry has arranged a symposium on the assessment of mental responsibility with special reference to the armed forces Those taking part will include Brigadier H Shapcott, Air Commodore H L Burton, M B , Surgeon Lieut -Commander E W Anderson and Major E A Bennet On Feb 19, at 2 30 P M , at the section of neurology, Dr J G Greenfield, Major Ritchie Russell and Dr J Hamilton Paterson will open a discussion on cerebral œdema On Feb 20, at 2 30 P M , short papers will be read at the section of obstetrics and gynæcology, and at the same time at the section of physical medicine Dr J L Halliday is opening a discussion on the psychological aspect of rheumatoid arthritis The section of orthopædics will meet on Feb 21 at 11 15 A M , at the Royal National Orthopædic Hospital, Brockley Hill, Stanmore

Chadwick Lectures

The following lectures have been arranged by the Chadwick Trust for the coming months Tuesday, Feb 24, at 2 30 P M., Mr W G Culpin, F R I B A , reconstruction after the war (at 26, Portland Place, London, W 1) , March 17, 2 30 P M , Dr W A Bird, nervous shock in peace and war (London School of Hygiene, Keppel Street, W C 1) , April 14, 2 30 P M , Mr D C Graham, M Inst C E , dangers from rainfall in urban areas (Royal Sanitary Institute, 90, Buckingham Palace Road, S W 1) , May 12, 2 30 P M., Dr Alison Glover, the school medical service in war-time (26, Portland Place, W 1) , June 18, 4 P M , Mr E Augustus Bowles, plants in relation to food, medicine, or poison (Chelsea Physic Garden, Swan Walk, S W 3) Further particulars of these lectures may be had from the secretary of the trust, 204, Abbey House, Westminster, S W 1

Thanks a Lot

Mr Ernest Brown has written to thank the American Ambulances of Great Britain for the help they are giving us Up to the end of November the fleet of ambulances, which reached its full complement of some 270 vehicles last August, had travelled over three million miles At present it carries about 2500 hospital patients a week, and also provides speedy transport for teams of consultants and for the blood transfusion services Surgeon Rear-Admiral G Gordon Taylor who is on a visit to America has also paid a tribute to the work of the service, especially for its help in salvaging the Hunterian collection when the College of Surgeons was bombed last year

Births, Marriages and Deaths

BIRTHS

ABRAHAM —On Feb 3, at Harpenden, the wife of Surgeon Lieutenant J O G Abraham, R N V R —a daughter

COOPE —On Feb 6, the wife of Dr Robert Coope, of Liverpool—a son

COUTTS —On Feb 1, at Chesham Bois, Bucks, the wife of Lieut Colonel J O Coutts, R A M C.—a son

CRAIG —On Feb 5, the wife of Dr J W Craig, of Haslemere—a son

EVANS —On Feb 2 to Dr Barbara Evans (née Hay-Cooper) wife of Dr Philip Evans of Anstye Cuckfield, Sussex—a son

NEILL.—On Feb 2, at Leicester, the wife of Captain J H Neill, R A M C —a daughter

RIDLEY —On Feb 8, at Woking, the wife of Mr Harold Ridley, F R.C.S —a daughter

SHARP —On Feb 6, at Epping, the wife of Dr Edward Sharp—a son

MARRIAGES

CADMAN—HAWKINS —On Feb 7, at Wellington Shropshire, Donald Spencer Cadman, M B to Mary Sylvia Hawkins

HENDERSON—MORTON —On Feb 7, at Warblington, Hampshire, Peter Wallace Henderson, B M , to Stella Dolores Morton B M

JOHNSTON—PETERS —On Jan 28, at Basingstoke Charles Leslie Johnston, M R C S , to Kathleen Peters

THOMSON—STEWART —On Jan 31, in London, Colin Thomson, M B Captain R A M C , to Lesley Isabel Stewart, M B , flying officer, R A F

VAN DE LINDE—GIBSON —On Feb 7, at West Horsley, Patrick Van de Linde, M B , to Annie Brayshay Gibson

DEATHS

CATO —On Jan 30, at King's College Hospital Alexander McLean Cato M R C S , of Stanstead Road, Forest Hill, London, S E 23

JOHNSTON —On Feb 1, at Strabane, N Ireland, William Thomas Johnston, M D R U I lieut colonel, R A M C , retd

MACKEITH —On Feb 5, at Church Hill, Aldershot, Malcolm Henry MacKeith, D M OXFD, M.R C.P , aged 46

MORLEY —On Feb 3 Frank Morley, M R.C S , L.D S , of Randolph Crescent Maida Vale

ROBINSON —On Feb 7, at West Byfleet, William Moore Skipworth Robinson F R C S E

STATHERS —On Feb 6, at Brackley, George Nicholson Stathers, M R C S , D P H aged 84

WOODCOCK —On Feb 3, at Hove, Sussex, Harold Brookfield Woodcock, M B E , M B MANC.

Appointments

AYRES, G W , M B LOND examining factory surgeon for Chippenham Wilts

BURGES, R C L M B CAMB examining factory surgeon for Birmingham North

D'AMIAN, ELSE A , L R C P E temp asst M O H for Rawtenstall

PARIKH, STELLA A M B. LOND asst M O at Hastings Municipal Hospital

PATTERSON, ELEANOR, M B B HY DURH , D P H , temp asst M O H and asst school M O for Reigate

SWAN J F, M B. GLASG , D P H , D R C O G asst M O H for Manchester

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export

ORIGINAL ARTICLES

MENINGOCOCCAL ENCEPHALITIS

H STANLEY BANKS,
M D GLASG , D P H
MEDICAL SUPERINTENDENT OF THE PARK HOSPITAL, L C C

J E McCARTNEY,
M D , D SC EDIN
MAJOR R A M C , DIRECTOR OF RESEARCH AND PATHOLOGICAL SERVICES, L C C

(*Illustrative plate*)

Two recent events have contributed to a clearer understanding of the pathogenesis of meningococcal infection These are the step up in virulence and massive infection associated with the high epidemic prevalence of 1940 and 1941 , and the rapid clearing of organisms from the blood-stream and the meninges (that is, the rapid cure of the septicæmia and meningitis) produced by the sulphonamide drugs The first factor, acting especially near the peak of the epidemic in February and March of each year, produced an unusual number of fulminating and severe acute cases for study The second factor provided a means of investigating causes of death other than septicæmia and meningitis, for in most of the fatal cases, except the most rapid fulminating types, both the septicæmia and the meningitis had been largely cleared up by chemotherapy by the time the patient died These investigations have added to our knowledge of the incidence, nature and extent of encephalitis and also of adrenal lesions in meningococcal disease In this paper we indicate our findings in encephalitis and illustrate the main clinico-pathological types with representative case-histories and microphotographs The subject has already been briefly discussed by one of us (Banks 1940)

Netter and Debré (1911) summarised the early histological studies of meningococcal disease (Klebs 1877, Strumpell 1889, Hagelstam 1893, Flexner and Barker 1894, Councilman, Mallory and Wright 1898) In acute cases they described no conspicuous change in the brain tissue except congestion and œdema and occasionally vacuolisation and chromatolysis of the nerve-cells in the marginal areas close to the meninges They stated that the essential character of cerebrospinal meningitis is the limitation of inflammatory lesions to the meninges and the integrity of the subjacent nervous tissue It was early recognised that purulent meningeal exudate might sometimes dip right down into the sulci and extend some distance into the brain or cord as a perivascular infiltration around the larger vessels, but this was a direct extension of the inflammatory process from the meninges rather than a true encephalitis Boyd (1940) refers to the brain as being " curiously intact " These views have permeated the whole of the literature, and little attention appears to have been given to the histology of the brain in meningococcal meningitis for many years Encephalitis is just mentioned, however, in the larger textbooks, where it is stated that scanty foci of cellular infiltration, suppuration or hæmorrhage have occasionally been found Foster and Gaskell (1916) noted a case with deepening coma leading to death in about 5 days, in which there were perivascular hæmorrhages in the cord and cortex of the brain , and Worster-Drought and Kennedy (1919) found in a similar case, dying on the 7th day of illness, an area of softening beginning in the base and encroaching on the head of the caudate nucleus A recent example of a much more extensive meningococcal perivascular encephalitis is described by Jonesco-Sisesti and Stroesco (1939) In none of these isolated observations is any clinicopathological correlation attempted. Clearly the ordinary form of meningococcal disease is pre-eminently a meningeal infection with occasional scanty involvement of the cerebral tissue itself

During the epidemic of 1940–41 we observed a number of cases of meningococcal infection quite different from the ordinary form These were both fulminating and acute

Fulminating Cases

The fulminating cases were invariably fatal within 24 hours, and were generally divisible into two types—a cerebral or encephalitic type and an adrenal type—though a mixture of the two was also met with The adrenal type has long been recognised, but its description (the so-called Waterhouse-Friderichsen syndrome) is that of a mixture of types and even of infections

The pure *fulminating adrenal type* is characterised by sudden onset of fever, rapid deterioration, vomiting, a generalised petechial rash with some larger purpuric elements appearing within a few hours of onset, and the development of grave hypotension with cyanosis The mental condition is relatively unclouded and may be clear to the end, but only when the infection is restricted to septicæmia with adrenal hæmorrhage If there is meningitis the patient tends to become irrational or delirious, and if there is encephalitis he becomes stuporose and later deeply comatose

The *fulminating cerebral type* may be similar in onset and progress up to the development of the rash, or may even begin with coma The rash does not usually exhibit the larger purpuric elements, and hypotension does not develop, but stupor and coma always come on quickly The coma rapidly deepens until there is no response to painful stimuli Respirations become frequent and laboured, grunting or stertorous, but are not associated with pneumonic signs Cyanosis is usual In the most rapidly fatal cases (those dying within 15 hours of onset) there are no signs of meningeal irritation, and the spinal fluid is clear In the less rapid cases there is usually slight neck rigidity with flaccidity elsewhere, and the spinal fluid is turbid and contains meningococci Blood-cultures nearly always yield a profuse growth of meningococci In our experience the morbid histology characteristic of this fulminating cerebral type is an early encephalitis, with or without meningitis The encephalitis affects some portions of the brain more than others Sections of the brain show intense congestion and œdema with multiple small hæmorrhages around the small blood-vessels and widespread capillary thrombosis (figs 1 A and B) There is no perivascular or meningeal infiltration in the most rapidly fatal cases, but in others not so rapid both are present The perivascular infiltration is then always slight and usually limited to a single ring of mononuclear cells In addition to the vascular lesion the nerve-cells show acute degenerative changes, including loss of nuclei and chromatolysis

These findings indicate an overwhelming toxic effect on the brain rather than a bacterial invasion , there is little evidence of actual multiplication of organisms within the brain This type of infection contrasts strikingly with the ordinary form of meningococcal disease, where the organism produces its effect by multiplication within the meninges and occasionally in other tissues Such wholly different reactions to infection with the same kind of organism are well known to the experimental pathologist Massive doses of organisms of high virulence often produce in laboratory animals a rapid lethal effect which is strikingly different from the ordinary course of the infection produced by injection of ordinary doses of organisms of moderate virulence Fulminating encephalitis, in our experience, was only seen from late January to early April, 1940, when the epidemic was in its most virulent phase and opportunities for mass infection were highest We conclude, therefore, on clinical, pathological and epidemiological grounds, that fulminating encephalitis is a rare clinical form of meningococcal infection produced by the overwhelming toxic effect of massive doses of the most highly virulent organisms in the most susceptible subjects, especially infants

FULMINATING ENCEPHALITIS

CASE 1 —A male child, aged 11 months, admitted at 6 P M on Feb 23, 1940, with a history of fretfulness, vomiting and diarrhœa for 24 hours Pale and collapsed Temperature 97° F , pulse rate 130, respirations 70 Chest clear No rigidity Three hours later, cyanosis, rapid laboured respirations and a macular and petechial rash on trunk and limbs , two green stools passed During the night, rapid deterioration and complete coma, with loss of swallowing reflex , pulse uncountable , T 104° F , dyspnœa and cyanosis , no meningeal signs , tendon reflexes absent , spasm of masseters , eyes rotated upwards and divergent squint , pupils reacting , no convulsions Died 13 hours after appearance of rash

Medical News

University of Cambridge

The titles of the degrees of M B , B Chir have been conferred on Mrs A Davies

On Feb 6 the following degrees were conferred —

M D—W H Valentine and E T C Spooner

M B , B Chir—* E V Hope, * S L Melville, * G C Franklin, * A H Rea, * Noel Gillman, and G F Purves

* by proxy

Society of Apothecaries of London

The following having completed the final examination of the society have been granted its diploma entitling them to practise medicine, surgery and midwifery —

C N d'E Eastes, Guy's; J T Hemmingway, Anderson Coll , Glasg , S A MacDonald, St Thos , G O Kennedy, Guy's , R L Shea, Guy's , and C R Deuchar, Dubl

Medical Superintendents Society

A meeting of the main executive committee of this society will be held at the Midland Hotel, Derby, on Saturday, Feb 21 at 11 45 A.M It will be followed by the annual meeting of the Midland branch at 2 30 P M.

Glasgow Medico-Chirurgical Society

At a meeting of this society to be held on Wednesday, Feb 18, at 7 30 P M in the Lister theatre of Glasgow Royal Infirmary, Mr Norman Dott will speak on brain surgery in Britain, 1939–41

Medical Casualties

In a recent casualty list the following R A M C officers have been posted as wounded W S/Captain Leonard Bapty, M B Aberd , W S/Captain A R Duff, M B Edin , and T/Major W G Macfie, M B Glasg

Nutrition Society

This society will hold a conference on food production and distribution in relation to nutritional needs on Saturday, Feb 28, at the Dunn Nutritional Laboratory, Milton Road, Cambridge Sir Wilson Jameson will take the chair at 10 A M , and those who will read papers include, Sir John Orr (the agricultural implications of a food policy based on nutritional needs), Mr N C Wright, D Sc (rival claims of animals and man for food), Mr E T Halnan (animals as food-converters) and Sir John Russell, F R S (planning for agricultural production) Provisional arrangements have been made for further meetings when the preparation of food in war time and nutritional requirements for optimal health will be discussed

Royal Sanitary Institute

A meeting of the institute will be held at the Nuffield Institute of Clinical Research, Oxford, on Saturday, Feb 28, at 10 A M , when Mr H H Crawley, A M Inst C E , deputy water engineer for the borough, will speak on the storage of emergency drinking supplies Mr Stewart Swift, chief sanitary inspector and evacuation officer for the borough, will describe the administration of the Government evacuation scheme, and Dr H C Jennings, county medical officer of health will open a discussion on the scheme Further information may be had from the local secretary for the meeting, Dr G C Williams, Greyfriars, Paradise Street, Oxford

Royal Society of Medicine

The section of comparative medicine of this society will meet on Wednesday, Feb 18, at 2 30 P M , for the third discussion in the series on the control of diseases of cattle inimical to man, when Mr A W Stableforth, D Sc , Dr V D Allison and Mr S L Hignett will speak on mastitis and streptococcal infection At 2 30 P M , on the same day, the section of psychiatry has arranged a symposium on the assessment of mental responsibility with special reference to the armed forces Those taking part will include Brigadier H Shapcott, Air Commodore H L Burton, M B , Surgeon Lieut -Commander E W Anderson and Major E A Bennet On Feb 19, at 2 30 P M , at the section of neurology, Dr J G Greenfield, Major Ritchie Russell and Dr J Hamilton Paterson will open a discussion on cerebral œdema On Feb 20, at 2 30 P M , short papers will be read at the section of obstetrics and gynæcology, and at the same time at the section of physical medicine Dr J L Halliday is opening a discussion on the psychological aspect of rheumatoid arthritis The section of orthopædics will meet on Feb 21 at 11 15 A.M , at the Royal National Orthopædic Hospital, Brockley Hill, Stanmore

Chadwick Lectures

The following lectures have been arranged by the Chadwick Trust for the coming months Tuesday, Feb 24, at 2 30 P M., Mr W G Culpin, F R I B A , reconstruction after the war (at 26, Portland Place, London, W 1) , March 17, 2 30 P M , Dr W A Brend, nervous shock in peace and war (*London School* of Hygiene, Keppel Street, W C 1) , April 14, 2 30 P M , Mr D C Graham, M Inst C E , dangers from rainfall in urban areas (Royal Sanitary Institute, 90, Buckingham Palace Road, S W 1) , May 12, 2 30 P M , Dr Alison Glover, the school medical service in war-time (26, Portland Place, W 1) , June 18, 4 P M , Mr E Augustus Bowles, plants in relation to food, medicine, or poison (Chelsea Physic Garden, Swan Walk, S W 3) Further particulars of these lectures may be had from the secretary of the trust, 204, Abbey House, Westminster, S W 1

Thanks a Lot

Mr Ernest Brown has written to thank the American Ambulances of Great Britain for the help they are giving us Up to the end of November the fleet of ambulances, which reached its full complement of some 270 vehicles last August, had travelled over three million miles At present it carries about 2500 hospital patients a week, and also provides speedy transport for teams of consultants and for the blood transfusion services Surgeon Rear Admiral G. Gordon-Taylor who is on a visit to America has also paid a tribute to the work of the service, especially for its help in salvaging the Hunterian collection when the College of Surgeons was bombed last year

Births, Marriages and Deaths

BIRTHS

ABRAHAM —On Feb 3, at Harpenden, the wife of Surgeon Lieutenant J O G Abraham, R N V R —a daughter

COOPE —On Feb 6, the wife of Dr Robert Coope, of Liverpool—a son

COUTTS —On Feb 1, at Chesham Bois, Bucks, the wife of Lieut Colonel J C Coutts R A M C—a son

CRAIG —On Feb 5, the wife of Dr J W Craig, of Haslemere—a son

EVANS —On Feb 2, to Dr Barbara Evans (née Hay-Cooper) wife of Dr Philip Evans of Anstye, Cuckfield, Sussex—a son

NEILL—On Feb 2, at Leicester, the wife of Captain J H Neill, R A M C —a daughter

RIDLEY —On Feb 8 at Woking, the wife of Mr Harold Ridley, F R C S —a daughter

SHARP —On Feb 6, at Epping, the wife of Dr Edward Sharp—a son

MARRIAGES

CADMAN—HAWKINS —On Feb 7, at Wellington Shropshire, Donald Spencer Cadman, M B to Mary Sylvia Hawkins

HENDERSON—MORTON —On Feb 7, at Warblington, Hampshire, Peter Wallace Henderson, B M , to Stella Dolores Morton B M

JOHNSTON—PETERS —On Jan 28, at Basingstoke Charles Leslie Johnston M R C S , to Kathleen Peters

THOMSON—STEWART —On Jan 31, in London, Colin Thomson, M B , Captain R.A M C , to Lesley Isabel Stewart, M B , flying officer, R A F

VAN DE LINDE—GIBSON —On Feb 7, at West Horsley, Patrick Van de Linde, M B , to Annie Brayshay Gibson

DEATHS

CATO —On Jan 30, at King's College Hospital, Alexander McLean Cato M R C S of Stanstead Road, Forest Hill, London, S E 23

JOHNSTON —On Feb 1, at Strabane, N Ireland, William Thomas Johnston, M D R U I lieut colonel, R A M C , retd

MACKEITH —On Feb 5, at Church Hill, Aldershot, Malcolm Henry MacKeith, D M OXFD, M.R C P , aged 46

MORLEY —On Feb. 3 Frank Morley, M R.C S , L.D S , of Randolph Crescent Maida Vale

ROBINSON —On Feb 7, at West Byfleet, William Moore Skipworth Robinson F R C S E

STATHERS —On Feb 6 at Brackley, George Nicholson Stather , M R C S , D P H aged 84

WOODCOCK —On Feb 3, at Hove, Sussex, Harold Brookfield Woodcock, M B E , M B MANC

Appointments

AYRES, G W , M B LOND examining factory surgeon for Chippenham, Wilts

BURGES, R C L M B CAMB examining factory surgeon for Birmingham North

D'AMIAN, ELSE A L R C P E temp asst M O H for Rawtenstall

PARIKH, STELLA A , M B. LOND asst M O at Hastings Municipal Hospital

PATTERSON ELEANOR, M B B HY DURH , D P H , temp asst M O H and asst school M O for Reigate

SWAN J F , M B. GLASG , D P H , D R C O G asst M O H for Manchester

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export

ORIGINAL ARTICLES

MENINGOCOCCAL ENCEPHALITIS

H STANLEY BANKS,
M D GLASG , D P H
MEDICAL SUPERINTENDENT OF THE PARK HOSPITAL, L C C

J E McCARTNEY,
M D D SC EDIN
MAJOR R.A M C , DIRECTOR OF RESEARCH AND PATHOLOGICAL SERVICES, L C C

(*Illustrative plate*)

Two recent events have contributed to a clearer understanding of the pathogenesis of meningococcal infection These are the step up in virulence and massive infection associated with the high epidemic prevalence of 1940 and 1941 , and the rapid clearing of organisms from the blood-stream and the meninges (that is, the rapid cure of the septicæmia and meningitis) produced by the sulphonamide drugs The first factor, acting especially near the peak of the epidemic in February and March of each year, produced an unusual number of fulminating and severe acute cases for study The second factor provided a means of investigating causes of death other than septicæmia and meningitis, for in most of the fatal cases, except the most rapid fulminating types, both the septicæmia and the meningitis had been largely cleared up by chemotherapy by the time the patient died These investigations have added to our knowledge of the incidence, nature and extent of encephalitis and also of adrenal lesions in meningococcal disease In this paper we indicate our findings in encephalitis and illustrate the main clinico-pathological types with representative case-histories and microphotographs The subject has already been briefly discussed by one of us (Banks 1940)

Netter and Debre (1911) summarised the early histological studies of meningococcal disease (Klebs 1877, Strumpell 1889, Hagelstam 1893, Flexner and Barker 1894, Councilman, Mallory and Wright 1898) In acute cases they described no conspicuous change in the brain tissue except congestion and œdema and occasionally vacuolisation and chromatolysis of the nerve-cells in the marginal areas close to the meninges They stated that the essential character of cerebrospinal meningitis is the limitation of inflammatory lesions to the meninges and the integrity of the subjacent nervous tissue It was early recognised that purulent meningeal exudate might sometimes dip right down into the sulci and extend some distance into the brain or cord as a perivascular infiltration around the larger vessels, but this was a direct extension of the inflammatory process from the meninges rather than a true encephalitis Boyd (1940) refers to the brain as being " curiously intact " These views have permeated the whole of the literature, and little attention appears to have been given to the histology of the brain in meningococcal meningitis for many years Encephalitis is just mentioned, however, in the larger textbooks, where it is stated that scanty foci of cellular infiltration, suppuration or hæmorrhage have occasionally been found Foster and Gaskell (1916) noted a case with deepening coma leading to death in about 5 days, in which there were perivascular hæmorrhages in the cord and cortex of the brain , and Worster-Drought and Kennedy (1919) found in a similar case, dying on the 7th day of illness, an area of softening beginning in the base and encroaching on the head of the caudate nucleus A recent example of a much more extensive meningococcal perivascular encephalitis is described by Jonesco-Sisesti and Stroesco (1939) In none of these isolated observations is any clinicopathological correlation attempted. Clearly the ordinary form of meningococcal disease is pre-eminently a meningeal infection with occasional scanty involvement of the cerebral tissue itself

During the epidemic of 1940–41 we observed a number of cases of meningococcal infection quite different from the ordinary form These were both fulminating and acute

Fulminating Cases

The fulminating cases were invariably fatal within 24 hours, and were generally divisible into two types—a cerebral or encephalitic type and an adrenal type—though a mixture of the two was also met with The adrenal type has long been recognised, but its description (the so-called Waterhouse-Friderichsen syndrome) is that of a mixture of types and even of infections

The pure *fulminating adrenal type* is characterised by sudden onset of fever, rapid deterioration, vomiting, a generalised petechial rash with some larger purpuric elements appearing within a few hours of onset, and the development of grave hypotension with cyanosis The mental condition is relatively unclouded and may be clear to the end, but only when the infection is restricted to septicæmia with adrenal hæmorrhage If there is meningitis the patient tends to become irrational or delirious, and if there is encephalitis he becomes stuporose and later deeply comatose

The *fulminating cerebral type* may be similar in onset and progress up to the development of the rash, or may even begin with coma The rash does not usually exhibit the larger purpuric elements, and hypotension does not develop, but stupor and coma always come on quickly The coma rapidly deepens until there is no response to painful stimuli Respirations become frequent and laboured, grunting or stertorous, but are not associated with pneumonic signs Cyanosis is usual In the most rapidly fatal cases (those dying within 15 hours of onset) there are no signs of meningeal irritation, and the spinal fluid is clear In the less rapid cases there is usually slight neck rigidity with flaccidity elsewhere, and the spinal fluid is turbid and contains meningococci Blood-cultures nearly always yield a profuse growth of meningococci In our experience the morbid histology characteristic of this fulminating cerebral type is an early encephalitis, with or without meningitis The encephalitis affects some portions of the brain more than others Sections of the brain show intense congestion and œdema with multiple small hæmorrhages around the small blood-vessels and widespread capillary thrombosis (figs 1A and B) There is no perivascular or meningeal infiltration in the most rapidly fatal cases, but in others not so rapid both are present The perivascular infiltration is then always slight and usually limited to a single ring of mononuclear cells In addition to the vascular lesion the nerve-cells show acute degenerative changes, including loss of nuclei and chromatolysis

These findings indicate an overwhelming toxic effect on the brain rather than a bacterial invasion , there is little evidence of actual multiplication of organisms within the brain This type of infection contrasts strikingly with the ordinary form of meningococcal disease, where the organism produces its effect by multiplication within the meninges and occasionally in other tissues Such wholly different reactions to infection with the same kind of organism are well known to the experimental pathologist Massive doses of organisms of high virulence often produce in laboratory animals a rapid lethal effect which is strikingly different from the ordinary course of the infection produced by injection of ordinary doses of organisms of moderate virulence Fulminating encephalitis, in our experience, was only seen from late January to early April, 1940, when the epidemic was in its most virulent phase and opportunities for mass infection were highest We conclude, therefore, on clinical, pathological and epidemiological grounds, that fulminating encephalitis is a rare clinical form of meningococcal infection produced by the overwhelming toxic effect of massive doses of the most highly virulent organisms in the most susceptible subjects, especially infants

FULMINATING ENCEPHALITIS

CASE 1 —A male child, aged 11 months, admitted at 6 P M on Feb 23, 1940, with a history of fretfulness, vomiting and diarrhœa for 24 *hours* Pale and collapsed Temperature 97° F , pulse rate 130, respirations 70 Chest clear No rigidity Three hours later, cyanosis, rapid laboured respirations and a macular and petechial rash on trunk and limbs , two green stools passed During the night, rapid deterioration and complete coma, with loss of swallowing reflex , pulse uncountable , T 104° F , dyspnœa and cyanosis , no meningeal signs , tendon reflexes absent , spasm of masseters , eyes rotated upwards and divergent squint , pupils reacting , no convulsions Died 13 hours after appearance of rash

Autopsy—Profuse hæmorrhages throughout skin, pericardium, pleura and peritoneum, hæmorrhagic double pleural effusion, no pneumonia, no suprarenal hæmorrhage Brain showed much congestion and œdema, no meningitis Section of cortex showed great congestion and œdema, widespread capillary thrombosis, a few capillary hæmorrhages and some perivascular hæmorrhage (figs I A and B) Some early perivascular infiltration with a few mononuclear cells Many nerve cells showed cloudy swelling, chromatolysis and loss of nuclei (No examination for meningococcus was made in this case because the whole acute phase of the illness took place during the night)

FULMINATING ENCEPHALITIS AND MENINGITIS

CASE 2 —A male child, aged 5 months, admitted at 8 P M on Jan 21, 1941 Had refused food at noon and passed a loose stool, at 2 P M spots had appeared on buttocks, thereafter, rapid deterioration On admission, profuse purpuric rash on face, trunk and limbs, with large blotches, complete coma, cyanosis, loss of swallowing reflex and response to all stimuli, respirations 100 and laboured, no pneumonia, neck slightly rigid, fontanelle tense and pulsating and unchanged by two lumbar punctures Cerebrospinal fluid pressure slightly increased, cells 1080 per c mm, meningococci group I present Fluids were given by stomach tube, with sodium sulphapyridine 0 5 g intramuscularly 3-hourly and 60 c cm meningococcus antitoxin intraperitoneally Died 7 hours after admission Course from onset to death 15 hours

Autopsy—Fontanelle and sutures tense, brain soft and very œdematous, slight meningeal exudate at base Section of cortex showed much congestion and œdema, early capillary thrombosis, scattered small hæmorrhages and around some vessels a fine mononuclear infiltration with a few polymorphs, acute degenerative changes in nerve cells

FULMINATING ENCEPHALITIS, MENINGITIS AND ADRENAL HÆMORRHAGE

CASE 3 —A boy, aged 4 years, admitted at noon on April 10, 1940, with diagnosis of pneumonia Shivering and vomiting began at 4 P M on April 9, followed by delirium, coma and stertorous breathing during the night Purpuric spots seen 3 hours before admission On admission, profuse generalised purpuric rash with blotches ½ in in diameter, absolute coma, with loss of swallowing reflex, *cyanosis and stertorous* breathing, pulse imperceptible, no pneumonia, no neck rigidity, Kernig negative, tendon reflexes absent CSF pressure moderately raised, cells 4000 per c mm, meningococci group I Given sodium sulphapyridine, 1 g, intravenously Generalised convulsions set in, died 2 hours after admission

Autopsy—Hæmorrhages into skin and serous membranes Right adrenal contained hæmorrhage 5 mm in diameter, left adrenal deep purple Meninges showed slight purulent exudate over vertex and base, brain extremely congested and œdematous Section of cerebral cortex much congested, with diffuse capillary thrombosis and widespread gross œdema (fig II), perivascular infiltration in a number of larger vessels near a sulcus, degenerative changes with necrosis of some nerve cells Sections of right adrenal showed hæmorrhage occupying three quarters of the gland, and of left adrenal *some hæmorrhage with focal necrosis of cortical cells*

Acute Cases

A widespread encephalitis occurs not only in fulminating but also in some rare acute cases In the former death takes place within 24 hours and there is little or no meningitis In the latter death commonly occurs in 5–7 days and there is always purulent meningitis, the condition is an acute encephalomeningitis Any variation may be seen from the fulminating case which dies in 6 hours from onset to the subacute case which dies in 3 weeks, like that of Jonesco-Sisesti and Stroesco The acute encephalitic case, like the fulminating, may occasionally be complicated by adrenal hæmorrhage, and in addition there may be time for other focal inflammatory lesions to develop —for example, pericarditis (case 7) or arthritis (case 5) Case 4, which was fatal in 40–48 hours from onset, is an example of an intermediate type between fulminating and acute

The outstanding clinical sign which is added to the meningeal signs in the acute encephalomeningitic type is deep coma, usually appearing within 36 hours of onset The coma deepens progressively until there is no response to stimuli The swallowing reflex may be abolished, or nearly so Other distinctive clinical features are (1) rapid laboured or stertorous, and later irregular, breathing with absence of physical signs of pneumonia, (2) cyanosis, (3) contracted pupils, (4) incontinence of urine and fæces, (5) relatively slight neck rigidity, sometimes even associated with general flaccidity, (6) slight papillœdema, (7) an extensor plantar reflex In our cases seen during the epidemic there was *no rash*, but there was a sparse petechial rash in case 7, seen in January, 1937 The spinal fluid is always purulent and contains meningococci of group I These cases are almost invariably fatal and correspond roughly to the "acute fatal type" of former writers We record, however, one recovery (case 6), in which the diagnosis of encephalitis was confirmed by the appearance of a phase of parkinsonism for about a fortnight after recovery of consciousness

The morbid histology of the acute encephalomeningitic case which has been treated with sulphonamides is as a rule that of a clearing meningitis and a well-marked and widespread perivascular encephalitis in certain regions Besides congestion of the brain and cord there are, in *many parts, capillary thromboses with perivascular* cuffing and numerous small hæmorrhages In the centre of a hæmorrhage a thrombosed capillary may sometimes be seen (fig IV B) In the more quickly fatal cases, such as case 4, the perivascular cuffing is narrow and mainly mononuclear Where death is postponed for a few days there are in addition broad zones of polymorphonuclear and large mononuclear cells around some of the larger as well as the smaller vessels, together with perivascular hæmorrhage, fibrin deposition and even myelin destruction The cuffing may occasionally amount to perivascular abscess This was well seen in case 7, which occurred before the introduction of sulphonamide treatment Here the cuffing is almost entirely polymorphic and there is a relative paucity of small and large mononuclears, an indication of a reaction to an active growth of organisms In the sulphonamide-treated cases, on the other hand, the broad zones of polymorph cuffing are fewer and contain a relatively high proportion of large mononuclears, an indication of some check on the vascular growth of organisms (figs IV C and D) Though we used suitable *stains* we have been unable to demonstrate meningococci in the perivascular cuffing of the sulphonamide-treated cases These vascular and perivascular lesions are scattered regionally at various levels of the brain and cord They seem to be most common in the neighbourhood of the basal ganglia, midbrain, medulla and upper cord, but are also present in some parts of the cortex It is only the more advanced lesions that can be seen with the naked eye, and the condition is easily missed at necropsy unless a careful histological examination of different levels of the central nervous axis is made The lesions appear to be the result of two types of reaction First, there is the toxic effect of a massive dose *of virulent organisms producing* widespread hæmorrhage, œdema and capillary thrombosis, as in fulminating cases Secondly, there is the inflammatory reaction produced by the organisms themselves as they multiply for a time in the vessels If the disease lasts several days, and if the case is not immediately treated with a sulphonamide, broad zones of polymorphs are formed which may later be partly absorbed or replaced by large mononuclears The effect of chemotherapy is to clear up partially the inflammatory reaction in the meninges and brain and thus to reveal the cerebral damage caused by the initial onslaught of the virulent organisms

ACUTE WIDESPREAD ENCEPHALOMENINGITIS

CASE 4 *Rapid type, intermediate between fulminating and acute*—A man of 45, admitted at 9 P M on Sept 4, 1940, having been found unconscious 4 hours before On admission was in deep coma with only faint response to gross stimuli, swallowing limited and difficult, cyanosis and stertorous breathing, no pneumonia, pinpoint pupils, T 100° F, pulse rate 120, respirations 28 Blood pressure 110/100 mm Hg Tendon reflexes increased, plantar reflexes extensor, no rash, *slight neck rigidity, blood sugar* 109 mg per 100 c cm CSF turbid, pressure raised, meningococci grew Given sodium sulphathiazole, 2 g, intravenously, then 1 5 g by stomach tube 4 hourly, 5% glucose saline rectally by continuous drip Next morning, still deep coma and stertor and not swallowing. CSF showed meningococci in films but not in culture. Died at 6 P.M., 25 hours from onset of coma, and 30–48 hours from onset of disease.

Autopsy.—Lungs congested, no pneumonia. Brain showed great tension in dura, purulent meningeal exudate over vertex and slight at base, deep congestion of white matter. Sections of cortex, basal ganglia, midbrain and medulla showed much congestion, œdema, scattered capillary thrombosis and a widespread fine infiltration around the smaller vessels with mononuclears and occasional scanty polymorphs (fig III A and B). In the midbrain there was a small area of purulent infiltration near the corpora quadrigemina, many of the larger vessels near the meninges showed polymorph perivascular cuffing, probably by direct extension from the meninges.

CASE 5.—A man of 22, admitted at midnight on Feb. 25, 1940. Onset 3 days before, coma for 36 hours. On admission was in deep coma with no response to stimuli and not swallowing, neck rigidity and Kernig present, tendon reflexes exaggerated, abdominal absent, pupils equal and reacting, arthritis right wrist with fluid in the joint, no rash, T. 100·4° F., pulse rate 90, respirations 26. CSF 15,700 cells per c.mm., meningococci group I in films and culture. Given sodium sulphapyridine, 2 g., intravenously, followed by 2 g. intramuscularly 4-hourly during the night, glucose saline, 500 c.cm., intraperitoneally. Next morning coma still very deep, but swallowing with difficulty, drug and fluids by mouth, hiccough present. In evening coma still deep, T. 102·8° F., pulse rate 120, respirations 44, no pneumonia. CSF 24,000 cells, no organisms. Died 30 hours after admission, after 66 hours of deep coma and in 5th day of disease.

Autopsy.—All organs including adrenals congested, no pneumonia, meningeal exudate slight and only at base, brain tissue deeply congested with some areas of softening. Sections of cortex showed congestion, œdema, widespread capillary thrombosis, numerous hæmorrhages scattered regionally, some showing a thrombosed capillary in the centre, and broad polymorphic and large mononuclear perivascular cuffing around some of the larger vessels deep in the brain tissue (figs IV A, B, C, D). Many of the smaller vessels showed a fine mononuclear perivascular infiltration.

CASE 6. *Recovered*.—A girl of 15, admitted on Sept. 25, 1940. Delirium and coma came on 4 hours after onset of headache and vomiting, taken to general hospital during severe air-raids and given 1 g. sodium sulphapyridine intramuscularly, no further drug given owing to air raids till admitted to Park Hospital 27 hours later. On admission absolute coma with loss of swallowing reflex and all response to stimuli, incontinent, mouth and tongue dry and dirty, skin dry, dehydrated, neck rigid but otherwise general flaccidity, cyanosis, stertorous breathing, no pneumonia, pupils contracted, no rash, left 6th nerve paresis, pulse rapid. CSF purulent, meningococci group I in films and culture. Given 2 g. sodium sulphathiazole intravenously, followed in 3 hours by 1·5 g. 4-hourly by stomach tube, continuous drip rectal saline and fluids by tube. Next day still in absolute coma and unable to swallow. CSF 17,000 cells, no organisms. On 27th coma was still deep and she was unable to swallow, but showed faint response to gross stimuli, all fluids and drug given by tube for 48 hours. Next day able to swallow, but not to speak, double 6th nerve palsy, blurring of edges of optic discs and slight papillœdema. On Sept. 30 rational, with slow cerebration. Completely immobile expression. Able to close her eyes, tendon reflexes brisk and slight ankle clonus, plantars now flexor.

From Oct. 3 to Nov. 1 a series of photographs taken while she attempted to smile show clearly the parkinsonian mask (fig VII *a*, *b* and *c*). These show also slight right upper neurone facial paresis. The striking effect was the absence of emotional expression. This was considered to indicate a lesion of the midbrain, probably an encephalitis. The mask like expression partially cleared up after 2–3 weeks (fig VII *c*) and wholly cleared in five weeks (fig VII *d*), but the right 6th nerve paresis persisted for nearly 4 months (fig VII *d* and *e*).

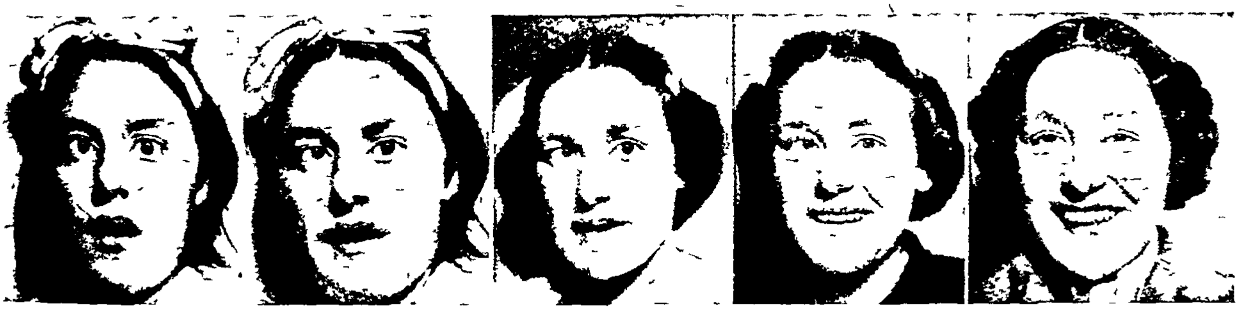


FIG VII.—Recovered acute encephalomeningitis showing transient parkinsonism. Case 6. (*a*) 9th day of disease, face in repose, bilateral VI nerve paresis. (*b*) Same day, trying to smile, slight paresis of right VII (upper neurone). (*c*) 17th day, trying to smile, paresis of right VI and slight paresis of the right VII. (*d*) 38th day, expression normal, paresis of right VI. (*e*) 4 months after onset, normal.

ACUTE ENCEPHALOMENINGITIS, ADRENAL LESIONS AND PURULENT PERICARDITIS

CASE 7. *Not treated with sulphonamides*.—A man of 24, admitted Jan. 27, 1937. Diagnosed as influenza. Sudden shivering, vomiting, pains and cough 24 hours previously, followed by severe headache and delirium. On admission pale, sweating, delirious, T. 100·4° F., pulse-rate 136, respirations 36, no pneumonia. Next day, sparse petechial eruption on trunk, neck rigidity, extensor plantar response, and noisy delirium with tendency to stupor but not coma. CSF purulent, meningococci group I. Blood-culture negative. Meningococcus antitoxin given, 60 c.cm. intravenously and 30 c.cm. intrathecally. By evening, condition grave, cyanosis, stuporous but could be roused, serum repeated. On Jan. 29 pulse rate 144 and later uncountable, respirations 70, T. 105·6° F. Died on Jan. 30, on 4th day of disease, 34 hours after serum treatment was begun.

Autopsy.—Purulent meningitis with some softened areas in the brain, and purulent pericarditis. Two out of three sections of brain at different levels showed numerous capillary hæmorrhages with congestion and œdema but only slight capillary thrombosis, broad zones of perivascular polymorph cuffing with deposit of fibrin and hæmorrhage around many of the larger vessels deep in the brain tissue (fig V). The smaller vessels showed no evidence of mononuclear infiltration. Section of adrenal showed some hæmorrhage following the course of a large thrombosed vessel, with numerous areas of necrosis in cortex and medulla, probably in the parts supplied by the thrombosed vessel. (In this case the cerebral lesions were more inflammatory than toxic and there was also bacterial invasion of the pericardium and possibly of the adrenal.)

Focal Encephalomyelitis

There is another quite different type of acute case characterised by a limited focal encephalomyelitis, together with purulent meningitis. Such cases at first resemble clinically the ordinary form of meningitis. They are always severe but lack the deep coma which is characteristic of widespread encephalitis, tending rather to stupor, semicoma and delirium, like many cases of the ordinary form of meningitis. In response to sulphonamide therapy, however, they do not clear up satisfactorily within two or three days. The clinical picture varies widely. The patients may be delirious and restless on several successive nights with rational intervals in the daytime, and then suddenly collapse and die even during a lucid interval (case 8). Young children may suddenly develop convulsions after a day or two and die in a few hours, in spite of the clearing up of the meningitis (case 9). These cases may even simulate the widespread acute encephalomeningitic type if a subdural or extradural hæmorrhage produces acute intracranial pressure and coma (case 10) Post mortem, no satisfactory cause of death may be found in these cases on macroscopic examination, since the meningitis may have almost cleared up as a result of sulphonamide therapy It is only on careful histological examination of various levels of the brain and cord that a few areas of *focal encephalomyelitis consisting chiefly of small hæmorrhages* are found, mostly in the region of the basal ganglia, midbrain, medulla and upper cord (figs VI A and B) This limited lesion of brain and cord occupies an intermediate position between the widespread encephalomeningitis and the ordinary form of meningitis In some cases it seems to be limited to small hæmorrhages, in others, capillary thrombosis is also seen In presulphonamide days, the small foci of suppuration occasionally found in the brain may have been a development of such lesions. When they have not proceeded to suppuration, the lesions are likely to be missed at autopsy unless a systematic histological examination of various levels of brain and cord is made

MENINGITIS WITH FOCAL ENCEPHALOMYELITIS

CASE 8 —*A boy of 18, admitted on Feb 3, 1941*, with 24 hours' history of illness Neck rigidity, noisy delirium and drowsiness but not coma CSF 27,800 cells, meningococci group I Given sulphathiazole 2 g, then 1 5 g 4 hourly In next 2 days improved greatly, but vomited three times and was noisy and restless each night, though rational by day On Feb 6 rational, able to lift head from pillow, suddenly at 2 30 P M became unconscious with dilated fixed pupils, pulseless, respirations 6 per min, died in 5 min

Autopsy —Right heart failure, congested liver, enlarged thymus, meningeal exudate slight and only in the sulci and over vermis of cerebellum, brain and cord congested Sections showed scattered focal hæmorrhages in cerebellum, basal ganglia, midbrain, and cervical and thoracic cord, especially numerous in cervical cord (fig VI B) Also perivascular hæmorrhage in midbrain, no perivascular infiltration noted Lower medulla not sectioned, but the extensive focal hæmorrhages in cervical cord suggested that it could hardly have escaped

CASE 9 —A male child, aged 7 months, admitted April 25, 1941, 24 hours from onset of fretfulness, refusal of food, vomiting and diarrhœa On admission, neck rigid, occasional vomiting, generalised petechial rash, fontanelle tense CSF turbid, meningococci grew Given sulphathiazole, 0 5 g, 4 hourly by mouth Next day took feeds fairly well and vomited once Suddenly collapsed 40 hours after admission, coffee ground vomit, gentle clonic convulsions, dilated pupils and deep coma Fundi showed congested veins BP 98/40 mm Hg CSF 2840 cells per c mm and scanty meningococci in films but not in culture, sulphathiazole content 6 3 mg per 100 c cm Convulsions and coma continued till death 8 hours later

Autopsy —Scanty meningeal exudate in sulci, cerebellum, optic chiasma and lateral ventricles, brain and cord congested and very œdematous, extradural hæmorrhage in thoracic cord Adrenals normal Sections of cerebral cortex, cerebellum, medulla, thoracic and lumbar cord showed only congestion and œdema, in basal ganglia at region of internal capsule there was, in addition, capillary thrombosis, a few small capillary hæmorrhages, perivascular hæmorrhage and slight perivascular cuffing (fig VI B) This focal encephalitis was taken to be the cause of death

MENINGITIS WITH SLIGHT FOCAL ENCEPHALITIS AND LARGE SUBDURAL HÆMORRHAGE

CASE 10 —A boy of 19, admitted April 18, 1941, 30 hours after onset On admission had been comatose 11 hours, but responded with groans to gross stimuli and swallowed with difficulty Right pupil semidilated and did not react to light except through the consensual reflex, stertorous breathing, pulse full, rate 132, T 99° F, respirations 28, tongue dry, moderate neck rigidity, retention of urine, no rash CSF purulent, pressure over 300 mm, cells 40,000 per c mm, meningococci in films and culture Given sulphathiazole intravenously and by mouth Next day, right facial paresis, no papillœdema, BP 140/100 mm Hg, slight glycosuria and acetonuria, breathing stertorous and irregular, pulse full On April 20 still deep coma and stertor, swallowing reflex lost CSF faintly salmon pink, cells 12,000, meningococci in films but not in culture Fluids and drug given by stomach-tube, and 1000 c cm saline intravenously, in afternoon seemed to improve and spoke few indistinct words On April 21 relapse into deep coma with profuse sweating, extensive herpes covered half of face CSF still tinged faint pink, high pressure, cells 5300, meningococci in films but not in culture Blood urea 52 mg per 100 c cm, blood sugar 125 mg per 100 c cm On April 22 coma absolute, swallowing and pupillary reflexes absent, stertor, sweating, pulse weak, generalised convulsions, T 107° F, death 5 days after onset

Autopsy —Subdural hæmorrhage 2 in in diameter over left temporal region, very scanty purulent exudate on base of brain and in ventricles, brain and cord congested and œdematous Sections of cortex, basal ganglia, midbrain, pons and medulla showed congestion and œdema, and in addition a hæmorrhage was seen in midbrain

Marginal Encephalitis

Passing to the ordinary form of meningitis, we find examples with perivascular polymorphic infiltration around the larger vessels in the brain only in the neighbourhood of the meninges When there is no evidence of encephalitis in any other part of the brain it is almost certain that these foci are the result of extension of exudate along vessel sheaths from the meninges Meningococci are more easily demonstrated in these lesions than in those of true encephalitis Clinically these cases are mostly severe examples of the ordinary form of meningitis with particularly heavy purulent meningeal exudate but marginal and true encephalitis may be present together (cases 3 and 4) Lastly, even in cases which are regarded as the ordinary form of meningitis itself it is not true to say that the brain is absolutely intact, careful search of brain sections occasionally reveals a few examples of slight capillary hæmorrhage and thrombosis

SCHEME OF FULMINATING AND ACUTE FORMS

FULMINATING

Bacteriæmia or septicæmia Purpuric rash Meningitis absent or beginning	*Combined with one of the following* Adrenal lesions Encephalitis * Adrenal lesions and encephalitis

ACUTE

Bacteriæmia or septicæmia Eruption present or absent Purulent meningitis	*Combined with one of the following* Widespread encephalitis * Widespread encephalitis * with adrenal lesions Focal encephalomyelitis Marginal encephalitis by extension from the meninges Ordinary form of meningitis

* Myelitis may also be present The cord was not examined in the earlier autopsies

Discussion

The case-histories recorded here are, with one exception, taken from the epidemics of 1940–41 Meningococcal encephalitis may however appear in non-epidemic years at the period of highest prevalence On looking through our records for 1937–39, we found at least 7 cases out of approximately 150 in which encephalitis may have been present All these cases occurred in the period from January to May of each year, and most of them in March when the virulence and massive dosage of the organisms were highest In most cases autopsies were performed without encephalitis being suspected From only one of them (case 7, the case not treated with sulphonamides) are brain sections still available These show the gross brain lesions mentioned in the case-record and which we take to be mainly inflammatory rather than toxic This reaction may be due partly to lower virulence of the meningococcus in 1937 and partly to the absence of sulphonamide action

These 10 cases and others in our experience suggest the following as factors in the pathogenesis of the disease The meningococcus invades meningeal or cerebral vessels and thence reaches the subarachnoid space In the ordinary form of meningitis there is little or no recognisable brain lesion, beyond an occasional odd example of capillary thrombosis When the organisms are highly virulent and the dose massive, as when an epidemic is nearing its height, cases are found in which the invasion of the brain and cord is of much greater intensity and range The following three main degrees of this invasion can be recognised as distinct clinico-pathological syndromes

The first, the most intense, and probably the most rare, is a fulminating encephalitis, without or with meningitis Clinically this form is characterised by a profuse purpuric rash with rapid onset of coma and by death within 24 hours Pathologically there is intense congestion and œdema, small hæmorrhages and capillary thrombosis widespread in the central nervous axis, but little evidence of polymorph infiltration The process is apparently too rapid for much multiplication of organisms within the body, and is more consistent with a toxic effect produced by massive doses of highly virulent organisms. Varying degrees of the acuteness of the process can be recognised In the most rapid cases there is no time for meningitis to develop before death In others there is commencing meningitis, and occasionally there may also be invasion of the suprarenals accompanied by massive hæmorrhage (In addition to the fulminating encephalitic cases there is a quite different fulminating form of the infection which picks out the suprarenals only, leaving the brain and cord intact except sometimes for meningitis The outstanding clinical sign here is hypotension, and cerebral signs are relatively slight or absent Mixtures of these two fulminating types also occur.)

The second main cerebral syndrome, slightly less intense than the fulminating, is an acute encephalomeningitis Clinically it is characterised by signs of acute meningitis which rapidly become complicated by encephalitic signs, especially sustained deep coma, cyanosis, and rapid or stertorous and irregular breathing These cases usually end fatally within a few days without regaining consciousness, but recovery with transient parkinsonian symptoms is demonstrated in this paper Pathologically the lesion in the central nervous axis is dual There is, first, congestion and œdema with capillary thrombosis and hæmorrhages scattered regionally, probably a toxic effect Secondly there is an inflammatory reaction, shown by perivascular polymorph cuffing and hæmorrhage, sometimes with fibrin deposition and even commencing abscess formation Under sulphonamide treatment both the meningitis and the cerebral inflammatory reaction usually show signs of clearing up, but the toxic damage is relatively unaffected and is probably the principal factor in the fatal result

The third main syndrome shows cerebral invasion to a much smaller extent, and may be seen not only at the most virulent phase of an epidemic but at other stages also It may be described as meningitis with focal encephalomyelitis The clinical picture in this type is diverse, including protracted and recurrent delirium with sudden fatal collapse, or sudden convulsions with secondary coma and death, or even deep coma resulting from large subdural hæmorrhage Pathologically, the lesion consists of purulent meningitis, with a limited number of small hæmorrhages and sometimes thromboses and slight perivascular infiltration, usually about the basal ganglia, midbrain, medulla or upper cord

Summary

Meningococcal infection of the central nervous system is not limited to meningitis, careful histological examination of the brain and cord occasionally provides evidence of widespread (regional) or focal encephalomyelitis

In epidemics a rare form of fulminating meningococcal encephalitis with a characteristic clinical picture and pathological pattern may occur This is quite different from the fulminating cases associated with an adrenal lesion, although mixtures of the two forms are occasionally seen

Another distinctive clinico-pathological cerebral syndrome, also seen chiefly in epidemics, is acute encephalomeningitis It is usually fatal in a few days, but recovery with transient parkinsonism is known

A third and more limited type of meningococcal invasion of the central nervous axis is described as meningitis with focal encephalomyelitis It may sometimes be associated with unexpected fatal collapse or convulsions

We report 10 cases 3 of fulminating encephalitis, 4 of acute encephalomeningitis and 3 of meningitis with focal encephalomyelitis

We have to thank Dr A B Bratton and his staff of the Central Histological Laboratory for performing autopsies and preparing sections, Dr E M Young of the Southern Group Laboratory for other post mortem work, Dr L J M Laurent and Dr E Montuschi for help in the clinical work, Messrs Ciba Ltd for providing regular supplies of sulphathiazole (‘Cibazol’), and Messrs May and Baker Ltd for supplying Thiazamide The microphotographs were produced at the Southern Group Laboratory, Park Hospital This work is published with the permission of the Medical Officer of Health, London County Council, but we are solely responsible for the views expressed

REFERENCES

Banks, H S (1940) *Proc R Soc Med* 33 555
Boyd W (1940) Pathology of Internal Diseases London, p 726
Councilman W T, Mallory, F B and Wright, J H (1898) *Rep S Mass Bd Hlth*
Flexner, S and Barker L F (1894) *Amer J med Sci* 107, 155, 259
Foster, M and Gaskell, J F (1916) Cerebrospinal Fever, London p 98
Hagelstam, J (1893) *Zbl allg Path path Anat* 4, 686
Jonesco Sisesti, M M and Stroesco, G (1939) *Bull Acad Med Paris* 121 792
Klebs, E (1877) *Arch exper Path Pharmak*
Netter, A and Debré, R (1911) La Méningite Cérébro Spinale, Paris, p 222
Strumpell, A (1889) Spec Pathol und Therapie, Leipsig, vol I, p 159
Worster-Drought C and Kennedy, A M (1919) Cerebrospinal Fever, London, p 361

INTESTINAL FLATULENCE WITHOUT EXCESSIVE FERMENTATION

SIR ARTHUR HURST, D M OXFD, F R C P
CONSULTING PHYSICIAN TO GUY'S HOSPITAL, TEMPORARY PHYSICIAN TO THE RADCLIFFE INFIRMARY, OXFORD

(*Illustrations on plate*)

INTESTINAL carbohydrate dyspepsia, about which Knott and I published a paper in 1931, accounts for approximately half the cases in which excessive gas accumulates in the intestine and excess of flatus is passed, it can be relieved by restricting carbohydrate intake In the remaining cases gaseous distension of the intestines occurs without any excessive fermentation as a result of interference with the normal absorption of gas by the veins of the bowel This is the cause of the intestinal flatulence of portal obstruction and of chronic cardiac and pulmonary disorders It is often the first symptom of cirrhosis of the liver, “*le vent avant la pluie*,” and of heart failure It may also be caused by local venous obstruction in chronic partial volvulus of the cæcum or pelvic colon, a not uncommon condition, which only occasionally ends in acute volvulus with extreme gaseous distension due to complete venous obstruction The distension of the bowels in this second group of conditions is quite unaffected by restricting the starch of the diet It is made worse by aperients and is either incompletely relieved or actually aggravated by enemas In most cases the patient gains immediate relief by passing flatus, the condition causing little discomfort but much inconvenience owing to the frequency with which flatus has to be passed during both day and night In some cases, however, relief is only partial, and considerable discomfort ensues from the abnormal tension on the walls of the intestine caused by the presence of excess of gas The distended colon may press upon and dislocate the stomach, producing either obstruction at the cardia with consequent *aerogastrie bloque* (Ramond 1920, 1933, Hurst 1938), in which gas is locked in the stomach and cannot be evacuated by belching, or pyloric obstruction

The well-known effect of the pressor substance of the posterior lobe of the pituitary in postoperative ileus, and in the preparation of patients for cholecystography (first proposed by Collins and Root 1936), suggests that it might be useful for the intestinal flatulence in these conditions Most patients with diabetes insipidus are familiar with the fact that the pressor substance causes immediate and complete defæcation, and colic associated with overaction of the bowels may be a serious drawback in their treatment With intestinal flatulence I have found that on using ‘Pitressin’ (PDCo)[*] both fæces and gas are evacuated by a single mass peristaltic contraction of the colon without the slightest discomfort, provided that care is taken to adjust the dose to the minimal requisite units (20 units = 1 c cm) The fæces differ from those evacuated by a purgative in consisting of the normal colonic contents without the excess of water and incompletely digested food produced by over-rapid passage through the small intestine, and without the mucus produced by irritation of the intestinal mucous membrane The daily use of pitressin does not appear to lead to any ill effects, and it is sometimes possible to reduce the dose gradually till no more is required When pressure by the greatly distended colon has resulted in *aerogastric bloque* or pyloric obstruction, these secondary effects are also overcome by the use of pitressin, as in the following case

---

[*] A solution of pressor substance of the posterior lobe of the pituitary without the principle that acts on the uterus

CASE-RECORD

A woman of 54 was admitted to the Acland Home on Jan 29, 1941, for indigestion of 10 years' duration She experienced a sensation of fullness in the epigastrium after meals which sometimes amounted to pain It often caused vomiting, which gave immediate relief She found it necessary to restrict her intake of food and she consequently steadily lost weight The symptoms were always aggravated by worry In October, 1939, she had had violent pain and vomiting, and acute intestinal obstruction was diagnosed The cæcum was found to be enormously distended and a cæcostomy was performed, but two months later abdominal exploration, on closing the stoma, revealed no cause of obstruction except an acute kink just beyond the hepatic flexure The patient was better for a time, but in September, 1940, there was recurrence of epigastric pain and vomiting with rapid loss of weight By eating very little she could keep comparatively comfortable, but a normal intake of food at once led to severe discomfort, disturbed nights and vomiting Between September, 1940, and her admission in January, 1941, she lost a stone and a half in weight She was much troubled with constipation, for which she habitually took aperients, and passed a great deal of flatus which gave little relief When X rayed in January, 1941, just before admission, severe gastric stasis was discovered, a considerable residue being still present at 24 hours This was thought to be caused by a stricture of the duodenum from old ulceration Since there was no history suggesting duodenal ulceration, and since both the original radiograms and others taken in Oxford by Dr D T Barnes showed an enormous accumulation of gas in the cæcum and ascending colon (fig I), I thought it possible that the duodenal obstruction was caused by external pressure by the dilated intestine, and not by cicatricial stenosis (fig II) Her bowels were opened with aperients and enemas, but they both increased the discomfort and did not reduce the gaseous distension Examination of the stools showed no deficiency in the digestion of starch and no gas was produced on incubation

It was then decided to try the effect of subcutaneous injections of pitressin The patient's bowels were opened within 5 min of the first injection of 20 units (1 c cm), and a large quantity of wind was evacuated without the slightest discomfort The gastric stasis and associated feeling of epigastric discomfort disappeared The X rays showed that the injection must have been followed by mass peristalsis which almost completely evacuated the fæces and gas from the colon (fig III) The patient continued to inject 18 units (0 9 c cm) of pitressin every morning without any aperients, and with this treatment her bowels were regularly opened, and the gastric discomfort and cæcal distension completely disappeared She reported at the end of December that she was now taking 8 units (0 4 c cm) of pitressin every morning and was comfortable in every way She was on a full diet and lived an active life

I am inclined to think that she must originally have had a partial volvulus of the cæcum and ascending colon, and that the circulation of this part of the colon was permanently impaired, so that the gas normally produced by bacterial activity in the proximal part of the colon could not be absorbed

SUMMARY

Excess of gas may accumulate in the colon as a result of either excessive production by fermentation or of deficient absorption The former alone is relieved by restriction of starch

Colonic distension may dislocate the stomach, producing obstruction of the cardia (*aerogastric bloque*) or pylorus

Complete and painless evacuation of fæces and gas can be obtained by subcutaneous injection of pitressin

REFERENCES

Collins, E N and Root, J C (1936) *J Amer med Ass* 107, 32
Hurst, A F (1938) *Brit med J* i, 661
— and Knott, F A (1931) *Quart J Med* 24, 271
Ramond, F (1920) Les maladies de l'estomac et du duodénum, Paris , (1933) L'aérophagie, Paris

---

HISTOPLASMOSIS OF DARLING

REPORT OF A CASE

D C L Derry,
M B LOND,
PATHOLOGIST, E M S

W I Card,
M D LOND , M R C P
OUTPATIENT PHYSICIAN, ST THOMAS'S HOSPITAL, PHYSICIAN, E M S

Richard Wilson, M B CAMB , M R C P
MEDICAL REGISTRAR, ST THOMAS'S HOSPITAL

(*Illustrations on plate*)

In 1905 S T Darling was one of the pathologists in the Panama Canal Zone He had been interested in the discovery of the organism of kala-azar made two years before by Leishman and Donovan, and he set about examining microscopically the spleens of all those dying with a splenomegaly, in an attempt to identify this organism He failed to find cases of visceral leishmaniasis, but noted 3 cases containing similar bodies which he regarded as examples of a generalised protozoan infection This organism he named the *Histoplasma capsulatum* (Darling 1906) In 1913 Rocha-Lima pointed out the similarities between *Cryptococcus farciminosus*—the fungus responsible for epizootic lymphangitis—and *H capsulatum* and considered that the latter organism showed more affinities for the blastomyces than for the protozoa

A few cases of histoplasmosis were reported from time to time, but it was not until 1934 that De Monbreun first cultivated the parasite and determined its cultural characteristics This stimulated a search for other cases and in the latest review on the subject Meleney (1940) noted 19 cases and described 13 more then unpublished Not all of these were examples of proved infection by the fungus Our case of histoplasmosis is apparently the first to be noted in this country , indeed, no case seems yet to have been recorded outside the American continent

CASE-RECORD

A soldier, aged 30, was admitted to an E M S hospital on April 8, 1940, from a base hospital in France, complaining of cough and sore throat which he had had for three months He served as a regular soldier from 1932 to 1936 in India, and in the Sudan from 1936 to 1937 He had a slight attack of malaria in India but no dysentery, and could not recollect ever having any special contact with horses, mules or dogs He had no regular employment after his discharge from the Army, but worked as a general labourer, part of the time in a stone quarry, before returning to the Army in August, 1939 He had had no serious illnesses, and except for some winter cough had remained fit until December, 1939

LEGENDS TO ILLUSTRATIONS

DR BANKS AND DR MCCARTNEY

FIG I—Fulminating encephalitis Case 1 (A) Capillary thrombosis (× 250) (B) Capillary hæmorrhage (× 300)

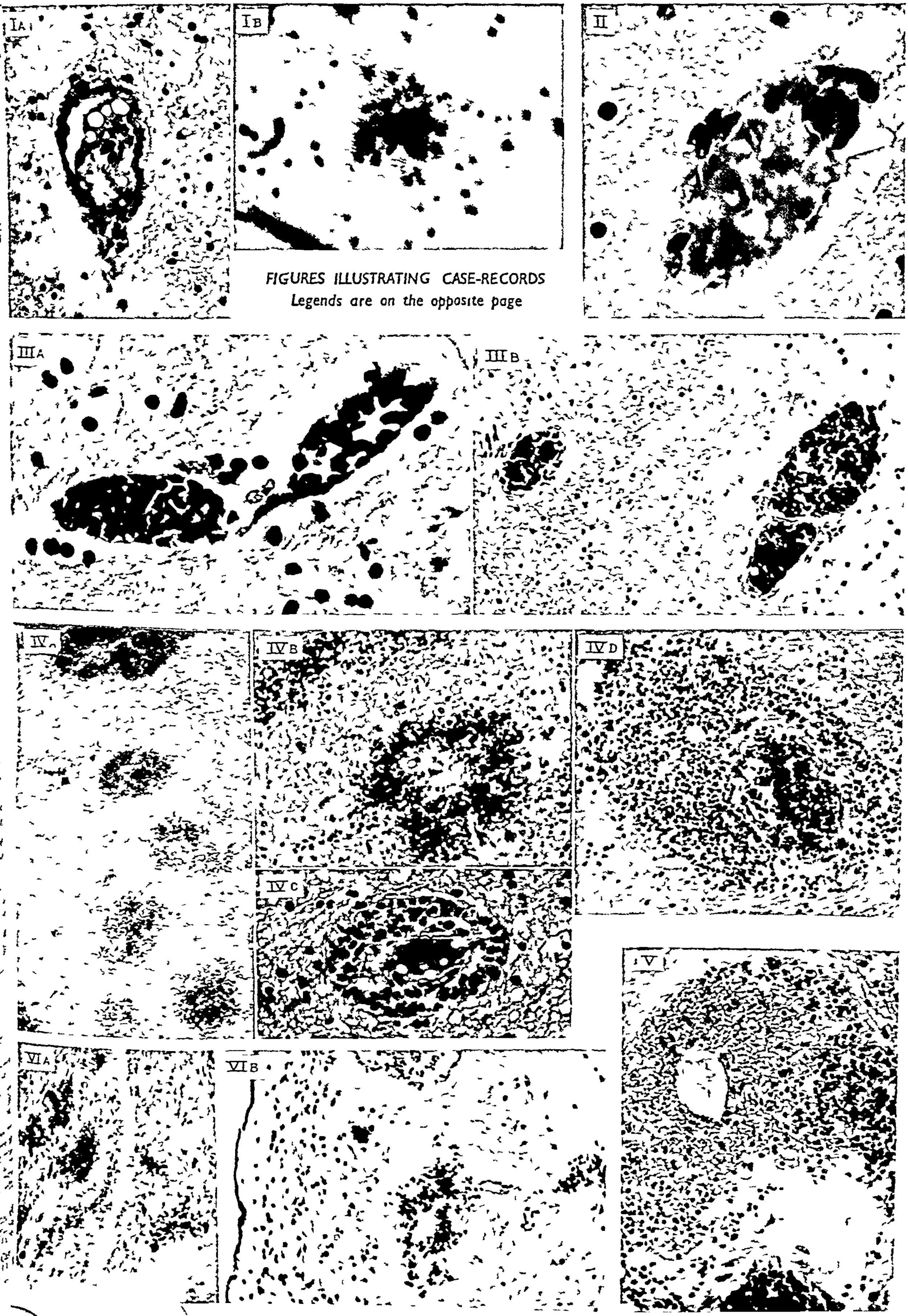
FIG II—Fulminating encephalitis and adrenal hæmorrhage Case 3 Capillary thrombosis with gross œdema (× 590)

FIG III—Acute widespread encephalomeningitis, rapid type Case 4 (A) Perivascular mononuclear infiltration (× 580) (B) Capillary thrombosis including one at a junction (× 190)

FIG IV—Acute widespread encephalomeningitis, slower type Case 5 (A) Multiple capillary hæmorrhages polymorph perivascular cuffing at the top (× 35) (B) Capillary hæmorrhages with thrombosed capillary in centre (× 140) (C) Capillary thrombosis with perivascular cuffing (× 295) (D) Congestion, capillary thrombosis, polymorph and mononuclear cuffing (× 250)

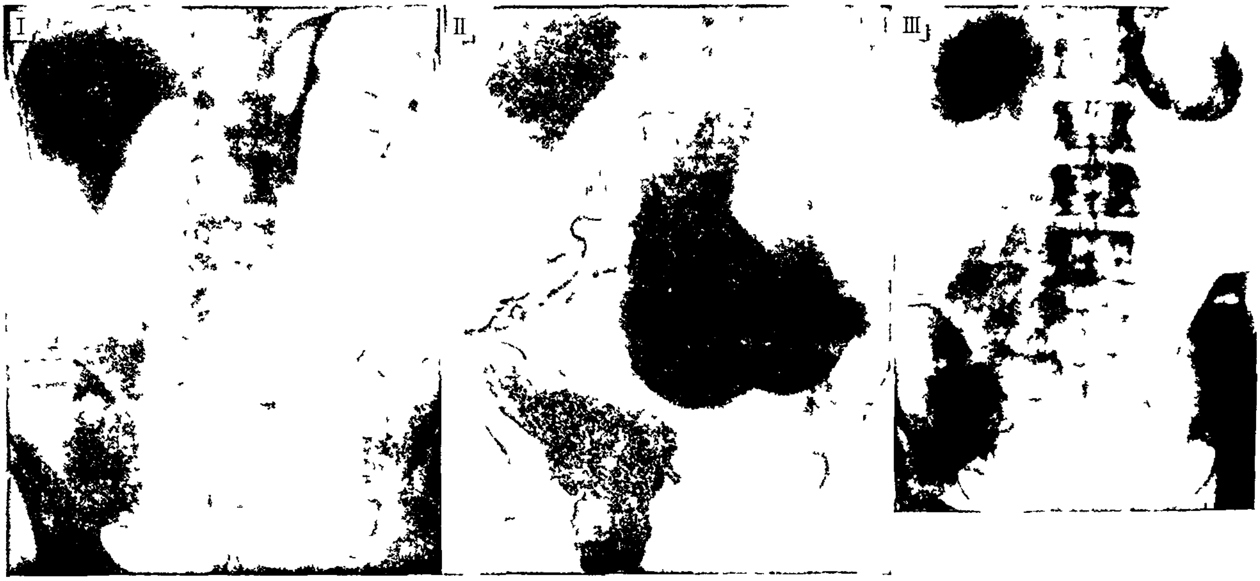
FIG V—Acute widespread encephalomeningitis not treated with sulphonamides Case 7 Congestion, capillary thrombosis fibrinous and polymorph cuffing , commencing abscess (× 190)

FIG VI—Meningitis with focal encephalomyelitis (A) Case 8 Capillary hæmorrhages in upper cervical cord (× 80) (B) Case 9 Capillary hæmorrhages under ependyma (× 115)

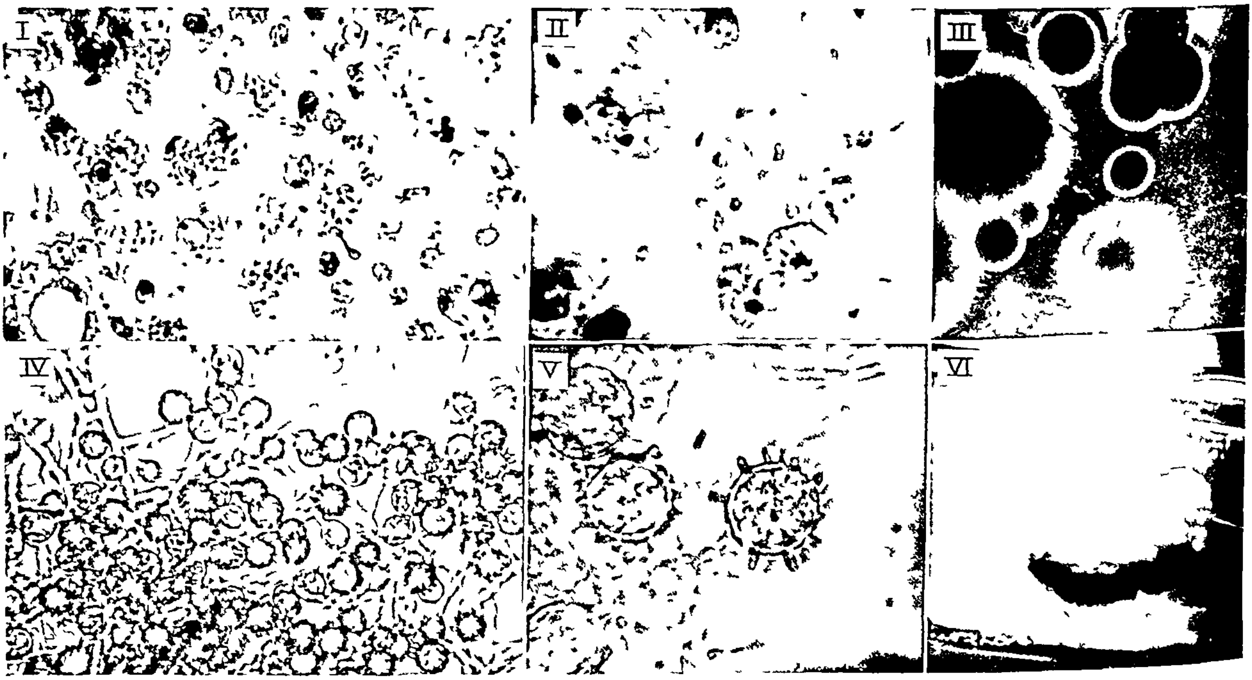


FIGURES ILLUSTRATING CASE-RECORDS
Legends are on the opposite page

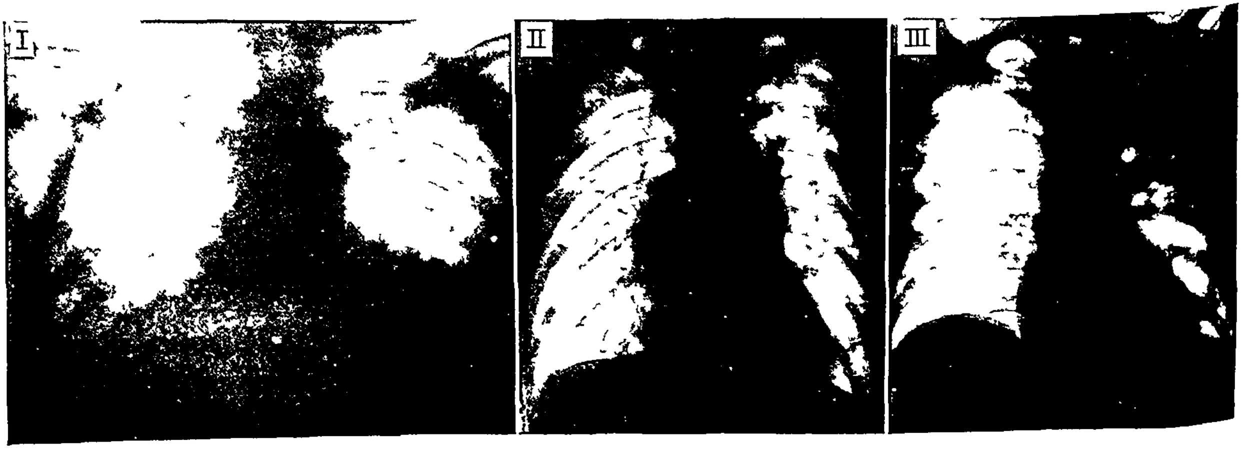
SIR ARTHUR HURST INTESTINAL FLATULENCE



DRS DERRY, CARD, WILSON, DUNCAN HISTOPLASMOSIS OF DARLING



MR SCOTT, DR KEMP, DR ROBB-SMITH. PULMONARY FAT-EMBOLISM



Legends are on the opposite page

During that month, while in France, he developed a severe cough and 2 months later a swelling in the preauricular region The swelling was painless and disappeared after 5 days of conservative treatment, the cough also disappeared and feeling fit he came home on leave on Jan 12, 1940 After 3 days he developed a cough and left-sided pleurisy, and was kept in bed for 2 weeks He then returned to France though the cough had not gone During the next few weeks he reported sick periodically with shortness of breath on exertion On March 18, 5 weeks after his return to France, he developed another swelling, this time under his chin, and was admitted to a base hospital with a tentative diagnosis of pulmonary tuberculosis He had a remittent temperature and a submental abscess which was incised, streptococci being grown from the pus, 9 days later a direct smear from the submental abscess showed many pus cells, no tubercle bacilli were seen and culture was sterile The spleen was palpable A blood-count was normal, his temperature rose to 100°–101° F and his pulse-rate was 80–100 While in the base hospital his general condition deteriorated, and he was therefore sent home to England

When admitted to the E M S hospital he was pale and wasted No enlarged lymph-nodes were felt There were no abnormal physical signs in his chest Clinically his heart was normal, blood-pressure 140/75 mm Hg His spleen and liver were not definitely palpable He had an irregular pyrexia with a corresponding tachycardia Sputum was exhaustively examined for tubercle bacilli with negative results Blood-count on April 15 red cells 4 400,000, Hb 62%, colour-index 0 7, white cells 13,000 (polymorphs 78%, lymphocytes 13%, large hyalines 9%) Routine serum agglutinations were negative An X ray of his abdomen showed some enlargement of his liver and left kidney All other clinical, laboratory and radiological investigations were negative He was treated with iron and nursed in the open air, no diagnosis having been made A course of sulphapyridine was started on May 9 and for 3 days his temperature remained normal, it then rose to 101° F and the drug was discontinued 3 days later By this time his spleen and liver were palpable and remained so Clinically he appeared to be much improved and except for a slight cough and some sweating was free from symptoms Blood-count on May 6 red cells 4,360,000, Hb 85%, colour-index 0 9, white cells 6600 (polymorphs 81%, lymphocytes 15%, large hyalines 3%, eosinophils 1%) Blood-culture on May 15 negative after 10 days, no parasites seen in blood films, blood Wassermann and Kahn reactions negative Microscopical examination of his urine showed only occasional red cells and an intravenous pyelogram was within normal limits On the chance that this was an atypical case of malaria, a course of quinine, gr 10 t d s, was given for 5 days without effect The possibility of kala-azar had been entertained for some time, and on June 6 a sternal puncture was done. Examination of the marrow showed a differential count within normal limits and no intracellular organisms The formol-gel test of Napier was negative on 3 occasions

At about this time the patient complained of pain in the left upper abdomen and was drowsy His condition, which up to now had remained stationary, began to deteriorate Diagnoses considered were lymphadenoma, lymphosarcoma and aleukæmic leukæmia His liver and spleen were still enlarged and tender, but no connexion between this enlargement and the original swelling of the preauricular and submandibular glands had been established On admission no swelling was visible in these regions, but 3 weeks later, on April 29, a tender mobile preauricular swelling developed beneath the scar of the old incision This subsided, but was again noted on June 4 and a few days later broke down and discharged The discharge was sterile on culture and no tubercle bacilli were seen, but unfortunately no cytological examination was made On July 14 a biopsy was done on a granulomatous mass which had formed on the site of the old incision in the submental region Microscopy showed numerous endothelial cells with inclusion bodies which were recognised as yeasts, and on Aug 3 a glandular swelling appeared in the upper part of the left femoral triangle A biopsy was performed on this swelling, which on incision had the appearance of a cold abscess with some greenish pus and a necrotic centre The tissue removed had microscopical appearances similar to that obtained from the submental region This finding established the presence of a systemic mycosis The stools were examined for yeasts but none was seen

On the supposition that the case might be kala-azar, a course of intravenous antimony had been started on July 6 Injections of ‘Neostam’ (BWCo) were given on alternate days, a total of 1 15 g being given The drug was stopped owing to the discovery of the fungus, and large doses of potassium iodide, up to gr 240 daily, were given The patient had developed œdema around the ankles and over the sacrum on June 24, and a month later ascites and meteorism appeared These caused considerable abdominal distension and much distress until his death On July 30 a specimen of urine showed a few hyaline and granular casts Liver function on Aug 7 was 92% of normal as estimated by the hippuric acid excretion test An X ray of chest on July 27 showed slight basal congestion with a high right diaphragm By that time the patient had become very emaciated, the sinuses on the face, chin and thigh had failed to heal and exuded serous fluid A last blood-count showed white cells 18,000 (polymorphs 84%, lymphocytes, 12%, large hyalines 4%), no evidence of monocytic phagocytosis The patient died on Aug 23

AUTOPSY

The body was that of an emaciated man with right submental and preauricular sinuses and a distended abdomen Tonsils and post lingual lymphoid tissue hyperplastic, showing areas of necrosis on section; anterior and posterior cervical glands on both sides firm and whitish and greatly enlarged, several showed central necrosis Bronchial and mediastinal glands not enlarged Mesenteric nodes enlarged and whitish Old adhesions of right lung all lobes showed gross œdema and Tardieu s spots Terminal bronchopneumonia Heart small, increased pericardial fluid with gelatinous œdema of pericardial fat Cultures taken from heart's blood Much ascites Liver adherent to diaphragm, stomach, spleen and both kidney areas Large retroperitoneal mass behind liver, involving lesser sac, and extending from pole of one kidney to pole of other Adrenals could not be identified, main portion of the mass was over left adrenal area On cutting into mass a large quantity of pultaceous material escaped, cavity had rough shaggy lining Cultures were taken Small intestine showed several intramural subperitoneal foci, similar in appearance to main mass Two large old calcified tuberculous glands present in cæcal region Spleen weighed 17 oz Capsule thickened, on section several whitish areas present, some immediately under capsule, one had ruptured, releasing necrotic material into peritoneal cavity Pelvis full of purulent lymph Primary site of suppuration appeared to be in retroperitoneal lymphatic tissues of upper abdominal wall, which had broken down in one place, discharging pus

LEGENDS TO ILLUSTRATIONS

SIR ARTHUR HURST

FIG I—Large accumulation of gas in colon

FIG II—Radiogram taken 7 hours after opaque meal showing gastric stasis caused by dislocation of stomach by distended colon

FIG III—Disappearance of gas from colon 5 min after injection of 0 5 c cm pitressin

DRS DERRY, CARD, WILSON, DUNCAN

FIG I—Tissue from lymph gland in groin showing large endothelial cells filled with yeast bodies (×120)

FIG II—Large endothelial cell with three nuclei and filled with yeast bodies (×1200)

FIG III—Fourteen-day culture of the mycelial or saprophytic form, showing aerial hyphæ

FIG IV—Chlamydospores and hyphæ (×500)

FIG V—Chlamydospores echinate form (×1200)

FIG VI—Pathogenic or yeast form after three weeks growth at 37° C on blood agar

MR SCOTT, DR KEMP, DR ROBB SMITH

FIG I—Radiogram of case 1 taken 5 days after the onset of symptoms, showing the signs of pulmonary œdema

FIG II—Radiogram of case 3 the day after the accident showing signs of previous pulmonary disease but no evidence of pulmonary consolidation

FIG III—Radiogram of case 4 a few hours after the accident, showing patchy consolidation of the left lung and a clear right lung field

into pelvis , apart from this spread was confined to reticulo-endothelial system Bone marrow of shaft of femur red , films showed no yeasts

Sections (stained hæmatoxylin and eosin, other stains gave no additional information) —Spleen localised necrotic areas consisting of a surround of large endothelial cells, with many spores in their cytoplasm, merging into a necrotic centre where cells of tissue showed as " ghost " forms No yeasts present in necrotic areas Between these areas was a band of pyknotic cells and cell debris Remaining splenic tissue congested and fibrotic with scattered eosinophil and plasma cells, little normal pulp remained No purulent areas Bone-marrow some normocytic myeloid hyperplasia , no yeasts present Liver acute passive venous congestion, with foci of small round cells in Glisson's capsule , no yeasts present, where liver tissue was in contact with abscess mass there was erosion of capsule by granulation tissue of the type already described Kidneys patchy interstitial fibrosis, with œdema and cloudy swelling and areas of small round-cell infiltration , early fibrosis of glomeruli , thickened capsule , no yeasts in parenchyma , capsule eroded where in contact with main abscess mass Lungs usual picture of bronchopneumonia , no yeasts present Tonsils, cervical *lymph-glands and subperitoneal foci in the small bowel all* showed typical yeast-bearing granulations with necrotic centres Large bowel and pelvic colon showed several similar foci of granulation tissue

PATHOLOGY

Culture of pus from the submental sinus on June 12 showed a few colonies of *Staphylococcus albus* and *aureus* On July 14, section of tissue from the wall of the submental sinus allowed a provisional diagnosis of mycotic infection to be made The granulation tissue showed considerable endothelial cell hyperplasia, with areas in which the endothelial cells formed giant cells, having two and sometimes three nuclei and cytoplasm packed with small yeastlike bodies about 1 5–2μ in diameter Some of these bodies appeared to have capsules and measured 2–3μ in diameter , these stained well with ordinary hæmatoxylin and eosin Several areas showed *necrosis , no purulent reaction was present* Leishman-Donovan bodies were excluded by the lack of the typical nucleus and rod shaped kinetoplast (figs I and II)

On July 14 another specimen of pus from the same sinus was found to contain masses of typical oatshaped yeast bodies, about 10–12μ in diameter In stained films these showed thick capsules containing peripheral crescentic nuclei , at the time it was thought they might be a secondary infection of the sinus On ordinary media colonies of *Staph aureus* and *albus* were grown

On Aug 5 an enlarged lymph node removed from Scarpa's triangle was found, both in smears and on section, to be histologically identical with the former specimen from the submental region , the large endothelial cells loaded with yeasts were again the most arresting part of the picture It was then realised that we must be dealing with a form of systemic yeast infection, since there had been no breaking down of the skin over the site of the gland In view of this, on Aug 13 another swab from the original sinus was plated on Allison Ayling tellurite medium, and incubated at room temperature and at 37° C , both anaerobically and aerobically Those plates incubated anaerobically showed no growth , those incubated aerobically at 37° C grew a diphtheroid bacillus, but those grown at room temperature showed on the fourth day thin dry greyish gossamer-like colonies consisting of a fine branching mycelium , by placing the plate under the low power this mycelium was seen to emanate from the individual yeast bodies

On Aug 15 the patient's blood was examined for yeasts, but no monocytic phagocytosis—as described by Dodd and Tomkins (1934) in their case of histoplasmosis—was demonstrable Blood culture was not tried On the same date a second attempt was made to isolate the yeast from the sinus discharge, the material being sown on human blood agar, beerwort agar, Sabouraud's medium, 10% dextrose agar, and malachite green medium , all these cultures were heavily overgrown with diphtheroids

On Aug 20 subcultures were made from the original tellurite agar plate on to Sabouraud's medium, rabbit's blood agar, beerwort agar, and a second tellurite plate All were put up at 37° C and at room temperature aerobically At 37° C nothing grew , but at room temperature a good growth of the fungus was obtained on all media

On Aug 23 the patient died, and an autopsy was performed an hour after death with the object of getting live cultures and the freshest material possible for sections Cultures from the heart's blood plated on rabbit's blood agar and incubated at room temperature and at 37° C grew only *Bacterium coli* Of the cultures from the main mass incubated at room temperature, *Bact coli*, *Staph albus* and a fungus similar in all respects to that grown during life were isolated The tellurite agar plate, inoculated with the same material, gave a pure culture of this fungus, which had similar morphology and cultural characteristics to the fungus obtained during life In none of these cultures was the original yeast form obtained The original cultures underwent various changes with age, the colonies gradually became ochre in colour with a dark brown centre, and about the 14th day aerial hyphæ became apparent to the naked eye as whitish tufts These bore chlamydospores on short stalks, and many showed terminal or intercalary chlamydospores The colony grew down into the agar almost as far as the aerial portion rose above it, and similar chlamydospores were formed in the submerged portion No yeast like bodies could be seen The culture smelt like rotten wood The chlamydospores, about 16–25μ in diameter, consisted of a capsule varying in thickness and containing many small round bodies which stained fat positive with Sharlach R The submerged chlamydospores appeared to *have a thicker capsule Many of the aerial chlamydospores* were studded with short thick protoplasmic processes varying in length from 1 to 6μ (echinate forms) The organism grew quite well on subculture on the ordinary laboratory media The young mycelium was straight branched and segmented with thin walls filled with granular cytoplasm and a few fat globules, the granules being in brownian movement As the culture aged the mycelium became greater in diameter, and the walls thicker The young mycelium was about 2–5μ in diameter When De Monbreun's method of drying the mycelium was used and the chlamydospores plated, they were never induced to sprout new mycelium , and although repeated efforts were made to induce a change to the yeast form by this method no success was obtained Later, a good growth of the yeast form was obtained several times by heavy inoculation on blood agar at 37° C (figs III–VI)

DISCUSSION

The symptoms and signs in the reported cases of histoplasmosis are variable Anæmia, wasting, long-continued fever and sweating are the only constant features , splenomegaly, enlargement of lymph-glands, and pulmonary symptoms are relatively common It is impossible to make a diagnosis from the clinical manifestations alone and histological and cultural methods must be employed Very few of the cases in the literature were diagnosed during life

Nothing in the history of our case suggested a probable source of the infection With the exception of this case and one of doubtful authenticity in Java, the small number of recorded instances of human histoplasmosis have occurred in widely separated places in Central and North America There is no known occupational factor and the age of the affected persons ranges from 6 months —in a case reported by Dodd and Tompkins (1934)—to adult life The duration of the disease to the time of death is usually months, but the infant described by Dodd and Tompkins died in less than 8 weeks

Treatment in all of the definitely proved cases recorded has been ineffective Meleney (1940) suggests that the localisation of the organism in the reticulo-endothelial system may be evidence of its susceptibility to antimony and that this should be given Neostam was tried in our case but the dose was not pushed to an effective level

The large increase in the number of cases reported recently from America suggests that this type of infection has been overlooked in the past It seems possible that cases of histoplasmosis have similarly escaped recognition in this country

Mycological Note

DR J T DUNCAN

EMERGENCY PUBLIC HEALTH LABORATORY SERVICE AND LONDON SCHOOL OF HYGIENE

On Aug 12, 1940, I received two paraffin sections of a lymphatic gland excised from the patient's neck These, when stained by Giemsa's stain and by the Claudius modification of Gram's method, showed the characteristic picture of histoplasmosis No fresh material was available to me for cultivation of the causal fungus, but shortly afterwards Dr Derry succeeded in cultivating it from materials taken both before and after death I received a transplant of this fungus and found it to agree in all essential morphological characters with *H capsulatum* Darling as described by De Monbreun (1934)

This fungus is a parasite of the reticulo-endothelial system, the cells of which are stimulated to local hyperplasia by the distribution of the parasite in the body, with associated non-inflammatory focal necroses in the organs and tissues infiltrated The resulting symptoms, depending on the organs chiefly affected, vary and the disease may simulate kala-azar, tuberculosis, and certain mycotic infections For this reason the diagnosis, as with other mycotic granulomata, must eventually depend on identification of the causal fungus, which should present little difficulty if the disease is suspected The fungus should be identified both in preparations from the lesions and in culture

In the lesion —For microscopic examination of the infected tissues, fragments should be obtained if possible by biopsy from an involved superficial lymphatic gland or skin lesion, or by sternal trephining, or, perhaps, by spleen or liver puncture when these organs are affected A thick blood-smear technique may also be tried, and the pus like material from breaking down granulomata and sputum from pulmonary cases should be examined Slide smears should be made and if fragments of tissue are available these should be embedded in paraffin and sectioned In smears and sections stained by Giemsa's or similar stains, or by hæmatoxylin and eosin, the parasitic form of the fungus is seen as an oval or apiculate yeast, present in large numbers within the endothelial cells or lying free Its average measurements, depending on the method of preparation, are about 3 5μ by 2 5–3μ and it possesses a thick, well defined, achromatic capsular structure , its cytoplasm presents the characteristic vacuoles of the yeasts and its nucleus is ill-defined or not stained In contrast with this, the Leishman-Donovan body, the parasite of kala azar for which *H capsulatum* may be mistaken, presents a strongly staining nucleus and blepharoplast and is, of course, a protozoon Confirmatory evidence of the nature of the parasite may be got by staining the preparation by the Claudius modification of Gram's method which colours *H capsulatum* solidly a deep violet against the yellow background of the containing cell The appearance of large numbers of these small capsulated yeasts filling the cells of the reticulo-endothelial granuloma is characteristic of histoplasmosis

In culture —Although the diagnosis of histoplasmosis can be made by microscopic examination of the tissues alone, the specific identification of the causal fungus requires its study in artificial culture The fungus grows freely and survives for long periods on a variety of common culture media, yet the history of histoplasmosis records repeated failure to cultivate the causative fungus until De Monbreun succeeded in 1932 Failure in attempts at primary culture may be due to concomitant or contaminating bacteria which, growing rapidly, prevent the development of the fungus, to the use of unsuitable inocula in which the fungus elements are no longer viable, to insufficiently heavy sowing, to failing to incubate some of the cultures at a temperature below body heat, or to not allowing time for the slow initial growth

The material for cultivation—ground up tissue or pus-like material—must be sown thickly on the medium, not only to introduce a sufficient number of viable fungus elements but to provide some of the animal tissue in which the fungus has been living, for it seems probable that adaptation of the parasitic fungus to saprophytic life is aided by the presence of such material, and that the earliest saprophytic growth develops on it and extends to the artificial culture medium later A medium capable of inhibiting the growth of the common bacterial contaminants should be used for primary culture, and for this purpose the trypsinised serum tellurite copper sulphate agar of Allison and Ayling (1929) will be found particularly suitable It has proved valuable in the primary cultivation of other fungi, especially ringworm fungi, and its initial reaction of pH 8 does not affect its usefulness in this work Most of the cultures should be incubated at 24° C , or at room temperature, which favours the development of the more rapidly growing and more luxuriant cultures of the mycelial form of the fungus, but some should be incubated at 37° C The initial colonies may be expected to appear between the 5th and 20th days or later

There are two different forms of the fungus in saprophytic life—a mycelial form and a yeast like form The mycelial form develops very freely at room temperature, as well as at 37° C , on nearly all culture media, and bears the characteristic reproductive bodies (tuberculated chlamydospores) by which the species may readily be identified The yeast form, which *is morphologically similar to the parasitic stage seen in the* lesions, but without the capsule, develops only at about 37° C and only on particular media, such as blood-agar or coagulated serum On these it may be obtained in primary culture from the morbid tissues It may also be developed from the mycelial form by making a heavy sowing of the chlamydospores on blood-agar and incubating at 37° C , taking precautions to prevent drying Under these conditions, the germ tubes arising from the chlamydospores do not develop a mycelium but bear bud cells, and these in turn bud off similar cells which, separating, continue to vegetate by budding, producing chains and groups of yeasts Once established in culture the yeast form can be propagated indefinitely, unchanged, on the two media mentioned and on glucose agar if the cultures are maintained at 37° C and protected from drying Active yeast form cultures transferred to other media, or kept on any medium at room temperature, will slowly revert to the mycelial form

Cultures of the strain of *H capsulatum* from the case described here were found to be still viable after the following periods the yeast form, up to 9 months on glucose-agar, capped and kept at 37° C ; the mycelial form, at room temperature, after 9 months in 10% sucrose solution, and with slow desiccation after 7 months on glucose-agar These periods are longer than those recorded for survival of some of the American strains on other media

The free-growing character and the resistance to drying of the mycelial form of the fungus suggest the possibility of a saprophytic life in wild nature, which might have a bearing on the epidemiology of the disease , but there is, as yet, no evidence of any such existence of the fungus, and the source of infection is not known De Monbreun (1939) has described naturally acquired histoplasmosis in a pet dog, which may suggest the possibility of an animal source of the human infection In the analogous mycotic diseases, coccidioidal granuloma and sporotrichosis, natural infections of some of the lower animals occur but the disease in man is usually attributed to infection by saprophytic forms of the fungi known to vegetate in wild nature Evidence bearing on this problem might be furnished by animal experiments , De Monbreun (1934), by giving relatively large doses of a living culture of the yeast form of *H capsulatum* intravenously to monkeys, produced a generalised invasion of the endothelial cells and death, with a histological picture resembling histoplasmosis Apparently an attempt to cause infection with the mycelial form was not successful Owing to war conditions, inoculation of animals with the fungus isolated from this case could not be undertaken There is a promising field for workers to experiment with both forms of the fungus, using small inocula with the object of causing a progressive infection, and following as closely as possible the presumed natural routes of entry Repeated failure to infect with the mycelial form may be expected, but should not be a deterrent to further experiment with this form

We are grateful to Mr S A Morgan and Mr P W Purkiss for their technical assistance

REFERENCES

Allison V D and Ayling T H (1929) *J Path Bact* 33, 299
Darling S T (1906) *J Amer med Ass* 46 1283
De Monbreun, W A (1934) *Amer J trop Med* 14, 93 (1939) *Ibid* 19 565
Dodd, K and Tompkins E H (1934) *Ibid*, 14, 127
Meleney H E (1940) *Ibid* 20, 603
Rocha Lima H (1913) *Zbl Bakt* 67 233

ADVISERS ON CHILD CARE —The Minister of Health in consultation with the President of the Board of Education has appointed four regional advisers on child care for the parts of the country where the work of arranging for the care of the children of employed women is likely to be heavy Lady Reading will act as adviser for the midland region, Lady Openshaw for the north western region, Mrs Eva Hubback for the southern region and Mrs. T Todd for the northern region In London, Mr H U Willink, regional commissioner for the care of the homeless, has also undertaken the general supervision of this work

PULMONARY FAT-EMBOLISM

CLINICAL AND RADIOLOGICAL OBSERVATIONS

J C Scott,
M.S Toronto, F R C S.
Surgeon in charge of the Accident Service

F H Kemp,
M B Birm , M R C P , D M R
Assistant Radiologist

Note on Sputum Examination

A H T Robb-Smith, M D Lond
Director of Pathology, the Radcliffe Infirmary, Oxford

(*Illustrations on plate*)

It has lately been suggested that fat-embolism is commoner than has been suspected, and Robb Smith (1941) has reported a study of 115 fatal accidents in which fat-embolism was an almost constant finding, and in many cases was a major factor in the fatal outcome Bearing in mind these findings and those of others, notably Harris, Perritt and MacLachlin (1939) in Toronto, and Rowlands and Wakeley (1941), we present the records and radiographic findings of four patients who have survived fat-embolism

CASE 1

A man, aged 30, admitted to the Radcliffe Infirmary on Oct 17, 1940, under the care of Mr A Elliot Smith, with simple fractures of the right tibia and fibula There was some shortening of the limb, which was reduced with the Zimmer machine under general anæsthesia Later, the patient was transferred to the Acland Nursing Home On the 22nd he complained of sudden tightness in the chest and difficulty in breathing He had no cough or pain and his temperature was 103° F Next day, when he was seen by Dr F G Hobson, he had well marked dyspnœa at rest , respirations 40, pulse rate 130 per min and blood pressure 120/70 mm Hg He was extremely pale and his head and neck were covered with a profuse purpuric eruption Fine crepitations were heard throughout both lungs A blood examination was carried out by Dr D Black, who reported as follows (normal values in parentheses)

"Hæmoglobin 44% (Haldane), red cells 2,300,000, white cells 17,800 per cu mm Plasma volume 4 8 litres (3) Hæmatocrit 20 (44) Blood volume 6 litres (5) Blood urea 51 mg per 100 c cm Plasma protein 6% Plasma albumin 3 6% Plasma chloride 600 mg per 100 c cm Plasma bicarbonate 50 4 vol per 100 c cm The blood volume and count suggest that the anæmia is due to loss of red cells into the bruised tissue or skin petechiæ, and to an absolute increase of plasma volume, analogous to hydræmic plethora of pregnancy The increase in plasma volume has not been attended by any fall in plasma protein concentration, so protein must have been mobilised from the liver and from tissue stores Chloride is normal, and alkali reserve a low normal, while urea is moderately raised, as is not uncommon a few days after an accident "

The patient was given continuous oxygen by nasal catheter with considerable relief, and for two days his condition remained unchanged On the 25th there was some improvement Radiography of the chest (Dr D T Barnes) on the 27th (fig I) showed considerable consolidation and clouding of the lower halves of both lung fields From this time onwards the patient steadily improved Radiograms on Nov 4 showed that the consolidation had disappeared On Nov 15 the report on the blood was as follows

" Hæmoglobin 76% (Haldane), red cells 3,700,000 Plasma volume 4 litres Hæmatocrit 36% Blood volume 6 2 litres Blood urea 27 mg per 100 c cm Plasma protein 6% Plasma albumin 3 4% Plasma bicarbonate 56 vol per 100 c cm These results, in conjunction with those previously obtained, suggest that the main cause of the anæmia was blood loss into the traumatised area The total red cell volume increased by a litre in the interval between estimations The increase of 1 8 litre in the plasma volume above normal value at the first estimation could account for only a small part of the observed anæmia The blood chemistry is now normal "

Clinically this is a case of pulmonary and systemic fat-embolism, for the findings are characteristic—that is, after an interval of six days there was sudden respiratory distress associated with purpuric hæmorrhages over the neck and upper parts of the trunk The physical signs were those of acute pulmonary œdema and the radiographic appearances were typical of this condition There was no laboratory information to confirm the presence of fat

CASE 2

A man, aged 32, admitted to the Radcliffe Infirmary at 8 30 A M on Feb 5, 1941, 1½ hours after being hit by a car Suffering from moderate shock, severe compound fractures of the right tibia and fibula, and minor cuts and abrasions of his face and hands Temperature 97 8° F , respirations 20, pulse rate 80 per min , blood pressure 90/50 mm Hg, hæmoglobin 80% He was put in a warm room and given continuous oxygen at 5 litres per min with a BLB mask Later he was transfused with 1 pint of plasma At 11 A M he complained of abdominal pain, and was tender on both sides above the umbilicus, but there was no visible abnormality or sign of fractured ribs At 4 P M his respirations were raised and about this time he was radiographed The films showed fractures of the tibia and fibula with some overlap and angulation , the lung fields were clear and no fracture of the ribs was seen When he was seen by one of us at 7 30 P M his general condition was good (pulse rate 84, BP 120/80) His respiration was rapid (30) and he was slightly cyanosed Since there had been no injury to the chest and the radiogram showed no abnormality, fat embolism was suspected Operation was carried out at 8 30 P M under gas, oxygen and cyclopropane The fracture was at the junction of the upper and middle thirds of the tibia and about 4 in of bone was protruding through the wound The wound was incised and excised in the usual manner, and reduction was carried out on a Zimmer machine Plaster was applied with two pins in place

For some days after the operation the patient complained of pain in the right lower chest and abdominal discomfort His temperature rose to 100° F in the evening, pulse and respiration rates were raised and he produced a little blood stained sputum On Feb 6, the day after the injury, biochemical analysis of the sputum and urine showed considerable quantities of fat Subsequent examinations showed fat still present but in much reduced quantities On Feb 11, the patient was much better and from then onwards rapidly improved He never had any purpura or signs of a lesion in the central nervous system In March he had brief attacks of pain in the upper abdomen and the lower chest on the right side, but no abnormal physical signs were detected He was discharged well and walking with crutches on March 21

Clinically, this patient showed slight cyanosis and a raised respiratory rate after the signs of shock had passed, and it is thought that these signs were due to pulmonary fat-embolism because he had no injury to the chest and the radiogram showed no abnormality Fat was found in the sputum and urine next day, and in diminishing quantities at subsequent examinations Unfortunately the sputum was not sent for microscopical examination, which would have been a more reliable test

CASE 3

A woman, aged 39, admitted to the Radcliffe Infirmary on Aug 22, 1941, with a fracture of the neck of the left femur sustained by a fall while shopping There were signs of a fracture of the femoral neck but no contusion of the soft parts She had no other injuries She was very thin with a pale complexion and cyanosed lips Her voice was husky and she coughed frequently She had had a slight cough with a little sputum for three or four years, and frequent colds, and had had a bad cold for a fortnight before admission Her temperature, pulse and respiration rates were normal The chest showed signs of emphysema but no moist sounds or evidence of consolidation Next day her temperature was 101° F She had no pain but the cough was rather worse The chest still showed no moist sounds A radiogram (fig II) showed large root shadows and generalised increased markings throughout both lung-fields, interpreted as congestive changes with old standing hilar adenitis She continued to run an intermittent fever Fat embolism was considered and the sputum and urine were sent for analysis The sputum contained a large number of neutrophil leucocytes and a few alveolar phagocytes There were occasional globules of extracellular fat On Sept 3 the cough was rather worse and the temperature still raised She had a sore throat and signs of follicular tonsillitis There was impaired resonance of the chest at the right base and soft bronchial breathing, but no moist sounds A radiogram showed mottling in the right lower lung and slighter changes on the left side, interpreted as pneumonic consolidation The sputum now contained a large number of extracellular globules of fat, considerably more than in the previous specimens There were numerous pus cells and the predominant organisms were pneumococci The whole picture suggested a pneumonic complication of fat-embolism A radiogram two days later showed less consolidation at the right base and appreciable enlargement of the main trunk of the pulmonary artery Ultimately the patient's condition settled though she continued to have a cough with sputum The fracture was never manipulated and no anæsthetic was given She was treated as a case of pneumonia

This appears to be a case of pulmonary fat-embolism in a patient with chronic bronchitis Subsequently she developed pneumonia and later recovered

CASE 4

A man, aged 34, admitted to the Radcliffe Infirmary on the night of Sept 3, 1941, having been knocked off his bicycle by a heavy lorry The lorry wheel is said to have passed over the lower part of the front of his chest He was a well built man, shocked, pale, sweating and anxious, his respirations were rapid and shallow, temperature 98 5° F and blood-pressure 100/70 mm Hg He had a lacerated wound on the inner side of the right thigh above the knee, the skin was severely damaged and the wound dirty Radiograms showed a fracture of the shaft of the femur with shortening There was bruising over the left lower ribs, diminished movement of the left chest and weak breath sounds, percussion note normal No history of previous chest trouble A radiogram (fig III) revealed mottling throughout the left lung field, interpreted as pneumonic consolidation probably due to pulmonary concussion The wound was excised and sutured under local anæsthesia A Steinmann's pin was driven through the head of the tibia and the leg put up in a Thomas splint with 30 lb traction Three days later the temperature was 100° F, chest expansion on the left side was very poor, the percussion note was impaired and the breath sounds were very weak. The hæmoglobin was 70% On the 10th the physical signs were similar but a radiogram showed that the consolidation was resolving The sputum contained numerous pus cells and an almost pure culture of *Staphylococcus aureus* was grown On the 16th he was still coughing, the physical signs on the left side showed improvement The sputum contained a large amount of extracellular fat with numerous neutrophil leucocytes The appearances were very suspicious of pulmonary fat-embolism On Oct 10, temperature, pulse and respirations were normal and there were no abnormal physical signs in his chest A radiogram showed clear lung fields A month later he still had a little cough with small quantities of sputum There was never any purpura or signs of a lesion of the central nervous system

This patient sustained direct violence to the chest wall Clinically and radiographically he was found to have extensive consolidation of the left lung, attributed to pulmonary concussion. Subsequently it was shown that there was pulmonary fat-embolism He developed a bronchitis but not a pneumonia Later he recovered, but has persistent bronchitis

COMMENTS

There should be no difficulty in diagnosing typical cases of pulmonary fat-embolism, for the signs have been clearly described, but there are probably many more less severe cases than is generally realised The diagnosis of every case with chest symptoms following an accident should therefore be carefully reviewed so that the frequency and clinical significance of fat-embolism may be known

The value of radiology in diagnosis has yet to be assessed, for few records have been published In cases with acute pulmonary anoxæmia it is unlikely that any useful information will be obtained, for the patients cannot keep still owing to respiratory distress and mental confusion Later, when the acute signs have abated, it should be possible to obtain satisfactory radiograms, as in case 1, whose films showed clouding of the lower lung fields and numerous areas of consolidation—the radiographic findings of acute pulmonary œdema Sopian and Scharles (1938), Whitaker (1939) and Kolmert (1939) have described similar changes Such records are confirmatory evidence of the clinical state but are not essential in diagnosis, for the clinical findings are characteristic

When clinical signs indicate that there may be a pulmonary lesion, a radiogram is of real assistance, for it will exclude all severe injuries of the chest and preexisting disease Blair (1941) has pointed out that good films are essential at the earliest possible moment Many relatively minor injuries such as fracture of the ribs, small effusions, or injuries to the lower lobes of the lungs, may not be visible in films taken in the wards and require the special facilities of a main radiographic department to demonstrate their presence, for the usual postero-anterior projection reveals only about two-thirds of the lungs and many portable films show much less

With proper radiographic technique, we may form a clinical conception of degrees of fat-embolism not severe enough to produce acute pulmonary œdema There is definite post-mortem evidence of these but little is known of their clinical significance Three of the cases described here had no characteristic clinical features of fat-embolism In case 2 there were signs of considerable respiratory deficiency and the radiogram showed no abnormality, but the clinical suspicions of fat-embolism were justified when quantities of fat were found in the sputum and urine next day From this case it seems that considerable quantities of fat may be held up in the lungs, sufficient to cause definite functional impairment, without producing radiographic changes Similar findings were at first found in case 3 This woman had longstanding chronic bronchitis and emphysema which must have considerably reduced the efficiency of her pulmonary capillary network Though there was no evidence of severe contusion at the site of injury, sufficient fat was probably liberated to cause a degree of fat-embolism which might not have inconvenienced a normal person but for which she was unable to compensate owing to an inadequate collateral capillary circulation Her bronchitis became worse and she developed consolidation at the right base The radiographic appearances were consistent with these findings except in one respect—that is, a film taken sixteen days after the accident showed an appreciable enlargement of the trunk of the pulmonary artery which was not shown in previous films In case 4 the clinical and radiographic findings were those of pulmonary concussion of the left lung and the right lung seemed normal Such fat-embolism as was present appeared to be without clinical significance

The diagnosis of pulmonary fat embolism by radiography of the chest was investigated by Jirka and Scuderi (1936) in dogs They describe a diffuse haziness or cloudiness of the pulmonary fields which developed within 20 min after oil had been injected into the blood stream, and concluded that radiograms should be of definite diagnostic aid in patients suffering from clinical fat embolism Their published films do not furnish convincing proof of their statements because they show significant technical variations In some films the shoulder girdles have not been drawn clear of the chest and in others the animal has not been held straight The shoulder girdles must be drawn clear or the upper lung fields appear relatively opaque, and if the animal is not held quite straight one or both lungs may show opacities or diminished translucency due to relative compression of the lung or to folds of skin Their interpretation of the radiogram of the lungs after their removal from the chest is also questionable, for unless the trachea is clamped or tied before the chest is opened the lungs collapse and may show radiographic appearances similar to those illustrated

Dr A E Barclay, Dr K J Franklin and Miss M M L Prichard, of the Nuffield Institute, Oxford, allowed us to examine the records of their experiments on adult cats and rabbits By cine-radiographic studies of the heart and lungs they followed the course of globules of iodised oil entering the thorax through the superior or inferior vena cava The oil collects in the most dependent parts of the lung, and considerable quantities may accumulate before there is any diminution in pulmonary translucency When the pulmonary vessels are well filled the lung becomes clouded, the appearances are then similar to those in case 1 and may be attributed to pulmonary œdema These experiments did not induce fat-embolism comparable to that observed in fracture cases, and we do not know whether œdema would have developed with much smaller quantities of oil if the animal had been kept under observation Further, iodised oil tends to be held up in the larger branches of the pulmonary artery, whereas the fat globules derived from tissue trauma are mostly much smaller and pass into the arterioles and capillaries Nevertheless, the experiments seem to confirm the clinical impression that considerable quantities of fat must be present before there are any appreciable radiographic changes

SUMMARY

The records of four surviving cases of pulmonary fat-embolism are given Only one had characteristic clinical or radiological signs

Radiography of the chest may be of some assistance in diagnosis of pulmonary fat-embolism Cases with acute pulmonary anoxæmia show considerable diminution of translucency of both lung fields and patchy mottling, the signs of acute pulmonary œdema Less severe cases may show no abnormality It is suggested that considerable quantities of fat may be retained in the lungs, sufficient to cause definite respiratory embarrassment, without producing radiographic changes

We wish to thank Mr Elliot Smith and Dr Hobson for permission to publish the records of case 1

Examination of Sputum in Suspected Fat-embolism

Warthin first suggested the examination of the sputum in cases of fat-embolism, and since that time it has been regarded with varying degrees of favour The method which has been adopted here is as follows

1 Make a thick smear of the sputum (by squeezing between two slides) covering two thirds of the surface of the slides
2 While the smear is still wet flood the slide with Sudan IV solution and leave for three minutes
3 Rinse in tap water
4 Counterstain with hæmatoxylin solution (either Weigert's iron hæmatoxylin or Ehrlich's acid hæmatoxylin) for three minutes
5 Rinse in tap water
6 Differentiate if necessary in 1% acid alcohol
7 Blue in tap water
8 Mount in Apathy's medium or glycerin jelly

The Sudan solution is prepared by making a saturated solution of Sudan IV (Revector 258) in equal quantities of acetone and 70% ethyl alcohol

In examining the stained specimens microscopically, the size and number of the fat globules should be noted together with the general morphology of the sputum In fat-embolism the fat is in the form of extracellular globules varying from 10 to 40μ in diameter and there is a moderate neutrophil cytology Histiocytes containing fat globules are not significant, for they are commonly found in chronic pulmonary disease It should be recognised that all that can be stated is that extracellular fat is present and that the appearances are compatible with fat-embolism If the patient has recently taken a meal containing fat the sputum may be contaminated by fat-containing saliva, and the presence of large numbers of buccal epithelial cells should make one suspect that the specimen does contain saliva In a case of inhalation pneumonia, the sputum contained striated muscle fibres as well as extracellular fat and the finding confirmed the diagnosis of inhalation pneumonia, but gave no information with regard to fat-embolism Fat should not be expected in any significant amount in the sputum until *at least 36 hours after the onset of pulmonary symptoms*, and in cases of fat-embolism usually increases in amount during the succeeding few days

I am indebted to my assistant, Mr Reginald Duffett, who evolved this method of staining the sputum

REFERENCES

Blair, L G (1941) *Proc R Soc Med* 35, 97
Jirka, F J and Scuderi, C S (1936) *Arch Surg* 38, 708
Kolmert, F (1939) *Acta chir scand* 83, 263
Robb Smith, A H T (1941) *Lancet*, i, 135
Sopian, A and Scharles F H (1938) *J Minn med Ass* 35, 391
Whitaker, J C (1939) *Arch Surg* 39, 182

Reviews of Books

Development of the Sciences

(2nd series) Editor Prof L L WOODRUFF London Humphrey Milford, Oxford University Press Pp 336 18*s* 6*d*

THE second series of public lectures given by members of the Yale University scientific staff are difficult to classify As public lectures they might have been expected to present the intelligent layman with an account of the progress and present position of the various branches of knowledge with which they deal, but not all the authors are equally successful in this attempt Some seem to find simple exposition of an abstruse subject too difficult, or forgetting their audience, employ a phraseology which is incomprehensible without previous training The art of popularising scientific progress is not easily acquired The familiar gibe against our own profession that we wrap up simple propositions in obscure jargon is often deserved Language habitually—if not properly—used in addressing an advanced class is ill-adapted to the popular lecture The lectures present a historical sketch of the rise and development of the special subject followed by a review of current knowledge and hypotheses The articles which best fulfil the aim of education of the layman are those on geology and biology, because in both the lecturers have been careful to use language which if not ordinary is at least accurately explained

The close interdependence of all lines of scientific inquiry is made clear Now one science, now another makes a striking advance into the unknown and is almost immediately followed by all the others, so that the line is again straightened and the salient swallowed into a new front from which a new salient may be pushed out in an entirely different direction Sometimes the advance is made, not through the efforts of the scientific expert, but through the unexpected results of commercial enterprise, for instance much of our more recent knowledge of geology derives from the researches of the petroleum industry, and the industrial chemist has sometimes made discoveries which have broader meanings than he realises Progress seems to have been rapid in the last generation, yet as Professor Woodruff says, " the end of the journey is still far below the horizon " And always will be, ahead

" Gleams that untravelled world whose margin fades
Forever and forever as we move "

Tropical Medicine

(4th ed) Sir LEONARD ROGERS, M D Lond, F R C S, F R S, Sir JOHN MEGAW, M B Belf London J and A Churchill Pp 536 21*s*

THIS work first saw light in 1930, and has since become one of the standard textbooks Fresh material has been added to the new edition but the number of pages has been slightly reduced by judicious pruning The classification of diseases, however, is not wholly satisfactory, it is a pity, for example, that amœbic hepatitis and liver abscess should be separated from amœbic dysentery by about half the volume, and that cutaneous leishmaniasis should be similarly divorced from the visceral disease, though post-kala-azar dermal leishmaniasis is dealt with under the heading of its precursor, kala azar Espundia, the mucocutaneous leishmaniasis of South America, receives rather inadequate attention Except for ankylostomiasis, the common intestinal helminthiases escape notice, and so do cysticercosis and paragonimiasis, trachoma, Rift Valley fever and psittacosis The essential features of the treatment of blackwater fever are well set out, but it might have been wise to emphasise that alkalis are given to make and keep the urine alkaline, so as to forestall the formation of acid hæmatin which may block the renal tubules and cause anuria In the section on tick-borne relapsing fevers no differentiation is made between the Central African form conveyed from man to man by ornithodorus and those tick-borne fevers, found elsewhere, which are sporadically acquired from various mammals through sundry ticks In the section on the typhuses, recent American work—which apparently proves the mutation of the flea-borne endemic murine disease to the louse-borne epidemic form in Mexico—should surely have found a place, and the fact that the habitat of the organisms of the tick-borne typhuses is intranuclear while that of other forms is intracytoplasmic is at least as valuable in differentiating them as minor morphological differences, which are never very distinctive with such pleomorphic organisms The constitution of 'Fouadin,' used in the treatment of bilharziasis, is not accurately given and the dosage is incorrect—an error perpetuated from the previous edition In 1942 sulphaguanidine merits mention in the treatment of bacillary dysentery, as do the sulphanilamide drugs in that of lymphogranuloma inguinale But these are chiefly errors of omission, and the book as a whole contains much useful material for students and practitioners of tropical medicine

THE LANCET

LONDON SATURDAY, FEBRUARY 21, 1942

CHOOSING THE FIGHTER

THE members of our Fighting Services need to be both numerous and efficient, and too close an attention to one of these attributes by selecting boards interferes with the attainment of the other The more carefully men are selected the fewer pass through the sieve, conversely, high quantity means poorer quality Fortunately doctors have enough experience of the wide range of what is normal and healthy to abstain from rejecting men who have a defect that has not interfered with active civilian life, fortunately, too, the Army is a highly organised body within which men of diverse physical and mental capacity can find a useful place It would be a sorry thing if examining medical boards assumed that the Services could only utilise men with the equipment of mind and body required, for example by an RAF pilot or a member of the Royal Armoured Corps But that does not mean that we should imperil efficiency by recruiting the halt and the maimed, the dull and the crazy Since physical disabilities can be recognised with some certainty, and standards of rejection or classification laid down for all to go by, there is little chance that the halt and the maimed will be admitted except where their advent is foreseen and provided for—the Pay Corps will have different standards of suitability from the Pioneer Corps, yet both may absorb men unsuited for an infantry regiment But where mental standards must be attained, clear guidance and the certain recognition of the unfit may be very hard to come by A standard of intellectual level may be set up, expressed in terms of percentile rating, as explained by SLATER in our columns [1], but men may unwittingly or by design obtain a disqualifyingly low score, not representative of their real intellectual capacity RAVEN [2] has lately indicated how important it is for the assessor to be aware of the varied influences thus reducing a score But intellectual defects are not the only psychological ones which will disqualify a man for military service, psychopathy of various sorts can be more disabling, more dangerous in a fighting unit than dullness or physical handicaps Yet it is no simple task to spot all the neurotics who will be incapable of useful military service, the men of psychopathic personality who will be detrimental to morale, the early schizophrenics, the potential suicides and the drunkards It is possible, however, to over-emphasise this difficulty, there are plenty of men unsuitable because of mental disabilities who can be spotted by doctors of average experience, even without special training, if they are on the watch for such cases and can take the time to examine them

Moral considerations sometimes bedevil the question The doctor says to himself, "This man reports all sorts of neurotic symptoms, but I have no objective evidence that what he says is true - it may be he is only trotting these things out to throw dust in my eyes and evade military service, if so, I will see that his contemptible design is thwarted" Clearly the question to be answered by the doctor is whether the man has a disqualifying illness, constitutional or otherwise—not whether his motives are laudable or shameful Some hold that the examining boards of the Ministry of Labour have not, on the whole, been able to detect as often as desirable the man who had later to be discharged from the Services on psychological grounds, others that any other system than that followed would have allowed a large amount of good material to slip back into the civilian sea, if the net had had too wide a mesh The problem has been tackled in the United States [3] under less urgent conditions Psychiatric examination has been as important in the procedure of the examining boards there during the last twelve months as the examination of the somatic systems At one medical induction board [4] 9652 minimal neuropsychiatric examinations were made between Feb 13 and April 15, 1941, with the consequent rejection of 2 5%—that is, of 242 men, more than a third of whom had some mental deficiency The examiners considered, however, that a further 6% of the men accepted for military service were dubious, on neuropsychiatric grounds, and they thought it important to designate such men as "borderline" at the outset and to ascertain their subsequent military history, thus a well-founded revision of existing standards of suitability, in either direction, might be made The writer of the article adds pointedly "There is, in fact, just as much need to classify examiners as to classify examinees, in order that statistical evidence in the future may be interpreted correctly in terms of the minimal standards set for scientifically trained psychiatrists" The problems and resources of the U S, however, are not identical with ours Here, it is probably correct to say, some men have been accepted for the Services whose disabilities, physical or psychological, could have been detected without hesitation if there had been either more time or more care expended on the initial examination, but the number, among these, with psychological defects obvious at the time of examination is not particularly large in comparison with those whose disabilities have come to light later, under the conditions of military training or active service Only people confident in wisdom after the fact would insist that men in the last category could certainly have been detected by doctors who are not specialists in the psychiatric field

The task would be easier if we all knew where character stops and disease begins Is psychopathic personality a disease? Is eccentricity? Is delinquency? It may be as easy to say "No" as to assert that a person with a still symptomless carcinoma is not ill or that low sugar-tolerance is not in itself a disease Whether the comparison be exact or not, such problems are commoner in psychological than in physical medicine COOK and SARGANT [5] point out that the recognition of psychological illness is as important and economical a procedure as the recognition of physical disease Moreover it should be borne in mind that physical disease often gives rise to a neurotic syndrome The constitutional psychopathy has lain dormant and symptomless until some physical change has made possible its manifestation The physical change may have been one of cerebral structure and function, or it may have reduced or imperilled the integrity of some other parts of the body, so causing the fears and griefs which are the patient's reaction to a corporal threat The physician examining such patients must be equally on the alert for physical and mental disabilities, he neglects or over-emphasises either at the patient's peril, and he must pay regard not only to the symptoms under his nose (if he sniffs in the right direction) but also to the constitution out of which they have developed—something which he cannot by any means detect and diagnose as easily as he can a symptom-picture The problems of what has come to be called "psychosomatic medicine" are complicated. They are certainly not to be solved solely by a study of the psychological history of every patient (whether with physical or mental disease) nor by a study of the somatic state and history of every patient, but by a combination of these, critically carried out so that causes are not mistaken for effects, or concomitant phenomena for successive ones in a causal series There is also a wide difference between a neurosis masquerading as a physical disease (as in effort syndrome, hysterical blindness or alleged failure of dark-adaptation), a physical disease with partially psychological origins (such as a severe hysterical contracture), and a physical disease aggravated by psychological changes, as a gastric ulcer may be

---

[1] Slater, P *Lancet*, 1942, i 101

[2] Raven, J C *Ibid* p 115

[3] Menninger W C *War Med* 1941 1 843

[4] Aita J A *Ibid* 1941 p 769

[5] Cook, G T and Sargant, W *Lancet*, Jan 10, 1942 p 31

VIRUS OR VITAMIN?

STOMATITIS has long been recognised as a common disorder in infants and children with a rise in incidence during the latter months of the year, thus, in the autumn of 1938, five per cent of the outpatients seen at a large children's hospital suffered from this complaint Last autumn the disease increased in frequency and almost assumed epidemic proportions, moreover, adults were chiefly affected, particularly troops and munition workers As a result there have been speculations about the ætiology The cause of certain forms of stomatitis is known—thus it occurs with vitamin deficiencies, particularly of C and the B complex, in some infections, such as diphtheria, thrush and the exanthemata, and in certain blood diseases, such as leukæmia and agranulocytosis But as a rule the cause is unproven, which partially explains the numerous synonyms—more than 30—given to the disorder Another reason for this multiplicity of labels is that the disease has many manifestations—catarrhal, aphthous, ulcerative, membranous, gangrenous The widespread incidence of ulcerative stomatitis and marginal gingivitis among troops on active service in the last war produced another title "trench mouth" Sometimes there is a false membrane on the tonsils typical of Vincent's angina, at others a similar false membrane is present on the gums and adjacent tissues, smears from which often show the fusiform bacilli and spirochætes associated with Vincent's angina, and hence the condition has been called fusospirochætal stomatitis In a series of 115 cases in children, 67 being under the age of two years, PARSONS[1] found that the clinical manifestations and ætiology differed in infants and in older children In those under two the disease occurred chiefly in the artificially fed or those who made use of dummies, and, even when aphthous ulceration was the chief sign, was usually due to thrush The mouths of these infants had little or no odour and the cervical glands were not enlarged, but sometimes, albeit rarely, they developed thrush œsophagitis, a fatal complication first adequately described by EBBS[2] On the other hand, in the older children, the stomatitis, although often complicated by aphthous ulceration, was of the Vincent's type, and inflammation, offensive odour and glandular enlargement were the rule The disease in older children, therefore, resembles that seen in adults, and because of the fœtor is sometimes called fœtid stomatitis, although BLACK[3] prefers the title acute infectious gingivostomatitis

The evidence in favour of a causal relationship between the vitamin-B complex and stomatitis was reviewed in these columns two years ago[4] In view of the facts that KING[5] had successfully treated Vincent's angina with nicotinic acid, which is usually accepted as the chemical expression of the PP or pellagra-preventing factor, and that SEBRELL and BUTLER[6] had cured cheilosis, a form of angular stomatitis, with another component of the B complex, riboflavin or lactoflavin, two conclusions were reached These were, first, that nicotinic acid and riboflavin, either alone or in combination, have a therapeutic action on the mouth lesions of pellagra and pre pellagra, and secondly, that nicotinic acid cured the various forms of gingivitis and stomatitis associated with the presence of Vincent's organism It was also pointed out that nicotinic acid might act because it was lethal to these organisms or rendered the medium unsuitable for their growth, or because it improved the condition of the underlying tissues, thus preventing them obtaining a foothold There are, however, certain difficulties in a wholehearted acceptance of the vitamin-deficiency theory For instance, there is little evidence that the vitamin deficiencies have materially increased since the war, either in children or adults, for which due credit must be given to Lord WOOLTON and his medical advisers and to the disappearance of unemployment Moreover, the epidemic of stomatitis has occurred among troops who have a well-balanced and sufficient dietary, and although the epidemic now shows signs of fading away there has not been any corresponding dietary change in the Army or in the civil population Again, many of the recent cases have not shown a rapid or complete cure with nicotinic acid, indeed, they have improved as quickly with simple saline mouth-washes as with nicotinic acid Improvement may be rapid at first with both forms of treatment, but then the condition may hang fire and complete cure be long delayed The best results are obtained when the patient receives careful and efficient dental treatment, and PARSONS suggested in his letter last week that this explains the good results achieved by STUHL and COVENTRY,[7] rather than the exhibition of moderate doses of vitamin C Lastly, the infectious nature of stomatitis is difficult to explain from a vitamin deficiency, though it might be held that the disease is a ' conditioned infection," the infection being conditioned by the vitamin shortage In the stomatitis associated with scurvy there is no evidence that the number of fusiform bacilli and spirochætes in the mouth is increased,[5] and this supports the view that there is some specific relationship between nicotinic acid and Vincent's organisms, but a considerable body of opinion regards the fusospirochætal organisms as secondary invaders According to **Black**, there is no proof that the mouth spirochætes, fusiform bacilli, spirilla or vibrios, singly or in any combination, are capable of initiating infection in man

---

[1] Parsons, C G *Arch Dis Childh* 1940, 15, 43

[2] Ebbs, J H *Ibid*, 1938, 13, 211

[3] Black, W C *Amer J Dis Child* 1938, 56, 126

[4] *Lancet* 1940, ii, 46

[5] King, J D *Ibid*, p 32

[6] Sebrell W H and Butler, R E *Publ Hlth Rep*, *Wash* 1938, 53, 2252, 1939 54 2121

[7] Stuhl, F and Coventry, J B *Lancet*, 1942, i, 153

If vitamin deficiency and infection by fusospirochætal organisms are both unproved causes, is there reason for blaming some other infection ? With the exception of thrush, convincing evidence to connect any specific bacteria with the common forms of the condition is lacking, many organisms have been found in infected mouths, but since they are chiefly those found in the healthy mouth they seem likely to be secondary invaders Even so, they may become pathogenic, and it has been suggested that in young children thrush may act as the primary cause of Vincent's stomatitis, by preparing the ground on which the secondary invaders become active It is true that rarely stomatitis is associated with a specific bacterial infection, but these instances do not solve the general problem of causation For instance, stomatitis sometimes occurs in diphtheria, and gonococcal stomatitis has been reported **Walton**, **Graham** and **Lansdown**[8] have described three examples of ulcerative stomatitis in soldiers, in each of whom a diplococcus was obtained in smears and pure culture which was gram-positive and encapsulated but lacked many of the cultural, biological and serological properties of the pneumococcus This stomatitis did not respond to adequate sulphapyridine therapy, although transfusions of pooled whole blood seemed to act as a specific The mouths of these patients resembled those in Vincent's disease, but the unpleasant odour of that condition was absent, and **Walton** and his colleagues suggest that the blood-transfusions may have remedied a deficiency, perhaps of nicotinic acid, which had allowed infection with the diplococcus to occur There is, however, increasing evidence that stomatitis commonly arises from a virus infection Thus **Dodd**, **Boddington** and **Johnston**,[9] by inoculation into the cornea of the rabbit, produced from 27 out of 28 children suffering from gingivostomatitis lesions typical of those produced by the herpetic virus, and they demonstrated immunity to a known strain of herpetic virus in 7 out of 8 rabbits which survived the primary infection According to these workers, the disease is either transmitted from child to child or acquired from adults with labial herpes This work, which was done under the supervision of **Goodpasture**, does not furnish a complete answer to the question of causation because the herpetic virus has been recovered from the saliva of normal people, but if, in addition to finding the virus in the saliva of patients, antibodies against the virus were found in their blood, the evidence in favour of the virus as a causal factor would be greatly strengthened Such evidence has recently been produced by **McNair Scott** and **Steigman**,[10] who not only isolated the virus of herpes simplex from the mouths of children suffering from acute infectious gingivostomatitis but also found herpes-neutralising antibodies in their blood during convalescence They agree that the Vincent's-angina type of stomatitis is rare in infants, and say that herpetic stomatitis can be divided into two groups, primary and recurrent Primary herpetic stomatitis, which occurs in people who have not previously been infected with the herpetic virus, is the common stomatitis of children and shows the clinical picture of an acute systemic infection characterised by fever, irritability, soreness of the mouth, red swollen gums, oral fœtor and enlarged cervical glands The recurrent form may occur at any age after a primary infection with herpes, and is analogous to recurrent labial herpes, the local lesion may be severe and constitutional symptoms may be mild or absent They suggest that trench mouth may represent a primary herpetic infection in older people who have escaped a childhood infection

There is not yet sufficient evidence to form a definite judgment as to which of the two main schools of thought concerning the ætiology of ulcerative stomatitis is right—the vitamin-deficiency school or the herpes school Present opinion seems to rule out bacterial infection as the primary cause but to regard bacteria as secondary and possibly unimportant invaders It may be said that in infancy thrush can be accepted as the proved commonest cause of gingivostomatitis, but that in older children and adults the most convincing evidence so far adduced supports the view that the disease is due to infection with the virus of herpes simplex

THE CORPSE AT LAW

When a relative dies the layman is becoming ever more critical of his treatment and often expresses a doubt whether the doctor really knew what was wrong with him This embarrassing interest may keep the defence societies busy, but the layman's interest in diagnosis should support the doctor's desire to look and see, and so remove one of the difficulties in obtaining the routine section which all pathologists regard as essential for the advancement of medicine Doctor and relative being agreed there remains the material side of the problem, for we can only repeat what we had to say 8 years ago[11] that autopsies often have to be made under indecent conditions and in the complete absence of technical equipment That was partly the result of an antiquated statute, mentioned by a peripatetic correspondent (p 237), which forbad the removal of a corpse outside the parish But if that was valid within our time it lost its validity in 1936 when public-health legislation was codified and reissued in convenient form Section 141 of the Public Health Act 1875 said that a local authority *might*, and if required by the Local Government Board *should*, provide a mortuary, and s 143 said "any local authority *may* provide and maintain (otherwise than at a workhouse or at a mortuary)" a post-mortem room These sections were repealed and replaced by s 198 of the 1936 Act The old LGB had always insisted that the s 141 room must be different from the s 143 room (which must be "otherwise than at a mortuary"). It was apparently ruled in the old days that the coroner could not send a body to a mortuary for section but could order an autopsy on a body lying in a mortuary. The new s. 198 of the 1936 Act telescopes ss. 141 and 143 into one and says: "A local authority or a parish council *may*, and if required by the Minister *shall*, provide" (*a*) a mortuary and (*b*) a post-mortem room, and may make by-laws as to management and charges. This seems an improvement on ss. 141 and 143, because under s. 143 the local authority could not be required to provide the p.m. room, but under the 1936 Act it can be; and there is nothing to say that the p.m. room may not be at the mortuary any longer. Whether or no Elizabethan law prohibited the corpse leaving the parish, common law certainly laid on parish authorities the duty of providing some place for a corpse; presumably with some restriction on its removal because that might hamper the evidence for the coroner. Under the Coroners Amendment Act 1926 a coroner can now arrange for removal of a body out of his jurisdiction if he wants another coroner to inquire; the body may be brought back again (s. 16); and, if the coroner directs or requests a post-mortem, he may order the body to be removed to any place provided for the purpose within his jurisdiction (which, of course, is vastly wider than a parish), "or within any adjoining area in which another coroner has jurisdiction" (s. 24). Adjoining coroners can therefore pool accommodation for post-mortems. And finally the wording of s. 198 of the 1936 Act makes it clear that the Ministry of Health, if it likes, can insist on proper post-mortem accommodation. It remains to say that the position in London comes under another statute; but then London has had for many years public mortuaries that could stand comparison with an operating theatre.

---

[8] Walton, C H A Graham H M and Lansdown L P *Ibid* 1941 ii, 214

[9] Dodd K. Boddington, J and Johnston, L *Amer J Dis Child* 1939, 58, 907.

[10] McNair Scott, T F and Steigman, A J *J Amer med Ass* 1941 117 999

[11] *Lancet* 1934 i, 355

Annotations

WIND IN THE BOWEL

MUCH of the gas in the intestines is the unabsorbed residue of air swallowed with food and drink, or, in those who have the trick, alone. The composition of this air changes as it passes along the alimentary tract, because of the different diffusion rates of its contained gases, and nitrogen is the main constituent of the residue in the colon. Gas is formed in situ, especially in the colon, by the bacterial fermentation of cellulose and starchy food. Hence vegetarians and other hearty eaters of carbohydrates, like the herbivora, have always been subject to distension, borborygmi and the passage of flatus, and the greater amount of vegetables and bread eaten in war time seems to have led to some increase in flatulence. These gases are mainly composed of carbon dioxide and methane, and, as schoolboys are fond of demonstrating, are sometimes inflammable. During its passage along a healthy bowel gas is absorbed by the intestinal veins, and its excretion by the lungs is a common cause of foul breath. Absorption may be interfered with by causes producing general venous congestion, such as heart failure and pulmonary disorders, portal congestion, as in cirrhosis of the liver, or local venous congestion, as in volvulus, and gas will then accumulate even though there is no abnormal amount of carbohydrate fermentation going on. "Toxic" effects on the intestinal mucosa interfering with absorption may account for the meteorism of typhoid fever, and for the distressing distension of pneumonia, diphtheria and other infections. Sir Arthur Hurst, who draws attention to defective absorption as a cause of distension on another page, thinks it as common a one as intestinal carbohydrate dyspepsia. Defective absorption can probably be carried a stage further, for if the tension of carbon dioxide in the intestinal tissues and veins rises above that in the lumen diffusion will be reversed and carbon dioxide excreted into the gut. The flatulence of intestinal carbohydrate dyspepsia can always be relieved by limiting carbohydrates in the diet, but this has little effect on distension due to faulty absorption, and purgation may also be ineffective. Here treatment will depend on the cause, but Hurst in the case he describes, where the cause seems to have been a previous partial volvulus, gives a striking radiological demonstration of the efficacy of posterior pituitary extract in producing an immediate, thorough and painless evacuation of flatus. A daily injection of 'Pitressin' freed his patient from all discomfort with no ill effects, and she has been able slowly to reduce the dose. Mathez,[1] of Lausanne, who has made a detailed radiological study of meteorism in three cases of pulmonary tuberculosis, also found posterior pituitary extract strikingly effective, though he ascribes its success to its action in improving capillary circulation, whereas in Hurst's patient it clearly worked by instituting mass peristalsis. The papers by Hurst and Mathez draw attention to two other facts—what unexpected symptoms gas in the colon may produce, and how little the aerodynamics of the intestine have been studied radiologically.

FATIGUE IN AIRCRAFT PILOTS

BETWEEN 80% and 90% of civil aeroplane accidents in the United States are ascribed to "pilot error." That is to say, the expected hazards of flying, unexpectedly bad weather, low cloud, fog, icing, lightning and other acts of God, as well as all the mechanical defects—engine failure and the rest—account for only a little more than a tenth of all aeroplane crashes. McFarland[2] says that "in the early stages of the war the British pilots were evidently losing more planes in landing accidents in returning home from abroad than during actual combat with the enemy." Whether this was so or not, anyone who has experienced the weariness produced by eight or ten hours of operational flying knows that many of these crashes were also due to pilot error, for the inefficiency of fatigue must have played an important part. McFarland has reviewed the subject of fatigue in aviation and has assembled the main causes, as have Armstrong[3] and others before him. In civil aviation many of the causes of fatigue can be modified, but in war flying some must of necessity remain unchanged. Fatigue in war flying arises from physical and psychological stress. Some of the physical causes of fatigue can be lessened, although the requirements of operational flying and the design of combat planes present many difficulties. For instance, engine noise, vibration, glare from the fuselage, the discomfort of cramped positions, cold, difficult instrument reading at night, and even uncomfortable clothes all play a part and must be considered individually in relation to the pilot and to his duties. Other causes, often overlooked—irregular working hours, long periods of duty, curtailed sleep or unaccustomed hours of sleep with consequent alteration in feeding and living habits—must add considerably to the fatigue factors in a pilot's life. The physiological effects of prolonged flying at very high altitudes—30,000 ft. or more—or of repeated ascents and descents are not yet fully understood, but it is known that intellectual efficiency is diminished at heights over 12,000 ft. largely because of the relative anoxia.[4] It is even thought that there may be a cumulative ill effect from high altitude resulting in physical and mental deterioration[5] But the factors which are most pernicious in producing fatigue in pilots and other members of aircrew in war-time are psychological Viteles[6] has divided fatigue into three related phenomena "an overt manifestation in the form of reduced output in the task, known as work decrement, a physiological state involving changes in organic functions and the production of chemical products of fatigue, and a feeling of fatigue or tiredness" Now physiological evidence shows that fatigue of the degree met in man cannot be related to any peripheral changes, it is central in origin, and more psychological than physiological too Thus, although the pilot does not perform much physical work, and although intellectual work appears to require no extra energy in terms of calories[7] he can still become exhausted with fatigue Of the psychological causes, there are of course all those inseparable from Service life, those related to flying as such, and those arising from operational flying The first group include lack of sleep, alteration in the routine of life, uncertain leave, and frank overwork In the second group there is the alertness and constant vigilance needed in flying, the fine coordination, and the constant anxiety, for almost all seasoned pilots confess that they are aware of the dangers of aviation In operational flying awareness must be acute, the possibility of battle is always ahead, and if the bomber pilot avoids combat he has the anxiety of locating his target, evading "flak," searchlights and pursuit, and then finding his way home, often in hazardous conditions It is little wonder then that pilot error increases significantly at the end of an operational trip, for the first of Viteles's phenomena of fatigue, work decrement, has then begun to operate The problem of fatigue, which in peace time was the affair of the industrial psychologist, has in consequence become one of the main concerns of the Royal Air Force doctor and his scientific advisers

---

[1] Mathez, J. A. *Helv. med. Acta*, 1941, 8, 525.

[2] McFarland, R. A. *New Engl. J. Med.* 1941, 225, 845.

[3] Armstrong, H. G. Aviation Medicine, London, 1939.

[4] McFarland, *Res. Publ. Ass. nerv. ment. Dis.* 1939, 19, 112.

TYPHUS FEVER CONTROL

ENGLISH doctors have had little enough opportunity for many years now to become familiar with typhus at home Thus when occasional cases have appeared they have sometimes been misdiagnosed, and preventive measures have not been taken as soon as they might have been The continental epidemics make it necessary for us to prepare for cases here, and the Minister of Health proposes to form a panel of 8 or 10 men living in different parts of the country, who have clinical experience of the disease These will be able to help with diagnosis in and about the districts in which they live Several suitable men are available in London, Lancashire, Yorkshire and the North Midlands, and Sir Wilson Jameson, the chief medical officer of the Ministry, would like to hear from medical men or women in other parts of England and Wales who have the necessary clinical experience and who are willing to have their names put on the panel The Ministry will provide a fee of five guineas, with out of pocket expenses, when any member of the panel is called upon to act

INTRAPERITONEAL SULPHONAMIDES

THE employment of sulphonamides in the peritoneal cavity is a logical outcome of the position they have attained in the local treatment of wounds, though Newell[8] successfully treated two cases of pneumococcal peritonitis with intraperitoneal injections of sulphanilamide early in 1939, before its success in wound therapy had been established Last year Throckmorton[9] conducted a series of experiments in rats where various members of the sulphonamide group were introduced at laparotomy and the peritoneal exudate was withdrawn and examined at subsequent intervals After laparotomy only the polymorph concentration was but slightly raised and subsequent adhesion formation was minimal Sulphanilamide was completely absorbed in twelve hours and had practically no irritant effect, judged by the cellular response By contrast, sulphapyridine was extremely irritant, masses of the powder were found walled off as long as 14 days after its introduction and adhesions were common Sulphathiazole, on the other hand, although less soluble than sulphanilamide had no irritant effect In contrast to sulphanilamide it excited a prolonged leucocytic response, thereby enhancing the local defence mechanism Other sulphonamides tested had a definite irritant action From these results the choice seems to lie between sulphanilamide and sulphathiazole, the latter having the advantage of a more long-lasting effect

In established peritonitis sulphonamides in the peritoneal cavity are being increasingly employed Mueller[10] was one of the first in this field and has had successful results for over two years Complications were diminished, and he now employs the method as a routine in cases of abdominal infection Thompson[11] and others have also been using sulphanilamide locally in appendicitis, wherever peritoneal infection was apparent They had no deaths in over 200 cases, whereas their previous fatality was 2 7% No ill effects were observed and complications were few More recently Griswold and Antoncic[12] have used intraperitoneal sulphanilamide in perforated peptic ulcer They had previously observed a close relationship between the mortality and the presence of streptococci in the peritoneal exudate Judging from the few cases so far treated the fatality seems to have been lowered Gardiner[13] has been struck by the advantages of local implanation of sulphapyridine in peritonitis from various causes, particularly in its relation to wound healing He is one of the few to employ sulphapyridine in this way but has noted no irritant effects However he used drainage in nearly all his cases In the one case coming to autopsy there was no sulphapyridine apparent to the naked eye, but it would have been difficult to detect even if present

As well as in the obvious sphere of established peritonitis, sulphonamides might well be employed where the peritoneal cavity has been soiled either by trauma or at operation In resection or anastomosis of gut, even by so called aseptic methods, potential soiling occurs, particularly in dealing with the large intestine Hudson and his colleagues[14] assume that the high mortality associated with resection for intestinal obstruction is due mainly to peritonitis following contamination at operation This supposition may have its fallacies, but recovery followed in both cases where sulphanilamide was employed locally One patient died from another cause five weeks later, when it was found that the anastomosis was healthy and no adhesions were present In the second case the value of local sulphanilamide was difficult to estimate since sulphapyridine was also given intramuscularly In rabbits they found that local sulphanilamide gave a remarkable protection after deliberate contamination of the peritoneal cavity with intestinal contents, although its value in preventing peritoneal infection after resection was not striking Technical difficulties are serious in an animal of this size, and an imperfect suture line was probably responsible for the equivocal results obtained, resulting in delayed leakage at a time when the sulphanilamide had been absorbed This is borne out by clinical experience, where in large-bowel anastomosis and resection for acute intestinal obstruction the technical difficulties in forming room (which must be "otherwise than at a mortuary") It was apparently ruled in the old days that the coroner could not send a body to a mortuary for section but could order an autopsy on a body lying in a mortuary The new s 198 of the 1936 Act telescopes ss 141 and 143 into one and says "A local authority or a parish council *may*, and if required by the Minister *shall*, provide" (*a*) a mortuary and (*b*) a post-mortem room, and may make by-laws as to management and charges This seems an improvement on ss 141 and 143, because under s 143 the local authority could not be required to provide the p m room but under the 1936 Act it can be, and there is nothing to say that the p m room may not be at the mortuary any longer Whether or no Elizabethan law prohibited the corpse leaving the parish, common law certainly laid on parish authorities the duty of providing some place for a corpse, presumably with some restriction on its removal because that might hamper the evidence for the coroner Under the Coroners Amendment Act 1926 a coroner can now arrange for removal of a body out of his jurisdiction if he wants another coroner to inquire, the body may be brought back again (s 16), and, if the coroner directs or requests a post-mortem, he may order the body to be removed to any place provided for the purpose within his jurisdiction (which, of course, is vastly wider than a parish), "or within any adjoining area in which another coroner has jurisdiction" (s 24) Adjoining coroners can therefore pool accommodation for post-mortems And finally the wording of s 198 of the 1936 Act makes it clear that the Ministry of Health, if it likes, can insist on proper post-mortem accommodation It remains to say that the position in London comes under another statute, but then London has had for many years public mortuaries that could stand comparison with an operating theatre

---

[5] Corbett, C and Bazett H *Spec Rep Ser med Res Coun Lond*, No 53, 1920, p 18

[6] Viteles M S Industrial Psychology New York 1932

[7] Benedict F G and Benedict C G Mental Effort in Relation to Gaseous Exchange Heart Rate and Mechanics of Respiration Washington, 1933

[8] Newell E T *Surg Gynec Obstet* 1939, 68 760

[9] Throckmorton T D *Proc Mayo Clin* 1941, 16 423

[10] Mueller, R S *J Amer med Ass* 1941 116 329

[11] Thompson J E Brabson, J A and Walker, J M *Surg Gynec Obstet* 1941, 72, 722

[12] Griswold, R A and Antoncic, R F *Ann Surg* 1941, 113, 791

[13] Gardiner R H *Lancet* 1942, i, 195

[14] Hudson, R V Selbie, F R and Smith, R *Ibid* 1941 i, 438

Annotations

WIND IN THE BOWEL

MUCH of the gas in the intestines is the unabsorbed residue of air swallowed with food and drink, or, in those who have the trick, alone The composition of this air changes as it passes along the alimentary tract, because of the different diffusion rates of its contained gases, and nitrogen is the main constituent of the residue in the colon Gas is formed in situ, especially in the colon, by the bacterial fermentation of cellulose and starchy food Hence vegetarians and other hearty eaters of carbohydrates, like the herbivora, have always been subject to distension, borborygmi and the passage of flatus, and the greater amount of vegetables and bread eaten in war-time seems to have led to some increase in flatulence These gases are mainly composed of carbon dioxide and methane, and, as schoolboys are fond of demonstrating, are sometimes inflammable During its passage along a healthy bowel gas is absorbed by the intestinal veins, and its excretion by the lungs is a common cause of foul breath Absorption may be interfered with by causes producing general venous congestion, such as heart failure and pulmonary disorders, portal congestion, as in cirrhosis of the liver, or local venous congestion as in volvulus, and gas will then accumulate even though there is no abnormal amount of carbohydrate fermentation going on "Toxic" effects on the intestinal mucosa interfering with absorption may account for the meteorism of typhoid fever, and for the distressing distension of pneumonia, diphtheria and other infections Sir Arthur Hurst, who draws attention to defective absorption as a cause of distension on another page, thinks it as common a one as intestinal carbohydrate dyspepsia Defective absorption can probably be carried a stage further, for if the tension of carbon dioxide in the intestinal tissues and veins rises above that in the lumen diffusion will be reversed and carbon dioxide excreted into the gut. The flatulence of intestinal carbohydrate dyspepsia can always be relieved by limiting carbohydrates in the diet, but this has little effect on distension due to faulty absorption, and purgation may also be ineffective Here treatment will depend on the cause, but Hurst in the case he describes, where the cause seems to have been a previous partial volvulus, gives a striking radiological demonstration of the efficacy of posterior pituitary extract in producing an immediate, thorough and painless evacuation of flatus A daily injection of 'Pitressin' freed his patient from all discomfort with no ill effects, and she has been able slowly to reduce the dose Mathez,[1] of Lausanne, who has made a detailed radiological study of meteorism in three cases of pulmonary tuberculosis, also found posterior pituitary extract strikingly effective, though he ascribes its success to its action in improving capillary circulation, whereas in Hurst's patient it clearly worked by instituting mass peristalsis The papers by Hurst and Mathez draw attention to two other facts—what unexpected symptoms gas in the colon may produce, and how little the aerodynamics of the intestine have been studied radiologically

FATIGUE IN AIRCRAFT PILOTS

BETWEEN 80% and 90% of civil aeroplane accidents in the United States are ascribed to "pilot error" That is to say, the expected hazards of flying, unexpectedly bad weather, low cloud, fog, icing, lightning and other acts of God, as well as all the mechanical defects—engine failure and the rest—account for only a little more than a tenth of all aeroplane crashes McFarland[2] says that "in the early stages of the war the British pilots were evidently losing more planes in landing accidents in returning home from abroad than during actual combat with the enemy" Whether this was so or not, anyone who has experienced the weariness produced by eight or ten hours of operational flying knows that many of these crashes were also due to pilot error, for the inefficiency of fatigue must have played an important part McFarland has reviewed the subject of fatigue in aviation and has assembled the main causes, as have Armstrong[3] and others before him In civil aviation many of the causes of fatigue can be modified, but in war flying some must of necessity remain unchanged Fatigue in war flying arises from physical and psychological stress Some of the physical causes of fatigue can be lessened, although the requirements of operational flying and the design of combat planes present many difficulties For instance, engine noise, vibration, glare from the fuselage, the discomfort of cramped positions, cold, difficult instrument reading at night, and even uncomfortable clothes all play a part and must be considered individually in relation to the pilot and to his duties Other causes, often overlooked—irregular working hours, long periods of duty, curtailed sleep or unaccustomed hours of sleep with consequent alteration in feeding and living habits—must add considerably to the fatigue factors in a pilot's life The physiological effects of prolonged flying at very high altitudes—30,000 ft or more—or of repeated ascents and descents are not yet fully understood, but it is known that intellectual efficiency is diminished at heights over 12,000 ft largely because of the relative anoxia[4] It is even thought that there may be a cumulative ill effect from high altitude resulting in physical and mental

---

1 Mathez, J A *Helv med Acta*, 1941, 8, 525
2 McFarland, R A *New Engl J Med* 1941, 225, 845
3 Armstrong, R G Aviation Medicine London 1939
4 McFarland, *Res Publ Ass nerv ment Dis* 1939, 19, 112

deterioration[5] But the factors which are most pernicious in producing fatigue in pilots and other members of aircrew in war time are psychological Viteles[6] has divided fatigue into three related phenomena "an overt manifestation in the form of reduced output in the task, known as work decrement, a physiological state involving changes in organic functions and the production of chemical products of fatigue, and a feeling of fatigue or tiredness" Now physiological evidence shows that fatigue of the degree met in man cannot be related to any peripheral changes, it is central in origin, and more psychological than physiological too Thus, although the pilot does not perform much physical work, and although intellectual work appears to require no extra energy in terms of calories[7] he can still become exhausted with fatigue Of the psychological causes, there are of course all those inseparable from Service life, those related to flying as such, and those arising from operational flying The first group include lack of sleep, alteration in the routine of life, uncertain leave, and frank overwork In the second group there is the alertness and constant vigilance needed in flying, the fine coordination, and the constant anxiety, for almost all seasoned pilots confess that they are aware of the dangers of aviation In operational flying awareness must be acute, the possibility of battle is always ahead, and if the bomber pilot avoids combat he has the anxiety of locating his target, evading "flak," searchlights and pursuit, and then finding his way home, often in hazardous conditions It is little wonder then that pilot error increases significantly at the end of an operational trip, for the first of Viteles's phenomena of fatigue, work decrement, has then begun to operate The problem of fatigue, which in peace time was the affair of the industrial psychologist, has in consequence become one of the main concerns of the Royal Air Force doctor and his scientific advisers

TYPHUS FEVER CONTROL

ENGLISH doctors have had little enough opportunity for many years now to become familiar with typhus at home Thus when occasional cases have appeared they have sometimes been misdiagnosed, and preventive measures have not been taken as soon as they might have been The continental epidemics make it necessary for us to prepare for cases here, and the Minister of Health proposes to form a panel of 8 or 10 men living in different parts of the country, who have clinical experience of the disease These will be able to help with diagnosis in and about the districts in which they live Several suitable men are available in London, Lancashire, Yorkshire and the North Midlands, and Sir Wilson Jameson, the chief medical officer of the Ministry, would like to hear from medical men or women in other parts of England and Wales who have the necessary clinical experience and who are willing to have their names put on the panel The Ministry will provide a fee of five guineas, with out-of-pocket expenses, when any member of the panel is called upon to act

INTRAPERITONEAL SULPHONAMIDES

THE employment of sulphonamides in the peritoneal cavity is a logical outcome of the position they have attained in the local treatment of wounds, though Newell[8] successfully treated two cases of pneumococcal peritonitis with intraperitoneal injections of sulphanilamide early in 1939, before its success in wound therapy had been established Last year Throckmorton[9] conducted a series of experiments in rats where various members of the sulphonamide group were introduced at laparotomy and the peritoneal exudate was withdrawn and examined at subsequent intervals After laparotomy only the polymorph concentration was but slightly raised and subsequent adhesion formation was minimal Sulphanilamide was completely absorbed in twelve hours and had practically no irritant effect, judged by the cellular response By contrast, sulphapyridine was extremely irritant, masses of the powder were found walled off as long as 14 days after its introduction and adhesions were common Sulphathiazole, on the other hand, although less soluble than sulphanilamide had no irritant effect In contrast to sulphanilamide it excited a prolonged leucocytic response, thereby enhancing the local defence mechanism Other sulphonamides tested had a definite irritant action From these results the choice seems to lie between sulphanilamide and sulphathiazole, the latter having the advantage of a more long-lasting effect

In established peritonitis sulphonamides in the peritoneal cavity are being increasingly employed Mueller[10] was one of the first in this field and has had successful results for over two years Complications were diminished, and he now employs the method as a routine in cases of abdominal infection Thompson[11] and others have also been using sulphanilamide locally in appendicitis, wherever peritoneal infection was apparent They had no deaths in over 200 cases, whereas their previous fatality was 2 7% No ill effects were observed and complications were few More recently Griswold and Antoncic[12] have used intraperitoneal sulphanilamide in perforated peptic ulcer They had previously observed a close relationship between the mortality and the presence of streptococci in the peritoneal exudate Judging from the few cases so far treated the fatality seems to have been lowered Gardiner[13] has been struck by the advantages of local implanation of sulphapyridine in peritonitis from various causes, particularly in its relation to wound healing He is one of the few to employ sulphapyridine in this way but has noted no irritant effects However he used drainage in nearly all his cases In the one case coming to autopsy there was no sulphapyridine apparent to the naked eye, but it would have been difficult to detect even if present

As well as in the obvious sphere of established peritonitis, sulphonamides might well be employed where the peritoneal cavity has been soiled either by trauma or at operation In resection or anastomosis of gut, even by so called aseptic methods, potential soiling occurs, particularly in dealing with the large intestine Hudson and his colleagues[14] assume that the high mortality associated with resection for intestinal obstruction is due mainly to peritonitis following contamination at operation This supposition may have its fallacies, but recovery followed in both cases where sulphanilamide was employed locally One patient died from another cause five weeks later, when it was found that the anastomosis was healthy and no adhesions were present In the second case the value of local sulphanilamide was difficult to estimate since sulphapyridine was also given intramuscularly In rabbits they found that local sulphanilamide gave a remarkable protection after deliberate contamination of the peritoneal cavity with intestinal contents, although its value in preventing peritoneal infection after resection was not striking Technical difficulties are serious in an animal of this size, and an imperfect suture line was probably responsible for the equivocal results obtained resulting in delayed leakage at a time when the sulphanilamide had been absorbed This is borne out by clinical experience, where in large bowel anastomosis and resection for acute intestinal obstruction the technical difficulties in forming room (which must be "otherwise than at a mortuary") It was apparently ruled in the old days that the coroner could not send a body to a mortuary for section but could order an autopsy on a body lying in a mortuary The new s 198 of the 1936 Act telescopes ss 141 and 143 into one and says "A local authority or a parish council *may*, and if required by the Minister *shall*, provide" (*a*) a mortuary and (*b*) a post-mortem room, and may make by-laws as to management and charges This seems an improvement on ss 141 and 143, because under s 143 the local authority could not be required to provide the p m room but under the 1936 Act it can be, and there is nothing to say that the p m room may not be at the mortuary any longer Whether or no Elizabethan law prohibited the corpse leaving the parish, common law certainly laid on parish authorities the duty of providing some place for a corpse, presumably with some restriction on its removal because that might hamper the evidence for the coroner Under the Coroners Amendment Act 1926 a coroner can now arrange for removal of a body out of his jurisdiction if he wants another coroner to inquire, the body may be brought back again (s 16), and, if the coroner directs or requests a post-mortem, he may order the body to be removed to any place provided for the purpose within his jurisdiction (which, of course, is vastly wider than a parish), "or within any adjoining area in which another coroner has jurisdiction" (s 24) Adjoining coroners can therefore pool accommodation for post-mortems And finally the wording of s 198 of the 1936 Act makes it clear that the Ministry of Health, if it likes, can insist on proper post-mortem accommodation It remains to say that the position in London comes under another statute, but then London has had for many years public mortuaries that could stand comparison with an operating theatre

---

[5] Corbett, C and Bazett, H *Spec Rep Ser med Res Coun Lond*, No 53, 1920, p 18

[6] Viteles M S Industrial Psychology New York 1932

[7] Benedict, F G and Benedict C G Mental Effort in Relation to Gaseous Exchange Heart Rate and Mechanics of Respiration Washington, 1933

[8] Newell F T *Surg Gynec Obstet* 1939 68 760

[9] Throckmorton, T D *Proc Mayo Clin* 1941, 16 423

[10] Mueller R S *J Amer med Ass* 1941 116, 329

[11] Thompson J E Brabson J A and Walker, J M *Surg Gynec Obstet* 1941, 72 722

[12] Griswold, R A and Antoncic, R F *Ann Surg* 1941, 113, 791

[13] Gardiner R H *Lancet* 1942, i, 195

[14] Hudson, R V Selbie, F R and Smith R *Ibid*, 1941 i, 438

Annotations

WIND IN THE BOWEL

MUCH of the gas in the intestines is the unabsorbed residue of air swallowed with food and drink, or, in those who have the trick, alone The composition of this air changes as it passes along the alimentary tract, because of the different diffusion-rates of its contained gases, and nitrogen is the main constituent of the residue in the colon Gas is formed in situ, especially in the colon, by the bacterial fermentation of cellulose and starchy food Hence vegetarians and other hearty eaters of carbohydrates, like the herbivora, have always been subject to distension, borborygmi and the passage of flatus, and the greater amount of vegetables and bread eaten in war time seems to have led to some increase in flatulence These gases are mainly composed of carbon dioxide and methane, and, as schoolboys are fond of demonstrating, are sometimes inflammable During its passage along a healthy bowel gas is absorbed by the intestinal veins, and its excretion by the lungs is a common cause of foul breath Absorption may be interfered with by causes producing general venous congestion, such as heart failure and pulmonary disorders, portal congestion, as in cirrhosis of the liver, or local venous congestion, as in volvulus, and gas will then accumulate even though there is no abnormal amount of carbohydrate fermentation going on "Toxic" effects on the intestinal mucosa interfering with absorption may account for the meteorism of typhoid fever, and for the distressing distension of pneumonia, diphtheria and other infections Sir Arthur Hurst, who draws attention to defective absorption as a cause of distension on another page, thinks it as common a one as intestinal carbohydrate dyspepsia Defective absorption can probably be carried a stage further, for if the tension of carbon dioxide in the intestinal tissues and veins rises above that in the lumen diffusion will be reversed and carbon dioxide excreted into the gut. The flatulence of intestinal carbohydrate dyspepsia can always be relieved by limiting carbohydrates in the diet, but this has little effect on distension due to faulty absorption, and purgation may also be ineffective Here treatment will depend on the cause, but Hurst in the case he describes, where the cause seems to have been a previous partial volvulus, gives a striking radiological demonstration of the efficacy of posterior pituitary extract in producing an immediate, thorough and painless evacuation of flatus A daily injection of 'Pitressin' freed his patient from all discomfort with no ill effects, and she has been able slowly to reduce the dose Mathez,[1] of Lausanne, who has made a detailed radiological study of meteorism in three cases of pulmonary tuberculosis, also found posterior pituitary extract strikingly effective, though he ascribes its success to its action in improving capillary circulation, whereas in Hurst's patient it clearly worked by instituting mass peristalsis The papers by Hurst and Mathez draw attention to two other facts—what unexpected symptoms gas in the colon may produce, and how little the aerodynamics of the intestine have been studied radiologically

FATIGUE IN AIRCRAFT PILOTS

BETWEEN 80% and 90% of civil aeroplane accidents in the United States are ascribed to "pilot error" That is to say, the expected hazards of flying, unexpectedly bad weather, low cloud, fog, icing, lightning and other acts of God, as well as all the mechanical defects—engine failure and the rest—account for only a little more than a tenth of all aeroplane crashes McFarland[2] says that "in the early stages of the war the British pilots were evidently losing more planes in landing accidents in returning home from abroad than during actual combat with the enemy" Whether this was so or not, anyone who has experienced the weariness produced by eight or ten hours of operational flying knows that many of these crashes were also due to pilot error, for the inefficiency of fatigue must have played an important part McFarland has reviewed the subject of fatigue in aviation and has assembled the main causes, as have Armstrong[3] and others before him In civil aviation many of the causes of fatigue can be modified, but in war flying some must of necessity remain unchanged Fatigue in war flying arises from physical and psychological stress Some of the physical causes of fatigue can be lessened, although the requirements of operational flying and the design of combat planes present many difficulties For instance, engine noise, vibration, glare from the fuselage, the discomfort of cramped positions, cold, difficult instrument reading at night, and even uncomfortable clothes all play a part and must be considered individually in relation to the pilot and to his duties Other causes, often overlooked—irregular working hours, long periods of duty, curtailed sleep or unaccustomed hours of sleep with consequent alteration in feeding and living habits—must add considerably to the fatigue factors in a pilot's life The physiological effects of prolonged flying at very high altitudes—30,000 ft or more—or of repeated ascents and descents are not yet fully understood, but it is known that intellectual efficiency is diminished at heights over 12,000 ft largely because of the relative anoxia[4] It is even thought that there may be a cumulative ill effect from high altitude resulting in physical and mental deterioration.[5] But the factors which are most pernicious in producing fatigue in pilots and other members of aircrew in war-time are psychological. Viteles[6] has divided fatigue into three related phenomena: "an overt manifestation in the form of reduced output in the task, known as work decrement; a physiological state involving changes in organic functions and the production of chemical products of fatigue; and a feeling of fatigue or tiredness." Now physiological evidence shows that fatigue of the degree met in man cannot be related to any peripheral changes; it is central in origin and more psychological than physiological too. Thus although the pilot does not perform much physical work and although intellectual work appears to require no extra energy in terms of calories[7] he can still become exhausted with fatigue. Of the psychological causes, there are of course all those inseparable from Service life, those related to flying as such, and those arising from operational flying. The first group includes lack of sleep, alteration in the routine of life, uncertain leave and frank overwork. In the second group there is the alertness and constant vigilance needed in flying, the fine coördination, and the constant anxiety, for almost all seasoned pilots confess that they are aware of the dangers of aviation. In operational flying awareness must be acute; the possibility of battle is always ahead, and if the bomber pilot avoids combat he has the anxiety of locating his target, evading "flak," searchlights and pursuit, and then finding his way home, often in hazardous conditions. It is little wonder then that pilot error increases significantly at the end of an operational trip, for the first of Viteles's phenomena of fatigue, work-decrement, has then begun to operate. The problem of fatigue, which in peace time was the affair of the industrial psychologist, has in consequence become one of the main concerns of the Royal Air Force doctor and his scientific advisers.

---

[1] Mathez, J A *Helv med Acta*, 1941, 8, 525
[2] McFarland, R A *New Engl J Med* 1941, 225, 845
[3] Armstrong R G Aviation Medicine, London, 1939
[4] McFarland, *Res Publ Ass nerv ment Dis* 1939, 19, 112

TYPHUS FEVER CONTROL

ENGLISH doctors have had little enough opportunity for many years now to become familiar with typhus at home. Thus when occasional cases have appeared they have sometimes been misdiagnosed, and preventive measures have not been taken as soon as they might have been. The continental epidemics make it necessary for us to prepare for cases here, and the Minister of Health proposes to form a panel of 8 or 10 men living in different parts of the country, who have clinical experience of the disease. These will be able to help with diagnosis in and about the districts in which they live. Several suitable men are available in London, Lancashire, Yorkshire and the North Midlands, and Sir Wilson Jameson, the chief medical officer of the Ministry, would like to hear from medical men or women in other parts of England and Wales who have the necessary clinical experience and who are willing to have their names put on the panel. The Ministry will provide a fee of five guineas with out-of-pocket expenses, when any member of the panel is called upon to act.

INTRAPERITONEAL SULPHONAMIDES

THE employment of sulphonamides in the peritoneal cavity is a logical outcome of the position they have attained in the local treatment of wounds, though Newell[8] successfully treated two cases of pneumococcal peritonitis with intraperitoneal injections of sulphanilamide early in 1939, before its success in wound therapy had been established. Last year Throckmorton[9] conducted a series of experiments in rats where various members of the sulphonamide group were introduced at laparotomy and the peritoneal exudate was withdrawn and examined at subsequent intervals. After laparotomy only the polymorph concentration was but slightly raised and subsequent adhesion formation was minimal. Sulphanilamide was completely absorbed in twelve hours and had practically no irritant effect judged by the cellular response. By contrast sulphapyridine was extremely irritant; masses of the powder were found walled off as long as 14 days after its introduction and adhesions were common. Sulphathiazole, on the other hand, although less soluble than sulphanilamide had no irritant effect. In contrast to sulphanilamide it excited a prolonged leucocytic response, thereby enhancing the local defence mechanism. Other sulphonamides tested had a definite irritant action. From these results the choice seems to lie between sulphanilamide and sulphathiazole, the latter having the advantage of a more long-lasting effect.

In established peritonitis sulphonamides in the peritoneal cavity are being increasingly employed. Mueller[10] was one of the first in this field and has had successful results for over two years. Complications were diminished, and he now employs the method as a routine in cases of abdominal infection. Thompson[11] and others have also been using sulphanilamide locally in appendicitis, wherever peritoneal infection was apparent. They had no deaths in over 200 cases, whereas their previous fatality was 2.7%. No ill effects were observed and complications were few. More recently Griswold and Antoncic[12] have used intraperitoneal sulphanilamide in perforated peptic ulcer. They had previously observed a close relationship between the mortality and the presence of streptococci in the peritoneal exudate. Judging from the few cases so far treated the fatality seems to have been lowered. Gardiner[13] has been struck by the advantages of local implanation of sulphapyridine in peritonitis from various causes, particularly in its relation to wound healing. He is one of the few to employ sulphapyridine in this way but has noted no irritant effects. However he used drainage in nearly all his cases. In the one case coming to autopsy there was no sulphapyridine apparent to the naked eye but it would have been difficult to detect even if present.

As well as in the obvious sphere of established peritonitis sulphonamides might well be employed where the peritoneal cavity has been soiled either by trauma or at operation. In resection or anastomosis of gut, even by so-called aseptic methods, potential soiling occurs, particularly in dealing with the large intestine. Hudson and his colleagues[14] assume that the high mortality associated with resection for intestinal obstruction is due mainly to peritonitis following contamination at operation. This supposition may have its fallacies, but recovery followed in both cases where sulphanilamide was employed locally. One patient died from another cause five weeks later, when it was found that the anastomosis was healthy and no adhesions were present. In the second case the value of local sulphanilamide was difficult to estimate since sulphapyridine was also given intramuscularly. In rabbits they found that local sulphanilamide gave a remarkable protection after deliberate contamination of the peritoneal cavity with intestinal contents, although its value in preventing peritoneal infection after resection was not striking. Technical difficulties are serious in an animal of this size, and an imperfect suture line was probably responsible for the equivocal results obtained, resulting in delayed leakage at a time when the sulphanilamide had been absorbed. This is borne out by clinical experience, where in large bowel anastomosis and resection for acute intestinal obstruction the technical difficulties in forming

---

Corbett, C and Bazett H *Spec Rep Ser med Res Coun Lond* No 53, 1920, p 18

[6] Viteles M S Industrial Psychology New York 1932

[7] Benedict F G and Benedict C G Mental Effort in Relation to Gaseous Exchange Heart Rate and Mechanics of Respiration Washington 1933

[8] Newell F T *Surg Gynec Obstet* 1939 68 760

[9] Throckmorton T D *Proc Mayo Clin* 1941 16 423

[10] Mueller, R S *J Amer med Ass* 1941 116 329

[11] Thompson J E Brabson J A and Walker J M *Surg Gynec Obstet* 1941 72 722

[12] Griswold R A and Antoncic P F *Ann Surg* 1941, 113, 791

[13] Gardiner R H *Lancet* 1942, i 195

[14] Hudson R V Selbie F R and Smith R. *Ibid* 1941 i 438

a perfect suture-line are very real, and the cause of the peritoneal infection which may follow is more likely to be late leakage than operative contamination In Gardiner's[13] case of strangulated hernia with resection, the patient's condition began to deteriorate at a period when the suture-line would tend to be weakest, and at autopsy generalised plastic peritonitis was found, as in the cases described by Hudson, although sulphapyridine had been implanted The anastomosis appeared to be sound

The mode of action of sulphonamides in the peritoneal cavity must largely govern the technique employed It is now agreed that sulphonamides exert their bactericidal effect by virtue of their local concentration That this is so in the peritoneal cavity is supported by Mueller's[10] observation that although absorption was rapid the average blood concentration rose only to 7 mg per 100 c cm , in spite of the improved clinical results Most surgeons insert 10–15 g of the powder, implanting part in the tissues of the abdominal wall In those cases which are drained the concentration of sulphanilamide both locally and in the blood stream falls rapidly, and with increasing experience of this technique drainage will no doubt become less called for It is also important to keep up an effective concentration of sulphanilamide in the blood by other routes

IMMUNISATION WITH LIVING ORGANISMS AGAINST PNEUMONIC PLAGUE

THE last pandemic of plague began probably in the province of Yunnan in China and reached Canton in 1894 Since then plague has become endemic in many widely scattered countries not only in towns but in certain rural areas, more especially in Manchuria, California, South Africa and possibly in the Nilgiris in Southern India In those countries sylvatic plague is carried on not as a human or rat infection but as an enzootic of wild rodents on occasions it becomes epizootic although the exact reasons for the occurrence of epizootics are unknown They are probably connected with periodic cyclical variations in the rodent and flea populations Fluctuations in other animal populations may also play a part in the appearance of epizootics Wheeler, Douglas and Evans,[1] for instance, have found that sticktight fleas *Echidnophaga gallinacea* caught on the burrowing owl were infected with plague The burrowing owl, *Speotyto cunicularia*, lives in close association with ground squirrels in California while sticktight fleas are parasites not only of chickens and other domestic fowls but of rats, wild rodents, coyotes and various predatory birds When epizootics are present among rodents epidemics among human beings not infrequently follow In some of these epidemics the cases are predominantly pneumonic, as in the great Manchurian outbreak of 1910–11 when more than 50,000 cases of pneumonic plague are said to have occurred In South Africa the incidence of pneumonic cases has been fairly high in many of the mixed bubonic pneumonic outbreaks that have been reported since plague was first recorded in that country in 1899 Gale[2] has recently described an outbreak of pneumonic plague in a native reserve, Moroken, in the Kalahari a hundred miles north-west of Vryburg The outbreak in man was apparently preceded by a severe epizootic among veld rodents, especially multimammate mice and springhares Thirty-six deaths and one recovery from pneumonic plague are recorded Recovery is very rare and this one is of particular interest because the patient had been vaccinated 5–6 days before she came in contact with a case of pneumonic plague by a vaccine prepared by Grasset[3] containing attenuated living plague bacilli The incubation period was not prolonged by the injection of vaccine since it was about 3–4 days, the average for the series The living vaccine prepared at the South African Institute of Medical Research contains both the EV strain from the Pasteur Institute of Antananarivo in Madagascar which has been used by Girard and Robic[4] and the Tjiwidej strain from the Bandoeng Pasteur Institute which has been employed on a large scale in Java by Otten[5] Both strains are highly antigenic but have undergone spontaneous attenuation Rodents such as guineapigs and wild rats can tolerate 20,000 million living organisms of these attenuated strains injected subcutaneously although white mice and rats and the multimammate mouse die after smaller doses as a result of their susceptibility to the toxins liberated by the bacilli Curiously enough the degree of protection attained in guineapigs is higher with the EVs train than with the Tjiwidej strain though for unknown reasons the reverse is true in wild rats No evidence has been found that either of the strains ever reverts to its original virulence For human immunisation a dose of 1000 million living organisms is injected, the material having been kept in the ice-chest for 5–15 days Only very rarely is there any rise in temperature after injection of the vaccine while the local reaction is limited to a moderate swelling at the site of inoculation accompanied by some tenderness In relation to the Moroken outbreak of pneumonic plague 1000 people were vaccinated without any serious reaction As in so many field experiments however the exact value of the vaccine is difficult to assess since many vaccinated people were not afterwards exposed to any real risk Six people who had been vaccinated contracted pneumonic plague and five died but in all these five contact with a known case of pneumonic plague had occurred 0–6 days before immunisation The girl who recovered was the only one exposed to infection after immunisation Eighty four other people were vaccinated either within seven days of contact or before contact and as none of them developed plague their escape may have been the result of the immunisation The method is thus without danger and may well prove on more extensive investigation to be of considerable value in the field

Sir JOHN HEBB, the first director-general of the EMS, died on Feb 15, at Ronkswood Hospital, Worcester, to which he had lately been appointed medical superintendent Hebb became director general of medical services to the Ministry of Pensions in 1933, and five years later he was seconded to the Ministry of Health to organise the emergency services there He had a fine record both of war service and of general practice, and he devoted himself with the utmost enthusiasm to the new problems of civilian safety But his health failed and his services were recognised by the conferment of a knighthood before his formal retirement from both these posts at the end of last August He was in his 64th year

Dr WALTER HAWARD has been appointed director general of medical services to the Ministry of Pensions in place of the late Dr Herbert Lightstone

---

1 Wheeler, C M , Douglas, J R and Evans, F C *Science*, 1941, 94, 560
2 Gale, G W *Sth Afr med J* 1941, 15, 369
3. Grasset, E *Ibid*, p 373
4 Girard, G and Robic, J *Bull Off int Hyg publ* 1936, 28, 1078
5 Otten, L *Ind J med Res* 1936, 24, 73

MEDICAL TREATMENT OF EVACUEES IN NORTHERN IRELAND —The Ministry of Home Affairs ask that medical practitioners who may be called upon to prescribe medical treatment for people evacuated to the reception area should bear in mind that the full benefits of all the existing health and welfare services in the area are available to evacuees on the same basis as to normal residents , and that the return of any evacuee to an evacuation area for treatment should not be recommended unless the doctor is satisfied that the necessary treatment is not available in the reception area

In England Now

A Running Commentary by Peripatetic Correspondents

THE upper part of the stable door flapped violently to and fro with each icy gust of wind as it howled round the draughty farm buildings. Inside, on the frozen ground, there was the usual assortment of things to be seen in any farm outhouse—pitchforks, straw, sacking, a strawberry net, paint pots, part of an iron bedstead, a heap of swedes and an abandoned hen-coop. From nails in the rafters hung several sides of meat and a couple of superannuated outer covers, while on one of the walls an old harness suggested the more leisurely days which this building had once enjoyed. I protested mildly to the sergeant but was too cold after my journey to do anything but accept the situation. Other doctors had done coroner's post-mortems here before and one had even confessed to finding the barnyard surroundings restful after a hectic morning in the hospital. The sergeant murmured something to the effect that we could have had the byre had we preferred it, but it was less sheltered than the stable and wasn't so well lit! In one of the disused stalls lay a worthy collection of salvaged paper; in the other a battered body on a couple of packing-cases. My first concern was to differentiate rigor mortis from the generalised frozen state. Meanwhile the instruments had been spread out on an inverted pig trough and the village constable, with that courtesy which is universal in members of the police force, had gone in search of "nice hot water." They had thoughtfully provided disinfectant and towels and had even attempted to carry light on a flex from the nearest point, but the current was too weak. The only thing to do was to work with both stable doors fully open and to tolerate the arctic draught. The water arrived in a none too clean pig bucket. An abandoned watering-can would do fine to wash down the body, I was told. Giving the corpse a look of defiance, and with an admiring thought for the Spartan qualities of my predecessors, I reluctantly pulled off overcoat, jacket and shoes and stepped into the frozen spaciousness of the white wellingtons. Adhering strictly to ritual, I donned the thin damp shroud-like gown provided for my protection and welcomed the embrace of the leather apron, frigid though it was. Warming my gloved hands in the diluted pig swill I proceeded to cut through the frozen tissues, marvelling at the way in which parochialism is allowed to obstruct the course of Scientific Medicine. In spite of the open doors it was too dark in this gale swept outhouse to see the cut surface of the organs, and as one's mind and limbs were too numbed with cold to think clearly it was decided to eviscerate the poor fellow and examine his organs under more favourable circumstances in the laboratory. With the aid of the constable's torch we made a cursory examination of the external injuries as well as circumstances permitted. Concern was expressed at the possibility of confusing our merchandise with that of the legitimate butcher who had so kindly lent the premises for this afternoon's necropsy. A minor scare was caused when a hitherto silent spectator protested indelicately through one of the many gaps in the rafters and almost lost us the spleen. It turned out to be neither a bat nor an owl but a curious and obviously outraged Plymouth Rock. This proved to be medico-legally a difficult case and the autopsy was of course not well carried out.

I am told it was good Queen Bess who ordained that we must make our examinations under such unfavourable circumstances, for the necessary legislation is not yet approved whereby bodies can be moved out of a parish to the nearest pathological centre for autopsy. Perhaps the great queen's ministers thought it salutary for us to spend our afternoons as far as possible in country surroundings away from laboratories. It is possible, of course, that when the parish regulations were formulated the Tudors had little thought for pathologists and casualties resulting from excessive usage of mechanically propelled road vehicles. They certainly could have no notion of the advantages of having a bacteriological laboratory in proximity to the post-mortem room for rapid diagnosis, or of the need for a microscope when searching for fat-embolism.

I have recently performed autopsies in several institutions which boasted a post-mortem room, and found them without exception to have no form of heating, and most of them had no running water. Post-mortem rooms are mostly to be found behind hospital laundries, boiler houses, refuge dumps and slag heaps, while if they are the particular pride of the municipality they have a peculiar predilection for abattoirs and corporation yards, so that the pathologist is at least on nodding if not on thirst-quenching terms with dustmen, slaughtermen and knackers. One post-mortem room invariably has half an inch of water covering the floor, another is flooded out for days on end. Yet another boasts a permanent blackout, a flickering gas lamp and a door without a latch; on several occasions sheep have nosed their way in and taken fright at what they have seen.

Some distinction should be made between the corpse and the pathologist. At present the latter must wait on the former, although the corpse, which we are led to believe is likely to have much time on its hands, could help the pathologist enormously by taking the initiative and seeking his services in the hospital post-mortem room. Moreover, it may be desirable to keep the corpse cool until the time for autopsy arrives, but the pathologist does not share this tendency to decompose. On the contrary, with running water, both hot and cold, the chill off the corpse, a draught-proof room, and one of the many satisfactory forms of occasional heating the pathologist can work happily and with profit to all. Is it too much to hope that reformers who now so zealously work to improve the service of medicine will remember the plight of the parish-pump pathologist and recommend improvements without delay? Possibly there are not many areas remaining which adhere to the strict parochial outlook such as we have attempted to portray; I hope not.

The difficulties in the way of centralising autopsies to main hospitals are not insurmountable—this parish council will have to forgo an occasional five-shilling parking fee, that borough council will have to pay for the transfer of the corpse to the centre while the hospital itself will have to educate its patrons to the fact that the traffic of corpses is not entirely autochthonous, and therefore not necessarily a reflection on the skill of the medical staff. The retort that long-wanted reforms must now wait till after the war is ill-advised in this instance. War-time is ideal for instituting reforms and local authorities are naturally desirous of furthering the cause of medicine.

Your correspondent is far from peripatetic at the moment, for he is confined to bed with an illness caused through working in a damp, draughty and unheated post-mortem room.

* * *

When we die and the account is totted up—5 for a cure, minus 50 for a kill, lesser marks for intermediate results—then, by and large and without boasting, on the professional page I think at any rate most of us will at least not be overdrawn. If, as it should be, prevention is generously rewarded, if the Great Audit goes into detail and gives so much say, for each acarus or tænia destroyed or prevented, then one of the well-deserved multimillionaires of the future will undoubtedly be S. M. Lambert, author of "A Yankee Doctor in Paradise" (Boston: Little, Brown and Co., pp 386). Dr. Lambert worked for the Rockefeller Foundation in that area of the Pacific, the fringe of which is now being invaded by a peril even more dangerous than *Necator americanus*, the hookworm which was his principal foe. He spent 20 years there, and this book, this Pacific delight, brazed tears and laughter, tells lovingly of them. Everyone going into the Colonial Medical Service ought to be made to read it and Lord Moyne should learn passages by heart. Naturally in a book dealing with hard campaigning against hookworm some of the humour is of that boyish and excretory kind that makes all the world akin, like the story of the lost world, Rennell Island, whose inhabitants stampeded in terror when they finally grasped from demonstration what the small tin boxes were for. The subject was as tabu for them as it is in our suburbs. (Often I wonder what the Highest Brows laugh at. Very irregular verbs and preterpluperfects? Or perhaps they don't laugh, or perhaps there are no HBs.) Sometimes in my life I have read books and then met the authors—disappointing. But the Lambert I met many years ago in Suva and on the Pacific, the child of whose sweat, the Fiji medical school, I saw many times, and the Lambert I have been meeting again reading this book are the same. I should like to criticise this big-hearted and big-minded American with the same kindly discernment with which he deals with kings, governors, and cannibals, this man who has risked and done so much for the people of our Empire, but all I can say, and that very humbly is: as far as I know, here is Homo sapiens at his best. One golden thread running through the book is his brotherly affection for his disciples; yes, that is the word, for I have seen them. And I think the adjective is "wonderful," not in the worn sense, but more as David used it of Jonathan—"passing the love of women."

* * *

Having four hours to while away in one of our large cities I toured the bombed area, and meditated on the vagaries of blast that could suck out the windows, bring down the ceilings, demolish entire sides of walls and yet leave the electric light bulb intact on its dangling flex and the stag's head unharmed above the non-existent grate. Having gaped at a profusion of kippers, cakes and sausages in various shops, my attention was attracted by a Christian Science rest-room for the forces. The room was filled with flowers, armchairs, and copious writing materials; and Moses viewing the promised land could not have been more strongly attracted than I was. I hesitated to enter, not from sectarian scruples but lest the organisers, *by the pricking in their thumbs*, would detect me as inimical to their beliefs. I turned away, but those padded armchairs, those cunningly arranged reading-lamps proved too much and a couple of seconds later I was inside. Whatever part science plays, the welcome was certainly Christian. I was pressed to write to all my friends and relations at their expense, lured to the easiest chair and urged to read something. I was about to refuse this last offer, reflecting that "Aids to Diagnosis" would hardly be seemly, when I found I was being offered a copy of the *Christian Science Monitor*, a worthy American publication mainly remarkable for the astonishing profusion of its Swiss advertising. Lingerie shops, chocolate shops and hotels in Berne, Lucerne and where-have-you, urged the superiority of their wares and accommodation—I am still puzzled to know why, since Americans can hardly be flocking to Switzerland during the war. At this point my attention was painfully directed towards my hostess who, judging by the noise, was having a heart attack in her little office. I peered as far round the door as possible, but could only see the tips of her shoes. My first impulse was to offer assistance, but this was checked by the thought that she would probably bitterly resent any suggestion of medical aid. All the same the symptoms sounded alarming, and I compromised by moving nearer to her lair, determined that if the attack increased in violence or I heard the thud of a falling body nothing would stop me rushing in. For a long time all was quiet, and I was just being censured by the coroner when she swayed out of the office looking rather wan, but alive and on her feet. "Were you cold in that chair?" she asked so solicitously that I felt the blackest of impostors. "No, it's just that I've got a cold," I muttered hoarsely. Smiling tolerantly, she remarked that I had come to the right place to get rid of it. Perhaps I had; certainly the medical profession has never managed to get rid of one. Feeling however that I had tempted Providence sufficiently by weathering out her own attack with her I thanked her warmly and left.

* * *

For years I eschewed all books that did not touch on medicine. But there came a day when I had to abandon my work and take up blood-letting. I soon found the monotony almost intolerable. So I yielded to an old temptation and for nearly two years fairly wallowed in the books I had so long turned my back on. At first I shared the pleasures and hardships of the traveller; then, the early struggles of men to whom fortune had been kind. I passed on to men's ideas and thoughts in the essays of Lamb, Lucas (E. V.), Birrell and others. Something began to stir in me. Why should I always take what others gave? Why not try giving too? I found good friends to help me—Quiller-Couch on the Art of Writing; Raleigh on Writers and Writing; C. E. Montague's Writer's Notes on his Trade; Allbutt's Notes on the Writing of Scientific Papers; Somerset Maugham's Summing Up; and so on. On Raleigh's advice I took Hazlitt and read his essays with gusto. I stumbled on a trick of reading about someone I was interested in by someone who wrote well—Hazlitt by Leslie Stephen or by his daughter, Virginia Woolf (she wrote the better essay, I thought). Then came the big discovery. One day I casually turned over the pages of Julius Cæsar and found my attention held. I could read Shakespeare. Another author to my list. And what an author! I went through all the tragedies quickly and then read them slowly a second, third and fourth time. As with good music, further acquaintance ripened into friendship. My trusty guides, Hazlitt, Quiller-Couch, Raleigh and others were there again to help me, to show me where and how to look for the good things. And so the field grew ever bigger, until the time came for me to go back to my job—and to less time for reading. I had made some lifelong friends. I had also learnt how foolish I had been to deny myself the books that do not touch on medicine.

MEDICINE AND THE LAW

Overdose of Insulin

A RECENT inquest on a two-year old child at a Hertfordshire hospital showed that a fatal overdose of insulin had been administered through a misunderstanding of the label on the bottle. The child, when admitted, was suffering from impetigo and scabies. Special treatment was prescribed—5 units of insulin followed by 10 grammes of glucose. A sister, who consulted with a nurse as to the dose, misread the label on the insulin bottle. It contained the figures "5 c.c. (10 units = 1 c.c.)." She read this as "5 c.c. = 40 units"; her explanation was that she had picked up the bottle between finger and thumb and had thereby obscured part of the label. A dose of 10 minims (the supposed equivalent of 5 units on this mistaken basis) was administered between 8 and 9 P.M. A subsequent message from the doctor directed a second injection of 10 units of insulin followed by 20 grammes of glucose. This was given soon after midnight, another nurse helping. Next morning, about 7.20, the mistake was discovered. It was reported to the night sister who said that the doctor would be seeing the child in a few minutes. The doctor paid a routine visit at about 8.10 A.M. The child had a fit at 11 A.M. and was then again seen by the doctor who ordered more glucose. There was another fit at 2 P.M. and death, occurring later when all remedial measures had failed, was found due to hypoglycæmia.

Recording a verdict of "death from misadventure," the coroner said it was clear that the dose administered to the child was about five times that which was ordered. The instructions had been given plainly; the mistake arose in following them out. The doctor stated in evidence that he was not informed of the mistake till 3 P.M.—at least seven hours after it was discovered; he thought the child had been abnormally affected by the dose he had ordered; had he known earlier, he said, the steps taken might have been more effective. The coroner expressed himself as not satisfied that a full and proper admission of the error had been made to the doctor. The nurse had said that, having reported the matter to the night sister, she had done all that was required of her under ordinary hospital practice.

Whether or no there was any absence of candour, incidents of this kind suggest that, at any rate in present war conditions when training is sometimes less thorough, there should be a revision of the relative responsibilities of hospital staffs or of the cryptic methods of labelling dangerous remedies.

Artificial Limbs for Injured Workmen

Last week, in Redpath Brown & Co. *v.* Hayes the Court of Appeal gave a ruling which, so far as it goes, may help the rehabilitation of victims of industrial accidents. In effect the injured workman is not to be expected to provide for an artificial limb out of his own pocket; if the employers invite him to submit to amputation in order to lessen his incapacity and thereby to lessen their own liability to pay weekly compensation, they must furnish him with the necessary surgical appliance. Hitherto there have been several sources from which help might come. The man's approved society might provide the artificial limb if its funds permitted ; his employers might pay for it though they sometimes required him to bear half the cost , insurance companies, hospital contributory associations charitable societies or public-assistance authorities might come to his aid But these possibilities were hypothetical rather than definite Amputation may be a proper step towards rehabilitation The workman is often reluctant to undergo a surgical operation There should be some certain prospect of the provision of essential appliances to encourage him

In the case before the Court of Appeal the man s foot had been badly crushed four years ago A large part of the bone was removed after the accident He can now walk two miles slowly with the aid of a stick and can stand without crutches but he suffers considerable pain The question whether a further surgical operation is proper is one of fact for the arbitrator under the act to decide In the present case there was, as may often happen a divergence of expert opinion The court was told that one " eminent surgeon had expressed the view in February 1939, that the foot should have been amputated after the accident last May he saw the patient again and advised that amputation would be wise On the other hand another " eminent surgeon ' whom the workman himself consulted last September. thought that in the absence of any further deterioration of the condition of the foot amputation would be a ' high-handed ' course The workman having refused to undergo this surgical operation his employers asked for the review and termination of the weekly payments on the ground that the refusal was unreasonable While the Workmen s Compensation Act nowhere positively obliges workmen to undergo operations a series of decisions in 1909 established that anyone who refuses when no risk is involved and when cure is probable will thereafter be deemed to be suffering no longer from the effects of the accident but from his own refusal In the case of Hayes the county court judge thought that he had refused unreasonably ; he therefore reduced the weekly payments from 30*s* to 20*s* The Court of Appeal says that this was wrong If two ' eminent surgeons " give diametrically opposite advice with regard to a major operation said the Master of the Rolls it is impossible to call the workman unreasonable because he accepts the view of one rather than the other There is no legal novelty in this dictum It is well settled that it is not unreasonable for a man to follow the advice of his own medical attendant In Gracie *v* Clyde Spinning Co (1915) a Scottish court declared that where the workman's own doctor advised against operation his refusal could never (save in very special circumstances) be the proximate cause of his incapacity What was new in the Hayes case was the insistence that the employers ought to furnish and maintain an artificial limb if they ask the workman *to have his foot amputated* The employers made a belated offer to furnish one when the point was taken in the Court of Appeal The Master of the Rolls stated that, if this operation had been performed the workman would need an artificial limb for the rest of his life It was not a question whether the proposed operation was reasonable or likely to succeed but whether the workman was unreasonable in refusing to undergo it If he was invited to have his foot removed, but was given no security for obtaining the necessary limb, he could not possibly be said to be acting unreasonably in refusing the operation Thus the Court of Appeal puts upon the employers a new duty whereof the cost will doubtless be adjusted in the usual arrangements for insuring their risks The decision does not mean that all injured workmen will get artificial limbs at their employers' or the tax-payers expense We still await the overdue reforms of our statutory system of workmen's compensation which will somehow link it (as has been achieved in other countries) to a coördinated plan of restoring the incapacitated worker to such employment as he can perform But, within its limited range, the judges' new ruling is a welcome step in the desired direction

---

MEDICO LEGAL SOCIETY — A meeting of this society will be held at 26, Portland Place London W 1 on Thursday Feb 26 at 5 P M , when Dr Eric Gardner will read a paper on sudden death in water and from choking and suicidal hanging

Letters to the Editor

YOUNG LONDONERS IN WAR

SIR —In 1931 I was permitted to publish some comparisons between the average height and weight of an unselected consecutive series of sixteen year old London boys and girls 200 of each presenting themselves for employment in the Post Office, with a similar series of sixteen year old boys and girls examined 25 years before This showed that the boys of 1931 weighed upon an average 16 lb more and were 1½ in taller than their predecessors and that the girls weighed an average of 9 lb more and were 1 in taller than their predecessors These figures could not be taken in themselves as an index of all that is embraced in the vague term ' nutrition but they seemed to suggest—at any rate among the London youth from which the Post Office draws most of its young employees—a considerable average increase in general growth and stature

A similar comparison may be of interest between the fourteen year old London boys and girls examined for employment as boy messengers and girl probationers in 1938—the last complete year before the war—and those examined for similar employment in 1941 after 15 months of war Most of these boys and girls have been educated at elementary council schools and most of those examined in 1941 had been in London throughout the war. had known the air-raids of 1940 and early 1941 and had of course been subjected to the common rationing of foodstuffs The tables below show the average height and weight of 300 such boys and 200 such girls examined in 1938 and of 300 boys and 200 girls examined in 1941. *In both series* heights and weights were measured in indoor clothes without shoes and all those examined were between the ages of 14 and 14½

	BOYS		GIRLS	
	Av ht	Av wt	Av ht	Av wt
1938	5 ft 1½ in	7 st 6½ lb	5 ft 3 in	7 st 11¼ lb
1941	5 ft 2½ in	7 st 9 lb	5 ft 3 in	7 st 12 lb

In each group there were 46 boys weighing 9 st or over Out of the 300 boys examined in 1938 there were 20 rejections chiefly for defects of vision , among the 300 examined in 1941 there were only 10 rejections defects of vision being again the chief cause Among the 200 girls examined in 1938 there were 16 rejections 7 being for visual defects . out of 200 examined in 1941 there were 21 rejections 10 being for visual defects In both series at this particular age the girls on an average were slightly taller and slightly heavier than the boys But in spite of war conditions the girl entrants of 1941 were on an average as tall and weighed as much as those of 1938 while of the boys the 1941 entrants were *on an average an inch taller* and weighed 2½ lb more than their predecessors

H H BASHFORD
Chief Medical Officer of the Post Office
G P O E C 1

THE FUTURE STAFFING OF HOSPITALS

SIR —Professor Platt's article will no doubt prompt criticism He aims at multiplication of specialists and while he states that " men of outstanding ability form a small *elite* in any nation " he wishes to rid the specialist services of men who display a high standard of mediocrity The intellectual superiority of the specialists in his scheme is therefore impossible of attainment There is another factor which he has overlooked After 25 years of expensive education and a year or so as a houseman with pocket-money for salary the poorer members of the profession will not be stimulated to apply for positions as assistants registrars &c Many (and the number will grow) will be precluded financially others will wish to marry—a reasonable reaction to the way God made us—and will thus be unable to afford minor jobs at minor salaries especially with the prospect of not being re-employed after 5 years

He visualises the small town clinic and in his first paragraph allows for general practitioner hospitals Does he feel that the entire nation will wish to go to hospital after the war ? Before we decide to increase the number of specialists let us consider the requirements of the nation The nation must have fit men The man who suffers from a minor disability and is normally of whose sweat, the Fiji medical school, I saw many times, and the Lambert I have been meeting again reading this book are the same. I should like to criticise this big-hearted and big-minded American with the same kindly discernment with which he deals with kings, governors, and cannibals, this man who has risked and done so much for the people of our Empire, but all I can say, and that very humbly is as far as I know, here is Homo sapiens at his best One golden thread running through the book is his brotherly affection for his disciples , yes, that is the word, for I have seen them And I think the adjective is "wonderful," not in the worn sense, but more as David used it of Jonathan—"passing the love of women"

* * *

Having four hours to while away in one of our large cities I toured the bombed area, and meditated on the vagaries of blast that could suck out the windows, bring down the ceilings, demolish entire sides of walls and yet leave the electric light bulb intact on its dangling flex and the stag's head unharmed above the non-existent grate Having gaped at a profusion of kippers, cakes and sausages in various shops, my attention was attracted by a Christian Science rest-room for the forces The room was filled with flowers, armchairs, and copious writing materials , and Moses viewing the promised land could not have been more strongly attracted than I was I hesitated to enter, not from sectarian scruples but lest the organisers, by the pricking in their thumbs, would detect me as inimical to their beliefs I turned away, but those padded armchairs, those cunningly arranged reading-lamps proved too much and a couple of seconds later I was inside Whatever part science plays, the welcome was certainly Christian I was pressed to write to all my friends and relations at their expense, lured to the easiest chair and urged to read something I was about to refuse this last offer, reflecting that "Aids to Diagnosis" would hardly be seemly, when I found I was being offered a copy of the *Christian Science Monitor*, a worthy American publication mainly remarkable for the astonishing profusion of its Swiss advertising Lingerie shops, chocolate shops and hotels in Berne, Lucerne and where-have-you, urged the superiority of their wares and accommodation—I am still puzzled to know why, since Americans can hardly be flocking to Switzerland during the war. At this point my attention was painfully directed towards my hostess who, judging by the noise, was having a heart attack in her little office I peered as far round the door as possible, but could only see the tips of her shoes My first impulse was to offer assistance, but this was checked by the thought that she would probably bitterly resent any suggestion of medical aid All the same the symptoms sounded alarming, and I compromised by moving nearer to her lair, determined that if the attack increased in violence or I heard the thud of a falling body nothing would stop me rushing in For a long time all was quiet, and I was just being censured by the coroner when she swayed out of the office looking rather wan, but alive and on her feet "Were you cold in that chair ?" she asked so solicitously that I felt the blackest of impostors "No, it's just that I've got a cold," I muttered hoarsely Smiling tolerantly, she remarked that I had come to the right place to get rid of it Perhaps I had , certainly the medical profession has never managed to get rid of one Feeling however that I had tempted Providence sufficiently by weathering out her own attack with her I thanked her warmly and left

* * *

For years I eschewed all books that did not touch on medicine But there came a day when I had to abandon my work and take up blood-letting I soon found the monotony almost intolerable So I yielded to an old temptation and for nearly two years fairly wallowed in the books I had so long turned my back on At first I shared the pleasures and hardships of the traveller , then, the early struggles of men to whom fortune had been kind I passed on to men's ideas and thoughts in the essays of Lamb, Lucas (E V), Birrell and others Something began to stir in me Why should I always take what others gave ? Why not try giving too ? I found good friends to help me—Quiller-Couch on the Art of Writing , Raleigh on Writers and Writing , C E Montague's Writer's Notes on his Trade , Allbutt's Notes on the Writing of Scientific Papers , Somerset Maugham's Summing Up , and so on On Raleigh's advice I took Hazlitt and read his essays with gusto I stumbled on a trick of reading about someone I was interested in by someone who wrote well—Hazlitt by Leslie Stephen or by his daughter, Virginia Woolf (she wrote the better essay, I thought) Then came the big discovery One day I casually turned over the pages of Julius Cæsar and found my attention held I could read Shakespeare Another author to my list And what an author! I went through all the tragedies quickly and then read them slowly a second, third and fourth time As with good music, further acquaintance ripened into friendship My trusty guides, Hazlitt, Quiller-Couch, Raleigh and others were there again to help me, to show me where and how to look for the good things And so the field grew ever bigger, until the time came for me to go back to my job—and to less time for reading I had made some lifelong friends I had also learnt how foolish I had been to deny myself the books that do not touch on medicine.

MEDICINE AND THE LAW

Overdose of Insulin

A RECENT inquest on a two-year old child at a Hertfordshire hospital showed that a fatal overdose of insulin had been administered through a misunderstanding of the label on the bottle The child, when admitted, was suffering from impetigo and scabies Special treatment was prescribed—5 units of insulin followed by 10 grammes of glucose A sister, who consulted with a nurse as to the dose, misread the label on the insulin bottle It contained the figures "5 c c (40 units = 1 c c)" She read this as "5 c c = 40 units", her explanation was that she had picked up the bottle between finger and thumb and had thereby obscured part of the label A dose of 10 minims (the supposed equivalent of 5 units on this mistaken basis) was administered between 8 and 9 P M A subsequent message from the doctor directed a second injection of 10 units of insulin followed by 20 grammes of glucose This was given soon after midnight, another nurse helping Next morning, about 7 20, the mistake was discovered It was reported to the night sister who said that the doctor would be seeing the child in a few minutes The doctor paid a routine visit at about 8 10 A M The child had a fit at 11 A M and was then again seen by the doctor who ordered more glucose There was another fit at 2 P M and death, occurring later when all remedial measures had failed, was found due to hypoglycæmia

Recording a verdict of "death from misadventure," the coroner said it was clear that the dose administered to the child was about five times that which was ordered The instructions had been given plainly , the mistake arose in following them out The doctor stated in evidence that he was not informed of the mistake till 3 P M—at least seven hours after it was discovered , he thought the child had been abnormally affected by the dose he had ordered ; had he known earlier, he said, the steps taken might have been more effective The coroner expressed himself as not satisfied that a full and proper admission of the error had been made to the doctor The nurse had said that, having reported the matter to the night sister, she had done all that was required of her under ordinary hospital practice

Whether or no there was any absence of candour, incidents of this kind suggest that, at any rate in present war conditions when training is sometimes less thorough, there should be a revision of the relative responsibilities of hospital staffs or of the cryptic methods of labelling dangerous remedies

Artificial Limbs for Injured Workmen

Last week, in Redpath Brown & Co *v* Hayes the Court of Appeal gave a ruling which, so far as it goes may help the rehabilitation of victims of industrial accidents In effect the injured workman is not to be expected to provide for an artificial limb out of his own pocket , if the employers invite him to submit to amputation in order to lessen his incapacity and thereby to lessen their own liability to pay weekly compensation, they must furnish him with the necessary surgical appliance Hitherto there have been several sources from which help might come The man's approved society might provide the artificial limb if its funds xaminations of over 1000 cases, found that the discrepancies in the interpretations of the small and large ilms were certainly not above 1%

Three other factors must be set against mass radioscopy —the possible physical risk to the examiner from long exposure, the absence of any permanent record, and the inevitable reliance on the varying experience of the individual examiner By and large there can be no question that miniature screen photography is the most practical, reliable and economic single means of detecting macroscopic intrathoracic lesions in large groups of presumably healthy subjects, and while not wishing to minimise the value of mass radioscopy in the circumstances recorded by Dr Hall I cannot but feel that it is a "second-best" and there is a risk that, merely on grounds of expediency, the best may be prevented from becoming a practical proposition

The real problem given the necessary apparatus, is to avoid victimisation of the worker The Ministry of Labour, by including the tuberculous in the Government's scheme for the *training and resettlement* of disabled persons, has taken a step in the right direction On the other hand, the practical support and cooperation of the whole of organised labour is necessary for success As Dr H B Morgan, physician to the T U C, has more than once stated, while he is in sympathy with the social potentialities of the method, he will not support anything which may lead to victimisation of the worker In such circumstances a Government subsidy during the period of the patient's indisposition is an inevitable corollary to large-scale mass radiography and although undoubtedly costly should prove in the long run a fundamentally economic proposition

Our Navy and Air Force are now beginning to appreciate the practicability of miniature screen photography for the examination of recruits It is imperative that it should be extended to all the Services and to all young adolescents in war industry Only in this way will its extension to the general population in peace-time be assured, so that postwar planning will provide periodic health examinations in which the miniature screen photograph will be as readily available and equally important to the examining doctor as a specimen of urine

Wimpole Street, W 1 PHILIP ELLMAN

BARBITURATE POISONING

SIR,—Dr Fishman (*Lancet*, Feb 15, p 199) has reported that in a patient with barbiturate poisoning 3 2 c cm of 'Coramine' given intramuscularly and followed 15 min later by a further 2 c cm had little effect I should like to suggest that if coramine had been given in a larger dose intravenously instead of intramuscularly, the result would probably have been more satisfactory As Dr Mallinson (*Brit med J* 1940, i, 123) has pointed out in discussing the management of respiratory depression during anæsthesia, coramine can almost be guaranteed to make a patient depressed by a barbiturate wake up enough to require restraint to prevent him from falling off the operating-table It should however be given in sufficient dosage (5 c cm or more) and directly into the circulation

Harley Street, W 1 A W SPENCE

SUPERFLUOUS PREPOSITIONS

SIR,—I share Dr Lawrence's objection to unnecessary prepositions—particularly to "beat up" with its inevitable association with the kitchen rather than the rough house, "Try out" is however a phrase used by that master of the English tongue, Archbishop Cranmer, as long ago as 1542

London, W 1 W LANGDON-BROWN

SIR,—Aren't we all getting a little tired of these attempts to make English an unchangeable and therefore a dead language? Mr Herbert has been proselytising in *Punch* for many years, and now Dr Lawrence bursts forth (or does he just burst?) in your issue of Feb 14 Please let us have a more generous rather than a more limited definition of a superfluous preposition Prepositions, like adjectives, enrich meanings A classical illustration with the adjective is the old one of two tramps sitting by the side of the road, one of them reading a piece of newspaper 1st T See this? One man, one vote 2nd T What does that mean? 1st T One bloody man, one bloody vote 2nd T Ah! Well, why don't they say so? The preposition can be as effective an enricher of meaning as can the adjective You have defended your "try out" with the aid of the Concise Oxford Dictionary Mere common sense would have done as well I would submit also that there is a considerable difference in meaning between Dr Lawrence's examples, "check" and "check up," and "stand" and "stand for" After all, the written word is merely a method of recording thoughts, why should it not do the recording as accurately as possible? Before Dr Lawrence finally makes up his mind that the English language should be placed in a strait-jacket, may I recommend him to read some of the American shilling-shockers now flooding the book-shops He will there find, not some old-school-tie meiosis, but some beautiful (because accurately descriptive) language containing many prepositions and adjectives which few people other than himself would describe as superfluous

E R H SMITHARD

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS M P

IN ordinary times the announcement by Mr Arthur Greenwood of the transfer of the Ministry of Health's statutory duties in regard to town and county planning to Lord Reith, now to be known as the minister of works and planning, would be of first-class interest Up to the present Lord Reith's appointment has been an affirmation of good will but not of activity He has not had power to get money from the Treasury for essential planning work and his small advisory staff have had to fill their time with other work When Mr Greenwood read his long and complicated statement General Knox was unkind enough to ask "who wrote that essay?" But there will be a discussion later and the House will endeavour to pierce the defences of words and get through to the objective of action

* * *

Sir E Graham-Little courageously pursues his campaign for the national wheatmeal loaf and asked last week what was the effect of the buying up of bakeries by millers, and creating tied-houses for bread Major Lloyd George had "no information"

* * *

A deputation of members of all parties was received by Mr Attlee to discuss the investigation of complaints about conditions in the women's services The Government seemed surprised that the House should consider it desirable to have women on an investigating committee, but it is hoped that they will relent and that the chairman of the committee will be a woman

General conditions in the women's services are good but there are some black spots, some due to conscription which has brought in large numbers of women from all classes and occupations It appears, for instance, that one volunteer woman is better than two "pressed" women even in health

FROM THE PRESS GALLERY

Children in the Potteries

THE pottery industry—scheduled as a dangerous trade on account of both silicosis and lead poisoning—employs children under 16 as runners for the moulders It is a blind-alley job, consisting of carrying the wet clay to the stoves, which the children must enter, and returning with the dried articles

On Dec 23 the Government issued a general emergency order extending the hours of employment of these young people from forty-seven to fifty-three per week, and Lord GAINFORD had much support when on Feb 10 in the House of Lords he asked that the Government should give an undertaking that there should be no such increase To impose such hours on children in a non-vital industry seemed to him absolutely unjustifiable, and he reminded the House that Lord Moyne had admitted that the medical inspectors of the Home Office had not been consulted with regard to the extension, and it was left to the employers and employed to see whether signs of undue fatigue appear This was a departure by going out into the cold, and a fasting blood sugar estimation was found to be 0 049 mg per 100 c cm

Among points of interest arising out of this case is the combination of glycosuria and hypoglycæmia Are his hypoglycæmic attacks connected with the leak of sugar through the kidney? Is this, in fact, a case of renal glycosuria combined with hypoglycæmia? Has the blast injury any connexion with his symptoms? There was no history of glycosuria before the dates given, and his urine on enlistment in January, 1939, and on his first admission into hospital was recorded as being normal His attacks did not begin until about 6 weeks after the exposure to blast. There seems to be little justification for postulating an underlying adenoma of the pancreas, glycosuria has not been described in such cases as far as I can discover In any case the decrease of symptoms and comparative good health would hardly justify laparotomy The possibility of blast injury to the pituitary region was considered

I wish to thank Dr Perry for his coöperation in this case

J RUBIE,
Medical Officer, R A F V R
London, N W 2

POSTURE DURING SLEEP

SIR—Dr Rigden suggests that Bjorkman discovered that the lung on which one lies gets more air than the lung on the upper side of the body and adds that Jacobaeus has set out Bjorkman's results in 1936 I had already noted this fact in your columns in 1919 In an article (*Lancet*, 1919, i, 697) I stated

Great assistance in making a collapsed lung function properly is rendered by bending the body away from the injured side, as the patient lies on his back This position causes a partial collapse of the sound lung by mechanical pressure of the ribs Also, when possible, the patient should lie on the injured side when preparing for sleep

In a letter (*Ibid*, 1926, i, 834) I wrote later

I have often been questioned about this advice, doubt being cast on the idea that it is the lung on the side on which the patient is lying that is getting more air than the opposite lung From careful observation I believe that this is really so The side on which the patient lies sinks into the bed in a convex position and apparently the lung functions freely, the opposite or upper side is mechanically compressed by the position assumed, and expansion is restricted I therefore always advise patients with an empyema to lie on the back, as described, or on the side where the rib has been resected, both from a drainage point of view and for expansion of the lung

I gained my experience in the last war working in 15 hospitals

Wimpole Street, W 1 CORTLANDT MACMAHON

WAR-TIME NURSERIES

SIR,—I cannot agree with Dr Gilchrist and Dr Menzies that "a day nursery, unless well staffed, is a menace" (*Lancet*, Feb 7, p 185) The children's own homes have been tried and found wanting For thirty years we have been sending into them various kinds of domiciliary visitors to try and educate the ineducable, to make their homes safe for the children of democracy Administrators in sociology admit, if they are honest, that these visits have been a failure and would prefer even an inadequately staffed war-time nursery to the average home as a means of rearing and nurturing the child of tender years In Cardiff, the city council leapt at the opportunity of providing war-time nurseries as a help in the war effort, yes, but even more as the thin end of the wedge towards permanent addition to the city's nursery school establishment It already had a model nursery school and now has opened three war-time nurseries, with the hope of two more I do not know whether your correspondents would regard our staffing as adequate We have as peripatetic supervisor of all three an able woman, an ex-teacher, assisted by an equally peripatetic and equally able ex-health visitor In addition to these two supervisory posts, the following staff is paid at each of the nurseries a teacher in charge, a trained nursery nurse, probationers, usually girls between 16 and 18 years of age, who propose to take up nursing or teaching, and a cook

This nucleus of paid staff is supplemented by a voluntary staff of women interested in the welfare of children, at each of the nurseries we shall be having at least four such helpers No staffing difficulties are likely to occur, as we are flooded with applicants wishing to give voluntary help

It is a joy to see the change to the good in the children brought to these nurseries even in the few short weeks since they opened If there remains in their parents one tiny fragment of receptivity, it is likely to be stimulated most successfully not by being talked at, but by what they see at the nursery schools or war-time nurseries. It would be interesting to learn how many young Russian soldiers now fighting so fervently for their soil were reared in the equivalent of our war-time nurseries and whether your correspondents would think that the staffing of these was adequate

J GREENWOOD WILSON
Public Health Department, Cardiff

SULPHONAMIDES AND ENTERIC FEVERS

SIR,—In contrast to Dr Muller's case (*Lancet*, Jan 24, p 104) of paratyphoid B which responded well to sulphapyridine, I offer brief details of a case in which the drug, also given before the diagnosis was clear, had no effect on the temperature and a bad effect on the patient's general condition

The illness began when the patient—a boy of 4, subject to eczema, asthma and prurigo—was in bed for a supposed attack of asthma Large quantities of mucus were passed with, some normal stools, temperature gradually rose to 103° F by the end of the first week On the 6th day the left ear ached and there was some redness of the drum and neck stiffness Sulphapyridine given, 4 5 g in 2½ days, ear signs passed off in 48 hours During second week temperature swung between 98 4° F and 103° F On 8th day he had intense rectal pain, and passed blood and thin pus Pus passed involuntarily for the next few days, one normal stool Thereafter, watery motions with flecks of mucus and fæces mixed On 11th day, white cells were 15,600 with neutrophils 64% Sulphapyridine, 3 g daily, begun again, caused vomiting and restlessness, and hampered the diagnosis of an erythematous rash appearing on 13th day On 14th day, white cells 12,400 On 15th day report on stools came through 7th day specimen, red cells +, pus cells +, mucus ++, no pathogenic organisms found, 11th day specimen, no red cells or pus, *Bacterium paratyphosum B* isolated Widal, 15th day *Bact typhosum* and *Bact paratyphosum A* no agglutination, *Bact paratyphosum B*, agglutination at 1 in 2250 Sulphapyridine stopped the same day, and temperature became steady at 101° F Patient lapsed into typhoid state, has vomited intermittently since

In view of the deterioration in this patient's condition, which became critical during the second course of sulphapyridine, it seems inadvisable to give the drug to typhoid patients on the off chance that it will do good—at least under uncontrolled conditions from which no useful conclusions can be drawn

BARON RUSSELL
Friar Gate Derby

MASS RADIOSCOPY IN FACTORIES

SIR,—Dr Stephen Hall is to be congratulated on his survey of two factories, and one can appreciate that in the circumstances outlined by him mass radioscopy was the method of choice The question arises whether its degree of accuracy and practicability compare favourably with those of other available methods From my experience there is little doubt that it is an inexpensive means of detecting macroscopic lung lesions But if we compare its accuracy with that obtained by mass radiography we must place it in the category of second best Fellows and Ordway (*Trans nat Tuberc Ass N Y* 1937 33, 51), in a study of mass radioscopy in the examination of policy holders of the Metropolitan Life Assurance Company of America, compared their results with full sized control films and found that in 2603 examinations 87% of pulmonary lesions were detected In an analogous investigation of 3229 cases I have found that 94% of the interpretations coincided with those of the large film (*Proc R Soc Med* 1941, 34, 595) In either study the value of the method is not disputed but its degree of error cannot be disregarded In technically satisfactory miniature screen photography, however, Clark, Cordiner and I (*Brit J Radiol* 1941, 14, 54, 186) and Clark, Courtenay Gage and Poulssen (*Ibid*, p 250), in examinations of over 1000 cases, found that the discrepancies in the interpretations of the small and large films were certainly not above 1%

Three other factors must be set against mass radioscopy —the possible physical risk to the examiner from long exposure, the absence of any permanent record, and the inevitable reliance on the varying experience of the individual examiner By and large there can be no question that miniature screen photography is the most practical reliable and economic single means of detecting macroscopic intrathoracic lesions in large groups of presumably healthy subjects, and while not wishing to minimise the value of mass radioscopy in the circumstances recorded by Dr Hall I cannot but feel that it is a "second-best" and there is a risk that, merely on grounds of expediency, the best may be prevented from becoming a practical proposition

The real problem given the necessary apparatus, is to avoid victimisation of the worker The Ministry of Labour, by including the tuberculous in the Government's scheme for the training and resettlement of disabled persons, has taken a step in the right direction On the other hand, the practical support and cooperation of the whole of organised labour is necessary for success As Dr H B Morgan, physician to the T U C , has more than once stated, while he is in sympathy with the social potentialities of the method, he will not support anything which may lead to victimisation of the worker In such circumstances a Government subsidy during the period of the patient's indisposition is an inevitable corollary to large-scale mass radiography and although undoubtedly costly should prove in the long run a fundamentally economic proposition

Our Navy and Air Force are now beginning to appreciate the practicability of miniature screen photography for the examination of recruits It is imperative that it should be extended to all the Services and to all young adolescents in war industry Only in this way will its extension to the general population in peace-time be assured, so that postwar planning will provide periodic health examinations in which the miniature screen photograph will be as readily available and equally important to the examining doctor as a specimen of urine

Wimpole Street, W 1 **PHILIP ELLMAN**

BARBITURATE POISONING

SIR,—Dr Fishman (*Lancet*, Feb 15 p 199) has reported that in a patient with barbiturate poisoning 3 2 c cm of 'Coramine' given intramuscularly and followed 15 min later by a further 2 c cm had little effect I should like to suggest that if coramine had been given in a larger dose intravenously instead of intramuscularly the result would probably have been more satisfactory As Dr Mallinson (*Brit med J* 1940 i, 123) has pointed out in discussing the management of respiratory depression during anæsthesia, coramine can almost be guaranteed to make a patient depressed by a barbiturate wake up enough to require restraint to prevent him from falling off the operating-table It should however be given in sufficient dosage (5 c cm or more) and directly into the circulation

Harley Street, W 1 **A W SPENCE**

SUPERFLUOUS PREPOSITIONS

SIR,—I share Dr Lawrence's objection to unnecessary prepositions—particularly to "beat up" with its inevitable association with the kitchen rather than the rough house, "Try out" is however a phrase used by that master of the English tongue, Archbishop Cranmer, as long ago as 1542

London W 1 **W LANGDON-BROWN**

SIR,—Aren't we all getting a little tired of these attempts to make English an unchangeable and therefore a dead language ? Mr Herbert has been proselytising in *Punch* for many years, and now Dr Lawrence bursts forth (or does he just burst ?) in your issue of Feb 14 Please let us have a more generous rather than a more limited definition of a superfluous preposition Prepositions, like adjectives, enrich meanings A classical illustration with the adjective is the old one of two tramps sitting by the side of the road one of them reading a piece of newspaper 1st T See this? One man, one vote 2nd T What does that mean ? 1st T One bloody man, one bloody vote 2nd T Ah ! Well why don't they say so ? The preposition can be as effective an enricher of meaning as can the adjective You have defended your "try out" with the aid of the Concise Oxford Dictionary Mere common sense would have done as well I would submit also that there is a considerable difference in meaning between Dr Lawrence's examples, "check" and "check up,' and "stand" and "stand for" After all the written word is merely a method of recording thoughts , why should it not do the recording as accurately as possible ? Before Dr Lawrence finally makes up his mind that the English language should be placed in a strait-jacket, may I recommend him to read some of the American shilling-shockers now flooding the book-shops He will there find, not some old-school-tie meiosis, but some beautiful (because accurately descriptive) language containing many prepositions and adjectives which few people other than himself would describe as superfluous

E R H SMITHARD

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS M P

IN ordinary times the announcement by Mr Arthur Greenwood of the transfer of the Ministry of Health's statutory duties in regard to town and county planning to Lord Reith, now to be known as the minister of works and planning, would be of first-class interest Up to the present Lord Reith's appointment has been an affirmation of good will but not of activity He has not had power to get money from the Treasury for essential planning work and his small advisory staff have had to fill their time with other work When Mr Greenwood read his long and complicated statement General Knox was unkind enough to ask "who wrote that essay ?" But there will be a discussion later and the House will endeavour to pierce the defences of words and get through to the objective of action

* * *

Sir E Graham-Little courageously pursues his campaign for the national wheatmeal loaf and asked last week what was the effect of the buying up of bakeries by millers, and creating tied-houses for bread Major Lloyd George had "no information"

* * *

A deputation of members of all parties was received by Mr Attlee to discuss the investigation of complaints about conditions in the women's services The Government seemed surprised that the House should consider it desirable to have women on an investigating committee, but it is hoped that they will relent and that the chairman of the committee will be a woman

General conditions in the women's services are good but there are some black spots, some due to conscription which has brought in large numbers of women from all classes and occupations It appears for instance, that one volunteer woman is better than two "pressed" women even in health

FROM THE PRESS GALLERY

Children in the Potteries

THE *pottery industry*—scheduled as a dangerous trade on account of both silicosis and lead poisoning—employs children under 16 as runners for the moulders It is a blind-alley job, consisting of carrying the wet clay to the stoves, which the children must enter, and returning with the dried articles

On Dec 23 the Government issued a general emergency order extending the hours of employment of these young people from forty-seven to fifty-three per week, and Lord GAINFORD had much support when on Feb 10 in the House of Lords he asked that the Government should give an undertaking that there should be no such increase To impose such hours on children in a non-vital industry seemed to him absolutely unjustifiable, and he reminded the House that Lord Moyne had admitted that the medical inspectors of the Home Office had not been consulted with regard to the extension, and it was left to the employers and employed to see whether signs of undue fatigue appear This was a departure from the system that has grown up, which detracted from the authority of the factory inspectors, and gave no adequate safeguard to the children He submitted that it was a cruel, retrograde and almost inhuman step which had not been found necessary in any vital industry in the country Lord Listowel said that during a war there is always a danger that the strength of children and adolescents may be overtaxed and the last report of the Chief Inspector of Factories had laid stress on the alarming increase in the number of industrial accidents involving young people—18% increase among boys and 11% among girls as compared with the preceding year He asked that the Industrial Health Research Board should inquire into the working-hours of adolescent, as well as adults Lord Wedgwood said that the real difficulty was that the trade union had not stood by the children, but he was glad to say the firm of Wedgwood did not propose to use this change in the rules or to increase the hours of work Lord Snell, while replying for the Government, found himself in personal agreement with much that had been said No-one welcomed the employment of young people for periods beyond their strength but we were in a time of crisis when all of us had to work harder and longer He offered the rather cold comfort that at least things were better than they were when children worked for 65 to 70 hours a week Conditions in the pottery industry were exceptional, and the Minister of Labour had satisfied himself that it would be difficult for the industry if the 48 hours maximum was retained The Government did not say that the order was desirable or even unobjectionable, but the Potteries had a heavy demand for munition workers and it was on the ground of acute need that the Government regretted they were unable to accept Lord Gainford's proposal

Lord Samuel said that it was not lack of cogency in Lord Snell's speech which made his case unconvincing, but he had put forward no valid reason why this industry alone should ask the Government for an order of this kind Lord Gainford said that though he believed in time of war the Upper House had never had a division he was reluctant to withdraw his motion, but he amended it to a gentle disapproval of the order Lord Wolmer thought it a very strong measure to pass even this resolution, and Lord Donoughmore pointed out that even if carried it would not abolish the operation of the order Lord Moyne, quite rightly, considered that even in this form the resolution would lead to the inference that the order was not justified and would be a vote of censure on the Government But Lord Addison sensibly urged that surely they need not censure the whole Government because they did not want young people to work such long hours If they accepted that doctrine they could not express an opinion on anything if it happened to be contrary to what a Government department had done They did not want to defeat the Government, but to express their views on a human problem On division the motion was lost by 17 to 20

QUESTION TIME

The National Loaf

Sir E Graham Little asked the Parliamentary Secretary to the Ministry of Food whether he is aware that the practice by which millers buy up bakeries when they come upon the market and rent them to bakers who undertake to buy all their flour from that miller, militates against the adoption of the national wheatmeal loaf which local bakers are progressively unwilling or unable to supply on demand, and whether he will inquire into this matter ?—Major G Lloyd George replied I have no information to support the view that the control of some bakeries by some millers has checked the production and sale of national wheatmeal bread

Answering a further question Major Lloyd George said Under the terms of the Bread (Control and Maximum Prices) Order, 1941, it is an offence to describe as national wheatmeal bread bread in the making of which ingredients other than national wheatmeal, oil or fat, water, salt, yeast, or improvers in the nature of yeast food, have been used The policing of this order is carried out by the enforcement officers of the Ministry, but no prosecutions have been necessary since the order came into force in October last No other instructions to bakers about the manufacture of national wheatmeal loaves have been given There are some 27,000 licensed bread bakers in the United Kingdom, and to attempt to standardise their baking methods would be neither desirable nor practicable One test of some hundreds of samples, directed primarily to ascertaining the quality of the national wheatmeal flour then in distribution, was carried out in the summer of 1941, but it has not been thought necessary to repeat this survey as more effective checks upon the quality of flour being manufactured have since been devised

Advisers on Bread

Major Lloyd George informed Sir E Graham Little that Prof J C Drummond, D Sc, scientific adviser, and Mr T Moran, D Sc, deputy scientific adviser, have advised the Minister of Food in regard to the fortification of white flour and the specification of wheatmeal The Minister had also consulted Lord Horder, his personal adviser on medical aspects of food problems Professor Drummond was appointed on Feb 1, 1940, Dr Moran on June 24, 1940, and Lord Horder on July 7, 1941 The advice given by officers of a Government department to their minister is confidential and is not published There is a close contact between the Ministry and the Medical Research Council, the secretary of which is one of the members of the Scientific Food Committee appointed by the Lord Privy Seal in July, 1940, to advise upon problems of national food requirements

Medical Staffs in Royal Ordnance Factories

Responsibility for the appointment of medical staffs employed at Royal Ordnance factories rests with the Ministry of Supply Vacancies are advertised and candidates are also nominated by the local war emergency committee of the British Medical Association In making selections the Ministry is advised where necessary by Ministry of Labour inspectors of factories and by independent medical practitioners (Sir Andrew Duncan replying to Mr F Messer)

Industrial Diseases among Miners

Mr David Grenfell, replying to Mr J Griffiths, said The Workmen's Compensation statistics show for the coal mining industry a decrease in the cases of nystagmus, beat hand and affections of the wrist and tendon sheath, and an increase in the cases of silicosis, beat knee, beat elbow and dermatitis As regards dermatitis special inquiries are being made to find out why the certificates of disablement for this disease, which ten years previously were very few, reached a figure of 400 in 1940 —Mr Griffiths If inquiries show that the increase in dermatitis is one to deficiency in diet will the necessary steps to deal with it be taken ?—Mr Grenfell Certainly

Medical Inspection of Mines

Mr F Messer asked Mr Grenfell if, in view of the greatly increased demand for tin and the possibility of tin mines in this country being reopened, he was satisfied that the one medical inspector in the mines department now responsible for nearly 1,000,000 workers in mines and quarries was sufficient medical staff —Mr Grenfell referred him to the reply given on Feb 3 (*Lancet*, Feb 14, p 212)—Mr Messer Notwithstanding that answer, is the Minister aware that silicosis is much more prevalent among tin miners than coal-miners, and has he read the annual report for 1938 which shows that out of 1500 workers 20 died of silicosis, and does not that call for some action ?—Mr Grenfell It is well known that silicosis is prevalent in Cornish tin mines, and certain preventive precautions were laid down by regulations to protect the workers against the incidence of this disease I do not think that the men in Cornwall are lacking attention for want of medical knowledge on the subject —Mr Messer Is Mr Grenfell satisfied that he has a sufficient inspectorate ?—Mr Grenfell I think it is sufficient for this purpose but the House knows that a very extensive investigation has been going on under the Research Board The Lord President of the Council is in charge of it, and I am expecting a very comprehensive report from that body within a few weeks

Classification of Recruits in 40-50 Age-group

In answer to a question the Minister of Labour said Such men are not at present being called up, and when they are, they will be posted only to static and sedentary duties The existing classification is made on medical grounds, and while I think it unlikely, that any modification need be made in the present medical code in order to enable men over 40 to be properly posted, I am in touch with my medical advisory committee on the whole subject

Sir Francis Fremantle Does not X ray examination of recruits eliminate people who are unfit for service but are not rdinarily discovered as such by the recruiting boards ?—r E Bevin I have been pursuing that subject, but it is eally a question of equipment —Sir F Fremantle Is it not he case that equipment is now coming forward in considerable uantity and can be supplied ?—Mr Griffiths Will the inister in consulting with his medical officers bear in mind hat a fairly large percentage of recruits are unfit because of ndustrial diseases or industrial accidents ?—Mr Bevin The present medical examination reveals a lot of what might e called preventable illness, that is illness which might be prevented by slight changes in the design of machinery and he form of occupations

Efficiency of Medical Boards

Mr G C Touche asked the Minister of Labour in how many cases any action had been taken in regard to members of medical boards who had made serious mistakes in passing unfit men as grade I for the services —Mr Bevin replied The decision as to grading is taken by the medical board and not by an individual doctor There have, however, been eight cases in which the appointments of chairman and members of medical boards were terminated on account of unsuitability or inefficiency in some other cases in which appointments were not continued relative inefficiency or unsuitability was one of the reasons, but I could not give any precise figures under this head I should add that the medical advisory committee, under the chairmanship of Lord Horder, which assists the department in making the arrangements for medical examination have given it as their opinion that the proportion of men who are passed by the boards as fit for service, and found later to be unfit, is small

Mr Rhys Davies asked the Secretary of State for War whether he had considered the number of members of the Army who had been discharged on medical grounds, in comparison with the number passed fit for service by the medical boards, and whether he was satisfied that those boards were functioning properly —Sir Edward Grigg, undersecretary for war, replied In most cases where men have been discharged from the Army on medical grounds within a short time of enlistment it has been found that the effect of a disability noted and recorded by the medical board has been more severe under service conditions than was expected There are other men who with the same or an even greater disability stand up perfectly well to service conditions and may subsequently be raised to a higher grade I am not aware of any evidence to show that these boards are not in general functioning properly

Service Men and Amputations

The normal procedure when a man has suffered amputation during service in the Armed Forces is to discharge him from hospital when his stump is soundly healed unless the special surgical needs of the case make this course undesirable A short interval must elapse between the healing of the stump and the fitting of an artificial limb to enable the stump to settle down, and medical opinion is that generally it is better that during this *period the man should not be in hospital* The man who has left hospital is kept under observation at a limb fitting centre of my ministry, and, in due course, is fitted with an artificial limb Instructions will shortly be issued by the service departments which will ensure that any man who has suffered an amputation in service shall be retained in the Service and on Service pay and allowances until at least 28 days after he has been satisfactorily fitted with an artificial limb (Sir Walter Womersley replying to Sir Joseph Nall.)

Recruitment of Home Guard

Mr Rhys Davies asked the Secretary of State for War whether any steps are taken to prevent mental deficients and other categories exempt from the Armed Forces from joining and retaining their connexion with the Home Guard —Sir E Grigg replied Volunteers for the Home Guard are registered at the local police station in the first instance and, if they are considered suitable for enrolment, they are interviewed by the unit commander Home Guards can, of course be of a lower medical standard than regular soldiers and I think that commanding officers can be relied upon to accept only such men as are fit to perform Home Guard duties —Mr Davies Is the Minister aware that no method is in existence up to the present for finding out whether certain persons are mentally deficient or not, and is he aware that practically all the mentally deficients are properly registered and that a scheme should be evolved whereby officers of the Home Guard could be put in touch with those registers ?—Sir E

obtained

Hospital Waiting-lists

Mr James Hollins asked the Minister of Health whether his attention had been drawn to the long waiting-lists of voluntary hospitals and their unwillingness to transfer patients to emergency hospitals in the district in order that they might get treatment, if he was prepared to recommend that the emergency hospitals be made available for people desiring treatment —Mr E Brown replied Where hospitals have been found to have unduly large waiting-lists their attention has been drawn to the facilities which exist for transferring patients to other hospitals under the Emergency Hospital Scheme

Vacancies in Approved Schools

Mr Edmund Harvey asked the Secretary of State for the Home Department whether he can give the latest figures of the numbers of children awaiting accommodation in approved schools, whether numbers of boys are still detained in prison owing to the shortage of remand homes, and what progress has been made in the provision of additional remand homes and additional approved schools —Mr Herbert Morrison replied At the end of last year about 1300 boys and girls under 17 were awaiting vacancies in approved schools, but it must be remembered that it usually takes time to find for each case the appropriate school and there must, therefore, always be a substantial number waiting while arrangements are made for their reception into schools The number waiting in prison was less than 20 No child under 14 can be detained in prison, and young persons between 14 and 17 cannot be so detained unless the court gives a certificate of unruliness or depravity During the year nearly 600 additional places were provided in approved schools and about 450 in remand homes Further plans are on foot, and although in war conditions the difficulties of finding premises and getting necessary work done are very great, it is hoped that a number of additional approved schools and remand homes may be opened during the next few months —Mr Harvey Would it be possible to lease premises or urge authorities to do so instead of merely acquiring by purchase ?—Mr Morrison I do not think that would be excluded from consideration.—Mr Kenneth Lindsay Have they power to requisition ?—Mr Morrison I am not sure —Mr W J Thorne Can anything be done to help local authorities to obtain more premises ?—Mr Morrison We give them all the help we can in that direction

Exemption of Women Doctors

Captain G S Elliston asked the Minister of Labour whether he would amend the Employment of Women (Control *of Engagements) Order, 1942,* made under the Defence Regulations 58A, to secure for doctors and dentists the exemption allowed to nurses, teachers, &c, and thus avoid unnecessary disturbance of the established customs of the medical profession in regard to vacant appointments, and the satisfactory arrangements now in operation by the Central Medical War Committee —Mr Bevin replied I am in consultation with the Minister of Health on this matter

---

Infectious Disease in England and Wales

WEEK ENDED FEB 7

Notifications —The following cases of infectious disease were notified during the week smallpox, 0 scarlet fever, 1113, whooping-cough, 1251, diphtheria, 920, paratyphoid, 9, typhoid, 11, measles (excluding rubella), 1611, pneumonia (primary or influenzal), 1366, puerperal pyrexia, 178, cerebrospinal fever, 181, poliomyelitis, 7, polio-encephalitis, 1, encephalitis lethargica, 6, dysentery, 115, ophthalmia neonatorum, 83 No case of cholera, plague or typhus fever was notified during the week

The number of civilian and service sick in the Infectious Hospitals of the London County Council on Feb 4 was 1319, including scarlet fever 125 diptheria 219 measles 50, whooping-cough, 524 enteritis 51 chicken pox, 44 erysipelas, 20 mumps 29 poliomyelitis 1, dysentery, 50, cerebrospinal fever, 24 puerperal sepsis 16 enteric fevers 5, german measles, 4, other diseases (non infectious) 68, not yet diagnosed, 89

Deaths —In 126 great towns there were no deaths from *enteric fevers*, scarlet fever or measles 7 (2) from whooping-cough 29 (2) from diphtheria, 42 (6) from diarrhœa and enteritis under 2 years, and 84 (15) from influenza The figures in parentheses are those for *London* itself

Deaths from influenza were scattered over forty seven great towns, Manchester reporting 4 There were 3 fatal cases of diphtheria at Liverpool

The number of stillbirths notified during the week was 212 (corresponding to a rate of 38 per thousand total births), including 21 in London

Obituary

HERBERT LIGHTSTONE

D S O , M C , M D MCGILL

Dr Herbert Lightstone, who died on Feb 12 in his 64th year, was born in Canada In 1898 he served in the Spanish American War with the American Red Cross in Cuba, and from 1899 to 1901 with the Canadian Field Artillery in the South African War He qualified from Bishop's College Montreal in 1901 and took his M D from McGill University nine years later He held the posts of medical superintendent of the Women's Hospital Montreal, and demonstrator of anatomy at Bishop's College before coming to this country where he interested himself in ear and throat work, holding a registrarship at the London Throat Hospital In the Great War he served as medical officer, to the headquarters of the 4th Army, received the D S O and M C , and was six times mentioned in dispatches In 1919 he joined the medical staff of the Ministry of Pensions, serving first as H Q inspector He was promoted director of medical services in 1932 and deputy director-general a year later When Sir John Hebb, whose death we record on another page, was seconded to the E M S in 1938 Dr Lightstone took his place as D G M S of the Ministry of Pensions Of his work there his colleague, A S writes —

"Herbert Lightstone had personality His well-groomed, military figure, fine head keen eyes, shrewd mouth, and quick forceful speech demanded attention And he expected attention , he had served in three wars, he knew the world of men and was conscious of his powers He saw where he was *going and how he meant* to get there Yet blended with this vigorous independence, there was a need for companionship and support He delighted in giving parties and was stimulated by an audience He wanted his staff around him while he talked, discussed, directed and 'phoned with bewildering speed and in surprising sequence Those who saw him *at work learned to admire the clarity and subtlety of his* mind, his foresight, and the rapid way he dug down to the roots of a problem He had his moods of sheer impetuosity, especially if his audience was large but when one saw him later alone, he would agree to reconsider His conduct of an interview was superb He knew his man, and by voice, manner and phrase got just the atmosphere and usually the result he wanted Lightstone was a man of wide sympathy generously responsive to a call on his emotions and would go all out to help a friend or colleague in distress With his staff he was direct, honest, and careful of their interests You knew where you were with him , if 'Lighty' did not approve he said so with emphasis and at once and where he gave his trust he gave *it in full measure* These qualities made him a memorable D G "

Dr Lightstone married in 1912, Doris Eva Joseph, who died in 1927 They had two daughters, who survive him

KATHLEEN WILSON

M B LEEDS

Kathleen Wilson was always anxious to have a career at a time when this was unusual for a girl, but her home life predisposed her to an interest in affairs She was the second daughter of Mr Richard Wilson, a noted art collector, and she left the Leeds Girls High School early and travelled in the United States and Italy For ten years she tried to escape from an unsatisfying social life She did secretarial work at the Yorkshire Ladies Council of Education, worked in a bank and at real estate in Canada, and qualified as a sanitary inspector in Leeds About 1914 she took her C M B and this qualification enabled her to go with the Friends maternity unit to France soon after the outbreak of war In 1916 she came home to work for matriculation and read medicine at Leeds where she graduated in 1921 She held several house-appointments at the General Infirmary before she began her seventeen years of general practice in the city, combined with part-time work at maternity and child-welfare centres under the corporation In 1933 she also undertook the medical care of the women staff at Messrs Lewis's, while as honorary medical officer to St Christopher's Home for Infants and the Leeds Convalescent Society she gave unsparingly of her time and advice For some years she had been anæsthetist to the Infirmary and the Dental School and Hospital. At the beginning of this war she became *anæsthetist to one of the emergency* hospitals and to a first-aid post, and regularly served on one of the medical boards for women recruits She accompanied a party of children to Canada, and was on board ship with a second party bound for Australia when the evacuation scheme was stopped

Dr Wilson's varied activities and interests give a clue *to her personality—all she did was leading up to medicine* She was an excellent dancer and swimmer, a lover of music, and a good tennis-player Her holidays were spent abroad or in the Yorkshire dales She was one of the first soroptimists in Leeds and a keen supporter of the Federation of University Women and of the Medical Women's Federation In personality as in physique she was built on *magnificent lines honest and courageous*, big and beautifully proportioned, with charm of voice and carriage, she was a joy to see or hear Perhaps she was at her best in her beautiful and comfortable home, for she was the soul of hospitality and always ready to help a friend She was not as strong as she looked, but she seemed to be in good form and happier than ever in her work when she developed septicæmia and died on Jan 26 after five days' illness. Many are proud of her friendship and grateful for knowing her

HUMPHREY DOUGLAS GARDNER

M B CAMB

Dr Humphrey Gardner, who died at Byfleet on Jan 17, after a short illness, at the *age of 49, had more than* a hint of the Napoleonic about him *both in appearance* and character He always had a great zest for life though his father's early death had thrust heavy responsibilities on him while he was still an undergraduate at Trinity College, Cambridge In 1916 Gardner qualified from University College Hospital where he held house-appointments, and he served *as a major in* the last war Before starting in practice at Cooden near Bexhill on-Sea Gardner held resident appointments at Addenbrooke's and at the East London Hospital for Children At Cooden and later when he moved to Woking he always took particular interest in his work for infants and children Last summer he had a serious illness which probably opened the way to his early death from pneumonia He leaves his widow with one daughter

---

Frank Sproston Leicester

Captain ROBERT KELLOCK, R A M C , who died of wounds in the Middle East on Dec 31, at the age of 28, was the only son of Mr Hugh Kellock of Leicester He graduated from the University of Glasgow in 1937, and held the posts of house-surgeon and resident surgical officer at North Ormesby Hospital, Middlesbrough General practice attracted him and he joined a firm at Loughborough, his patients and his friends will recall his happy personality He joined the R A M C in February, 1940

Flight-Lieutenant LEO MALCOLM MAGURK, M R C S, was killed by enemy action at the end of last year He was born in 1915 and went up to the Middlesex Hospital in 1933 His teachers remember him as a hard worker, and his contemporaries as an able business manager of the hospital journal and a creditable squash player He qualified in 1939 and after holding several short hospital appointments he joined the R A F V R the following year In 1941 he was posted to the Far East command His home was at Ipswich

Medical News

niversity of Cambridge

The Raymond Horton Smith Prize for 1940–41 has been arded to Dr J O Poynton, for his essay on the tuber losis problem and endemic filariasis in the Federated Malay ates

yal College of Surgeons of England

At a meeting of the council held on Feb 12, with Sir Alfred ebb Johnson, the president, in the chair, the following ere re-elected members of the court of examiners Mr E K artin, Prof A W Sheen, Mr. W H Bowen, Mr John Morley d Mr P J Moir Prof Harry Platt was appointed Robert nes lecturer for 1942 Surgeon Rear-Admiral C P G akeley was appointed representative of the College on the eneral Medical Council, and Sir Robert Kelly was appointed representative on the court of the University f Liverpool

A diploma of fellowship was granted to J R Belcher and A F Rushforth

Diplomas of membership were granted to R M Archer, D Brawn and P R C Evans and to the candidates named the report of the comitia of the Royal College of Phy cians in our issue of Feb 7 (p 187) Diplomas in public ealth and medical radiology were also granted, jointly with e Royal College of Physicians, to the candidates names in e same report

Surgeon Rear Admiral G Gordon Taylor will deliver a radshaw lecture to the college on Thursday, Feb 26, at 30 P M He will speak on abdominal injuries of modern arfare The Hunterian lecture which he was to have given n that day has been cancelled

At the Buckston Browne lunch of the College on Feb 12 r Alfred Webb Johnson for the first time welcomed women ellows and members—led by the Princess Royal—as guests ther guests included Professor Stomski, Polish minister of nformation, representing his president, and Prof A T urasz, who had just been admitted to the honorary fellow hip of the college Speaking of the loss of much of the unterian collection, Sir Alfred reminded his listeners that planning for the future they must reconcile progress and radition, and assess what parts of the collection had become an istoric monument and what parts remained essential tepping stones' Hunter's fame rested on his consistent nd expert use of the experimental method in the study of ving processes The college was well equipped for experi ental work at the Bernhard Baron laboratories and the uckston Browne research farm Both of these institutions ad handsome endowments, but to make sure of their continued usefulness endowments must also be obtained for rofessorships of human and comparative anatomy and of uman and comparative pathology, for the financial resources f the college must be largely pledged to restore the museum he president with Webb Johnsonian turn of phrase remarked hat in these times of general restriction the company might ot be able to leave the table echoing Luther's remark fter the diet of Worms—“I could take no other course”—nd proposed the toast

Here's a health and drink it down
To our oldest classmate—Buckston Browne

edical Society of London

A meeting of this society will be held at 11, Chandos Street, ondon, W 1, on Monday, Feb 23, at 4 30 P M, when Mr E Griffiths, Colonel F D Howitt and Dr D C Norris ill open a discussion on rehabilitation

adiotherapeutic Research Unit

The radiotherapeutic research unit of the Medical Research ouncil, formerly known as radium beam therapy research, as resumed clinical work in new quarters provided by the ondon County Council at Hammersmith Hospital For the resent this work will be confined to the treatment by radium eam therapy or X rays of cases of carcinoma affecting the uccal cavity, tongue, pharynx and larynx Dr Constance ood, the director, would be glad to have suitable cases eferred to her these should be patients who have had no revious treatment, either surgical or radiological, and referably not in an advanced stage of the disease The hysical work under the charge of Mr L G Grimmett, which as meanwhile been continued in temporary quarters at the mperial College of Science and Technology has also been ransferred to Hammersmith Hospital

Nutrition Society

The meeting of this society arranged for Feb 28 will be held at the London School of Hygiene, Keppel Street W C 1 and not in Cambridge as announced in our last issue Further information about the society can be obtained from the hon secretary Mr L J Harris, D Sc, Dunn Nutritional Laboratory, Milton Road, Cambridge

Ex-Service Welfare Society

A conference will be held by this society at the Royal College of Physicians of Edinburgh on Friday, March 6, at 10 A M, when there will be a discussion on the after care of neurotic war casualties Further information may be had from Major C E Thwaites, M R C S, Milner House, Ermyn Way Leatherhead

Royal Society of Medicine

A meeting of the section of odontology of this society will be held on Monday, Feb 23, at 2 30 P M, when Dr H T Roper Hall, L D S, will read a paper on the pathological absorption of the teeth The section of urology will meet on Feb 26, at 4 30 P M, when Mr William Graham will speak on phenothiazine as a urinary antiseptic and Mr A Wilfred Adams on refractory ulcerative cystitis At the section of epidemiology and state medicine on Feb 27 at 2 30 P M Dr Robert Cruickshank will open a discussion on cross-infection in wards There will be a meeting of the section of radiology at 2 30 P M, on the same day, at Hammersmith Hospital, Ducane Road, W 12, when cases will be shown

Employment of Alien Doctors

The regulations governing the employment of alien doctors of enemy nationality in EMS hospitals have been further relaxed and in future these practitioners may be employed where there is only one other British resident In the hospitals where there is only a single resident the employment of an alien will probably also be allowed but permission must first be obtained from the Minister of Health Similarly in larger hospitals two aliens may be employed where there is a total staff of 14 or 15 doctors and three aliens where there is a staff of 25 The policy of employing these friendly aliens has been amply justified but the Minister of Health points out that many who possess suitable experience and qualifications are still unemployed He hopes that as vacancies occur hospital authorities will fill them with aliens as a matter of course

Pneumonia jackets are not subject to rationing and should be supplied coupon free

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export

Births, Marriages and Deaths

BIRTHS

COYLE —On Feb 11 in London the wife of Dr Cecil Coyle—a son

DICK —On Feb 3, in Leeds, the wife of Captain A Peter Dick, R A M C—a daughter

GABB —On Feb 9, in Oxford, the wife of Major Hoadley Gabb R A M C—a son

MAYBURY —On Feb 12, at Godalming, the wife of Mr B C Maybury F R C S—a daughter

PARSONS —On Feb 8, the wife of Dr C T E Parsons, of Mildenhall—a son

SANDELL—On Feb 12 the wife of Dr L J Sandell, of Epsom—a son

MARRIAGES

BARRIE—CASTLETON —On Feb 7, at Kettlewell, Howard John Barrie B M, to Olive Margaret Joan Castleton

DEATHS

CARRUTHERS —On Feb 13 at Taunton John Carruthers, M D GLASG, late of Chatsworth Gardens Eastbourne

CUTCLIFFE —On Feb 11, at Torquay Montagu Cutcliffe M R C S aged 72

DAVIS —On Jan 29 George Bertram Davis M B LOND, F R C S medical officer, S Rhodesia aged 31

HAYES —On Feb 10 Edwin Charles Hayes C B E, L R C P I D P H, lieut-colonel R A M C, retd, aged 7[illegible]

HEBB —On Feb 15, at Ronkswood Hospital Worcester Sir John Hebb C B C B E B M OXFD

LIGHTSTONE —On Feb 12, Herbert Lightstone, D S O M C M D MCGILL

NEWMAN —On Feb 10, at Bishop's Stortford John Campin Newman O B E, M B CAMB, F R C S, aged 69

PAPILLON —On Feb 11 at Taunton James William Papillon M R C S of Brent Knoll Somerset

WITHERS —On Feb 10 at Dorchester, Samuel Henry Withers C M G M B R U I lieut-colonel R A M C retd

YOUNG —On Feb 1[illegible] at Windermere John Doctor Young M D GLASG late of Blackpool aged [illegible]

Notes, Comments and Abstracts

TUBERCULOSIS THE PREVENTIVE APPROACH

In the British Isles about 1500 people between the ages of 15 and 50 die every month of pulmonary tuberculosis In times of peace the total number of patients with tuberculosis, amounting to about a quarter of a million, is maintained by a steady flow of new cases, in war-time both new cases and deaths increase Long familiar with these dreadful facts, the National Association for the Prevention of Tuberculosis has set out a policy for the discovery of symptomless pulmonary tuberculosis in a memorandum addressed to general practitioners and all others concerned with the health of young people of school age or about to enter industry or the public or national services

Tuberculosis of the lungs begins without the patient's knowledge, and by the time he comes for treatment the disease is advanced and he has probably already infected others Prevention must therefore depend on discovering patients in the early stages, before they have become infectious At present this can only be done by X-ray examination of the chest, which can nowadays be carried out rapidly on large numbers of people The association believe that more X-ray examinations of apparently healthy people, especially those in their teens and early twenties, are needed, and that if they understood the value of the method, the public would insist that it should take the place of older, less effective methods The Trades Union Congress of September 1941 was in favour of X-ray examinations of young workers, and passed a resolution urging the Government to provide for such an examination, to be carried out not less than a year after young people enter industry, and to be repeated every year until they reach the age of 18 In the opinion of the association, every young person ought to be examined radiologically on leaving school as well as at intervals during early adult life Those who enter the Forces could most easily be included in such a scheme, but it should also be possible to bring in those entering the service of the Government or of local authorities, as a safeguard not only to themselves but to their fellows Youths and girls in secondary and technical schools, and colleges and universities are also at a period of life when physical and mental strain is great and the incidence of tuberculosis high The association appeals to doctors responsible for health in such institutions to inaugurate or encourage the use of routine X-ray examinations Many workers in the offices and factories of commercial firms are not entitled to pensions and come under no regular scheme of medical examination except National Health Insurance Some employers arrange for medical inspection, including X-ray examination, and this is carried out with the approval and cooperation of the workers

The tuberculosis services—which have grown up for the most part since the last war—can normally deal with the patients sent to them, but they deal largely with those who are already ill The association is urging an advance in prevention Since English government proceeds by consent, it is for public opinion to achieve this advance It should go hand in hand with provision of greater economic security for the tuberculosis family as *part of a national scheme of social welfare*, this in turn would encourage tuberculous patients to seek early treatment The memorandum ends with the significant remark that X-ray manufacturers will shortly be ready to provide apparatus as soon as they receive orders

VITAMINS AND HÆMORRHAGE

In his Honyman-Gillespie lecture on Jan 22 Dr Harold Scarborough said that it was possible to support the conception that all forms of bleeding were due to trauma if one included the physiological stresses and strains of muscular movement and the upright posture The mechanism of hæmostasis was complex and might be defective in coagulation time, in bleeding time, clot retraction, number and quality of platelets, capillary integrity, or intravascular pressure In thrombocytopenic purpura, he said, it had been suggested that vitamin C might lessen the hæmorrhagic tendency since in this condition the capillaries were abnormal He had been unable to show in his cases that vitamin C had any such effect, nor had vitamin A been more successful though thrombocytopenia had long been known to occur in A-deficient rats Evidence had been obtained by Schiff and Hirschberger that the substance in some preparations of vitamin A which was active in increasing the thrombocyte count was a fat-soluble substance distinct from vitamin A which they designated vitamin T, but the existence of this substance was still doubtful The hæmorrhagic tendency in jaundice had been shown to be due to a prothrombin deficiency resulting from impaired absorption of vitamin K when bile was absent from the intestine Low prothrombin values were found in other conditions—for example, in sprue, which was associated with defective fat absorption The action of vitamin K in increasing the plasma prothrombin and correcting the coagulation defect depended on adequate hepatic function Low prothrombin values were found in disorders of the liver without jaundice, and in these the parenteral administration of vitamin K did not remedy the defect Ivy and his associates had shown that a large number of patients with jaundice had bleeding times longer than the average, and that this defect was benefited by vitamin D, which not only increased the thrombocyte count but shortened the coagulation time In one case of prolonged obstructive jaundice Dr Scarborough had been able to show that nikethamide (nicotinic acid diethyl amide) reduced the abnormal capillary fragility In scurvy there was a hæmorrhagic tendency associated with increased capillary fragility The results of tests of capillary fragility in scurvy had to be assessed with care since the fragility lessened immediately after a subcutaneous hæmorrhage and might then be normal, whereas just before the hæmorrhage, or some time afterwards, it was greatly increased The hæmorrhages of scurvy could be arrested and controlled by the administration of vitamin C but this did not diminish the fragility of the capillaries When natural vitamin C was given in the form of citrus fruit juice both the bleeding and the capillary fragility were improved, owing to the fact that vitamin C was accompanied in its natural sources by the water-soluble vitamin P The capillary fragility of scurvy could be favourably influenced by the administration of pure vitamin P and when vitamins C and P were given together in pure form bleeding was stopped and the fragility of the capillaries became normal

MAKING SPIRIT NASTY

Two new formulæ—which *contain* brucine instead of diethyl phthalate—for surgical spirit have been approved by the Commissioners of Customs and Excise The quantity of alkaloid used is gr 10 per gallon, which is equivalent to about 0 014% The formulæ which have been in use during the past ten years contained 2% of diethyl phthalate in addition to other denaturants The approved formulæ therefore contain a basis of industrial methylated spirit—that is, 95% of 95% ethyl alcohol denatured with 5% of crude methyl alcohol—with additional denaturants to make the liquid nauseous These additional denaturants are now castor oil, methyl salicylate and brucine, or castor oil, mineral naphtha and brucine Diethyl phthalate, now replaced has many industrial uses, including the manufacture of varnish for aircraft, so that the present substitution releases a valuable material A recent ruling of the Home Office given in the *Poisons Amendment Rules*, 1942, exempts surgical spirit containing less than 0 015% of brucine from the Pharmacy and Poisons Act, 1933, and the poisons rules, *otherwise* the sale of brucine is not affected The methylated spirit regulations, 1930, which require surgical spirit to be labelled "For external use only—not to be taken" still apply to all sales of the spirit

Appointments

CALVERLEY, MARIE M B LEEDS, D R C O G R M O at St John's Emergency Maternity Home, Western Favell Northamptonshire

DUNLOP, E MCH NAIRN L R C P E R S O at Mount Gold Hospital, Plymouth

KRAMER, M V, M B WITWATERSRAND, F R C S E R S O at the County Hospital Whiston, Lancs

LAUDER ANNE, M B EDIN asst R M O at Warren Road Hospital Guildford

MCLENNAN, W A M B GLASG, D P H M O to the B S A Company, Birmingham

YEARSLEY, MACLEOD, F R C S aural surgeon to Lancroft Nursing Home, Gerrard's Cross

ORIGINAL ARTICLES

TREATMENT OF INTRACAPSULAR FRACTURES OF THE FEMORAL NECK

A S BLUNDELL BANKART, M CHIR CAMB , F R C S
ORTHOPÆDIC SURGEON TO THE MIDDLESEX HOSPITAL SURGEON TO THE ROYAL NATIONAL ORTHOPÆDIC HOSPITAL

IT is generally agreed that, whenever the condition and the circumstances of the patient permit, an intracapsular fracture of the neck of the femur should be accurately reduced and fixed with a Smith-Petersen nail or similar device The only notable exception to this rule is the subcapital abduction fracture in which the head of the bone is slightly displaced and impacted on to the upper border of the fractured neck This fracture always heals with bony union if it is treated in a short walking plaster for 12 weeks It will come as a shock to many surgeons to learn that in approximately 1 out of every 3 cases the nailing operation, as usually done, is a failure THE LANCET (1941) has drawn attention to two recently published series of end-results, both of which show a high percentage of ultimate failures There is no reason to suppose that these records are exceptionally bad, and the conclusion is reached that " clearly the intracapsular fracture of the neck of the femur still presents a formidable problem "

Much attention has been given to the technique of inserting the nail, but little is known about the factors which determine success or failure in individual cases The object of this paper is not to present yet another series of end-results but to indicate some points which seem to call for further consideration if this operation is to be placed on a surer basis

SELECTION OF CASES

Many cases of intracapsular fracture are quite unsuitable for nailing Yet little discrimination has been shown in the selection of cases, and some surgeons boast that no case has been refused operation except when the condition of the patient was desperate It has been represented that this operation is a life-saving measure, but this is not true No case of the kind has ever died for want of being operated upon but not a few have died as the result of it

Although fracture of the neck of the femur may occur at almost any age it is typically a fracture of old or elderly people Contrary to the popular belief, old people stand surgical operations remarkably well, provided they are reasonably healthy and the operations are not unduly long or bloody But an operation should not be done unless the patient is likely to live long enough to enjoy the benefits of it It can seldom be justifiable to nail a fracture in a patient over 80 years of age At 80 the expectation of life for a man is 4 9, and for a woman 5 5, years Actually most patients operated upon over this age are dead from one cause or another within a few months On the other hand, many patients in the seventh decade of life may expect to lead reasonably active lives for a number of years after a successful nailing operation, and these as well as younger patients may be spared the crippling effects of an ununited fracture of the neck of the femur

There are local as well as general conditions to be considered before doing a nailing operation I doubt whether the operation is worth doing in the case of the high subcapital adduction fracture when the head of the femur is broken off practically flush with the acetabulum However accurately the nail is placed, the mechanical fixation of the head is likely to be precarious and bone absorption with slipping of the head off the end of the nail is often observed In such cases it is better to do a transtrochanteric osteotomy at once rather than wait for the failure of a nailing operation

In some cases fracture of the neck of the femur is a torsion injury being produced by an inward twist of the body while the foot is fixed on the ground When this happens, the anterior part of the neck is broken across more or less transversely, but the thin bone in the concavity of the neck behind is crushed together as the fragments angulate When this type of fracture is reduced the anterior parts come together accurately, but a wide deficiency is opened up behind as the angulation is corrected In the days when open reduction and fixation of these fractures was done I have more than once exposed this condition and have observed that, when a drill or other instrument was passed into the neck, it lay bare and exposed at the bottom of the deficiency in the bone It is difficult to imagine how such a defect could be filled up with bone in the process of healing, and it would seem that even a bone-graft would have a precarious existence in such a situation

Osteo-arthritis of the hip is common in old people, and it would be interesting to know how many patients with fracture of the neck of the femur already have osteo-arthritis at the time of the accident Osteo-arthritis may cause limitation of movement long before there are appreciable X-ray signs of it In examining a case of osteo-arthritis of the hip it is not uncommon to find that there is some limitation of movement, especially of rotation, in the opposite " sound " hip, although no complaint has been made of it If the head of the femur cannot move freely in the acetabulum after a fracture of the neck has been nailed, great strain will be put on the proximal fragment when the hip is moved, and this may cause damage to the head, leading to absorption and non-union If osteo-arthritis is present or suspected, the fracture should not be nailed, or, if nailed, the hip should be immobilised as well But it would be better to do an osteotomy instead

Traumatic osteo-arthritis of the hip is not uncommon after comparatively trivial injuries in elderly people, and it is not unreasonable to suppose that the same injury which fractures the neck of the femur may also produce osteo-arthritis Can anything be done to prevent this ? Does movement increase this liability ? Should the hip be kept at rest until the traumatic reaction has settled down ? The question of immobilisation will be considered in relation to the after-treatment of the nailing operation

Interference with the blood-supply of the proximal fragment has been held responsible for absorption of bone and non-union But in every complete fracture of the neck of the femur the proximal fragment is for the time being deprived of its blood-supply, for I do not think anyone really believes that the circulation is maintained through the ligamentum teres, so that if this were the cause one would expect absorption to occur in practically every case It is possible, however, that while the head is deprived of its blood-supply it is more vulnerable to stresses and strains which may fall upon it

Considerable importance has been attached to the direction of the fracture as determined by the angle which the fracture line makes with the horizontal (Pauwel. quoted by King 1939) or with the shaft of the femur (Eyre Brook and Pridie 1941) It has been pointed out that the more vertical the fracture line, the greater the shearing force and the less the thrust between the fracture surfaces, and therefore the less the likelihood of bony union, while the more nearly the fracture line approaches the horizontal, the less the shearing force and the greater the thrust, and therefore the greater the chances of bony union It has been suggested that the more vertical fractures are unsuitable for nailing alone and that bone-grafting should be done in addition It will be noted that these observations imply (1) that a vertical (weight-bearing) force will be put upon the fracture before it has united , (2) that a shearing force can operate between the fracture surfaces although the whole point of the nailing operation is to prevent it , and (3) that a thrust or impacting force is a factor in bringing about bony union Clearly these mechanical conditions have a bearing on the technique of the nailing operation which will be considered presently.

There is no general agreement as to how the patient should be treated after a fracture of the neck of the femur has been nailed Some surgeons allow walking almost at once, while others forbid it for about 4 months, believing that too early weight-bearing is a cause of absorption of bone and non-union But all encourage active movements of the hip during this period

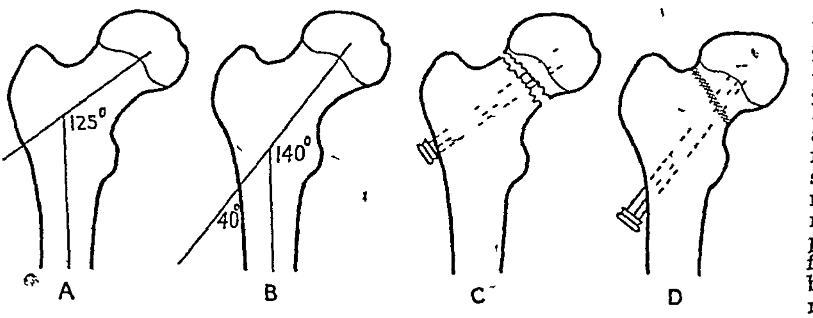
In this connexion it is interesting to recall that the impacted subcapital *abduction* fracture always heals with bony union, if it is treated in a short walking plaster spica, and in this case early weight-bearing does not lead to absorption of the head of the femur Bohler (1935), however, makes the significant statement that he has "often seen marked changes in the head of the bone and pain, in cases of abduction fractures which have not been immobilised, but these do not occur if the fracture has been fixed"—that is, in a short walking plaster If this is true, it *suggests that weight-bearing on an impacted* fracture is not in itself harmful, so long as the joint is not moved, but that weight-bearing and movement together lead to changes in the femoral head We shall have to consider whether this has any bearing on the treatment of *adduction* fractures after internal fixation, whether in fact the nailed adduction fracture ought not to be treated in the same way as the impacted abduction fracture—in a short walking plaster

When cases unsuitable for nailing have been eliminated, the principal causes of failure are imperfect reduction of the fracture, faulty application of the nail, and inappropriate after-treatment

REDUCTION OF THE FRACTURE

Accurate reduction of the fracture is an essential part of the nailing operation There are four ways in which this may be done (1) by preliminary weight-extension in bed, (2) by the manipulation described by Leadbetter, (3) by traction and manipulation on an orthopædic extension table, and (4) by the "well-leg counter-traction" method of Roger Anderson

The great advantage of reduction by weight-extension is that there is no hurry The surgeon can play with it, adjusting the weight and the position of the limb, until it is just right Moreover, the patient has time to settle down The disadvantage of this method is the difficulty in getting the patient from his bed to the operating table without disturbing the reduction of the fracture To meet this difficulty Bailey (1937) advocated a "complete bed technique," doing the nailing operation in the patient's bed with the extension still on the limb This would be ideal, if one could be persuaded that it is an operation which can properly be done in a bed Most surgeons prefer to reduce the fracture on the operating table



The disadvantage of reducing the fracture on the operating table, whether by manipulation or by means of an extension table, is that the reduction is not always perfect at the first or even the second attempt But the surgeon is always anxious to get on with the operation, and he is tempted to accept as good enough a reduction which he really knows is not perfect The Leadbetter method certainly gives a good reduction in many cases, but it is not infallible and we have to admit that there is an element of luck about it When an extension table is used a good reduction can generally be assured, but far more time is taken in fixing the limbs to the extension bars and reducing the fracture than most surgeons are willing to admit, and here also the surgeon is working against time

In my unit we have now overcome these difficulties by using the Roger Anderson method of well-leg counter-traction, which, as its name implies, makes traction on the injured limb by using the sound limb for counter-traction or resistance By this method the fracture is quickly reduced but it can be checked and if necessary adjusted at leisure, and when the reduction is perfect the patient can be lifted safely on to the operating table with the traction still on the limb The original apparatus has been modified by Mervyn Evans (1941) and adapted for skin traction, so that it is not necessary to put a pin through the tibia Sufficient traction can be obtained by adhesive plaster for the short time required to reduce and nail the fracture

INSERTION OF THE NAIL

It is a common practice to place the nail in the long axis of the neck of the femur—that is, at an angle of about 125° with the shaft Indeed, many of the special instruments invented for this purpose are made to fit the curve of the bone where the great trochanter joins the shaft But it is clear that with the nail in this position the greater part of a vertical force will fall across the nail while a very small part of it, if any, will be directed outwards along the nail (A in figure) Therefore, if early weight-bearing is permitted there will be a considerable *danger of the nail breaking and no tendency to* press the fracture surfaces together On the other hand, the more vertically the nail is placed the less will be the breaking strain across it and the more will the proximal fragment be guided towards and pressed against the distal fragment by pressure from above The best angle for the nail is one of 140° with the long axis of the shaft of the femur (B in figure)

It must be remembered that a nail can hold fragments apart as well as hold them together If the slightest gap exists between the fragments, either from absorption of bone or from insufficient impaction of the fracture, non union will occur unless the gap can be closed If the nail is placed too horizontally, the gap will not be closed, indeed, the fragments will be actually held apart (C in figure) But, if the nail is placed at an angle of 140°, pressure from above will be directed downwards and outwards and the proximal fragment will be guided by the nail into contact with the distal fragment (D in figure)

So far from early weight-bearing being a cause of non-union, I believe that it is almost essential for bony union, and that absence of this factor is actually responsible for non-union in many cases The need for positive pressure between the fracture surfaces has been recognised by a number of surgeons who have devised special screws or bolts which are intended to exert an approximating action on the fragments But by far the most effective approximating force is the body-weight, provided that it is made to act in the required direction The Smith-Petersen nail is to be regarded not merely as a means of holding the fragments together but as a sort of slide which will direct and carry the proximal fragment towards the distal fragment when pressure is brought to bear on it from above That weight-bearing favours bony union has been shown by Kleinberg (1937), Apfelbach and Aries (1936), and others in the ambulatory treatment of fractures of the neck of the femur in long abduction plasters The Smith-Petersen nail, however, obviates the obvious disadvantages of the long plaster

Sometimes the nail is partially extruded from the bone after a nailing operation, and steps have been taken to prevent this by fixing the head of the nail to the cortex of the shaft of the femur Such devices are ill-conceived and may be disastrous A nail which has been properly put in does not drop out of the bone but it may be pushed out Partial extrusion of the nail means that some absorption has occurred at the fracture line, and the proximal fragment is settling down on to the distal fragment carrying the nail with it (D in figure) If this is prevented, the fragments will be held apart by the nail and the fracture will fail to unite (C in figure) Radiograms taken some time after a successful nailing operation nearly always show some shortening of the femoral neck

A nail can be inserted quite accurately into the required axis of the neck of the femur by following a few anatomical directions and without the use of any special aiming devices or gadgets

If a line is drawn from the centre of the femoral head downwards and outwards at an angle of 140° it will cut the outer surface of the shaft at a point 1½ in below the base of the great trochanter and at the complementary angle of 40° with the shaft below this point (B in figure) This measurement is practically constant in the normal adult femur Incidentally, this point is on a level with the base of the lesser trochanter which also may be used as a guide If sufficient of the shaft is exposed, the angle of 40° (a little less than half a right angle) can be easily estimated by eye, or if help is needed a little triangular metal plate can be used to give the required angle Moreover, if the base of the plate is made exactly 1½ in long, it can be used also to measure the distance from the base of the great trochanter

At this level the anterior surface of the shaft of the femur is an almost flat surface having the same inclination to the coronal plane as has the neck of the femur, so that if a guide is entered at a point on the outer surface midway between the anterior and posterior borders, and in a plane parallel to the anterior surface, it will be correctly placed in the lateral radiograms Bailey has used this flat surface to give direction to his special aiming device But this instrument is made to fit the curve of the bone immediately below the great trochanter, so that the nail is inserted too high and too horizontally

I believe that more accurate work can be done when the site for the insertion of the nail is exposed to view than by any method of blind pinning Moreover, it is possible to do a clean operation through an adequate incision, whereas strict asepsis is not possible when instruments are passed in and out of a small wound and allowed to come in contact with the skin It may not be out of place here to recall Arbuthnot Lane's dictum that, in the operative treatment of fractures, loosening of screws and absorption of bone are due either to faulty mechanics or to a degree of sepsis which is not recognised in ordinary surgery The nailing of a fracture of the neck of the femur should be done with the same exact care and attention to asepsis as any other important bone operation It is rather regrettable that some surgeons seem to have vied with one another in doing this particular operation through the smallest possible incision and in the shortest possible time

THE NAILING OPERATION

The steps of the nailing operation may be summarised as follows.

(1) The fracture having been reduced by the well leg counter traction method, the patient is anæsthetised, preferably in bed, with 'Pentothal' followed by gas and oxygen He is then taken to the theatre in the traction apparatus and placed upon the operating table An X-ray cassette holder is placed under the affected hip, so that films can be inserted and removed from the opposite side of the table It is most desirable that two X ray machines should be available, so that that they can be left in position throughout the operation Anteroposterior and lateral radiograms are taken at once, both as a final check on the reduction and to ensure that the X ray tubes are correctly placed

(2) The skin is painted with iodine or spirit and sterile towels are placed in position An incision is then made on the outer side of the thigh so as to expose at least 3 in of the upper end of the shaft of the femur The length of the incision depends entirely on the depth of the bone from the surface If the incision is too short, it is impossible to apply the guide at the correct angle to the bone Sterile towels are, of course, fixed to the sides of the wound

(3) When the outer surface of the bone has been exposed, a flat instrument is passed along its anterior surface just below the level of the great trochanter, and if this surface is not exactly in a horizontal plane the limb is rotated slightly until it is horizontal

(4) At a point on the outer surface, 1½ in below the base of the great trochanter and midway between the anterior and posterior borders, a small hole or depression is made with an awl The awl is held at right angles to the surface of the bone It is impossible to start a drill accurately at an acute angle to the hard cortical bone unless a hole or depression is made first I have found it convenient to bevel the sides of the hole with a small rose head burr

(5) A 2 5 mm guide mounted on a hand drill or motor is directed into the hole at an angle of 40° with the shaft below and strictly in the horizontal plane—that is, parallel to the anterior surface of the femur As already stated, a small metal gauge may be used to measure the angle A little rubber ring (cut from a piece of tubing) is previously placed on the guide at a distance of 3¼ in from the point, and a second rubber ring is placed 2 in higher up The total length of the guide is 10 in The guide is now rapidly driven into the bone for exactly 3¼ in (up to the first rubber ring)

(6) Anteroposterior and lateral radiograms are now taken and quickly developed From these films three observations are made whether the guide is correctly placed in both planes, whether the length of guide in the bone is the correct length for the nail, and what further penetration is needed to fix the point of the guide in the acetabulum

If the technique here described has been carefully followed, it will rarely if ever be found that the guide is not correctly placed When the guide is inserted at an angle of 140°, it will generally be found that a 3¼–3¾ in nail is required The correct length can easily be estimated from the known length of guide in the bone Allowance must be made for impaction of the fracture A further penetration of 2 in will usually suffice to fix the point of the guide in the acetabulum, and it will be remembered that there is already a second rubber ring placed at this distance further up the guide All these points can be seen at a glance in the radiograms When they have been satisfactorily determined, the first rubber ring, which is now in contact with the bone, is slipped up the guide as far as the second, and the guide is driven in for a further 2 in

The importance of anchoring the proximal fragment to the pelvis while the nail is being driven in will be appreciated by anyone who has exposed this fracture at open operation Since the smooth head of the femur slips about in the acetabulum on the slightest provocation the comparatively blunt end of the on coming nail is likely to cause displacement unless the head is fixed by the guide It is not enough that the guide should merely penetrate the head Cases have been reported in which the end of the guide was bent by the displacing action of the nail When the guide is driven right through into the acetabulum, the head is securely held and no such displacement can occur No harm has ever been reported from the small punctures of the articular surfaces

(7) The drill or motor is now detached A Smith-Petersen starter is passed over the guide and placed so that one of its fins is directed towards the upper border of the femoral neck The starter is gently tapped into the bone, care being taken not to split the bone When the cortex has been penetrated, the starter is withdrawn and the selected nail is threaded over the guide and driven home with a punch When the head of the nail reaches the bone, a large punch is used, which overlaps the head of the nail, so that the bone and the nail are struck together The extension cord is now cut and the fracture is impacted by a number of heavy blows on the punch with the mallet The guide is now pulled out with pliers, and final radiograms are taken

(8) The divided muscles are sutured with catgut and the skin with silkworm gut The extension apparatus is removed and the patient is returned to bed

(9) The skin stitches are removed on the tenth day, and a short plaster spica is applied For reasons already given it is desirable, if not essential, to get the patient up and walking soon after this operation Most patients should be walking in 2–3 weeks The mechanical safety of the hip depends almost entirely on the angle at which the nail is inserted Whether movement of the hip should be allowed at this stage is open to question If movement is harmful in the case of the impacted abduction fracture, it is difficult to avoid the conclusion that it may be equally harmful to the nailed adduction fracture, so that we are now fixing the hip in a short walking plaster for twelve weeks after the nailing operation Time alone will show whether this is necessary or desirable

SUMMARY

Poor results often follow internal fixation of fractures of the neck of the femur Many of these results have been obtained by experienced surgeons who may be presumed to have mastered the technique of the methods they employ Their results, therefore, are not likely to be improved by a slavish adherence to the same methods

Many cases are unsuitable for the nailing operation Such cases should be eliminated and treated by other methods Indiscriminate nailing will inevitably give a high percentage of failures

Imperfect reduction of the fracture is often seen in the radiograms of published cases This is usually due to hurry and to the unwillingness of the surgeon to prolong or postpone the operation when first attempts at reduction have been only partially successful

The well-leg counter-traction method enables the fracture to be reduced at leisure and the operation to proceed as soon as the patient is on the operating table

Too much attention has been paid to the technique of inserting a nail into the long axis of the neck of the femur and too little thought given to what the nail does when it gets there The use of the nail is not merely to hold the parts of the fracture together but to convert a shearing force into a thrust or approximating force, when weight is borne on the fracture The angle at which the nail is inserted is therefore most important

The operation here described is a straightforward bone operation based on anatomy and simple mechanics The only special instruments required in addition to the nail are the guide, the starter and the punch A little angle-gauge is also useful

The common practice of forbidding weight-bearing for some months after the operation while encouraging active movements of the hip is noted, and reasons are given for believing that early weight-bearing should be encouraged while movements of the hip should be prevented until bony union has taken place

REFERENCES

Apfelbach, G L and Aries, L J (1936) *Surg Gynec Obstet* 63, 341
Bailey, E T (1937) *Lancet*, i, 375
Bohler, L (1935) Treatment of Fractures, Bristol, p 300
Evans E M (1941) *Lancet* ii, 483
Eyre Brook A L and Pridie, K H (1941) *Brit J Surg* 29, 115
Kleinberg, S (1937) *J Bone Jt Surg* 19, 964
Lancet, 1941, ii, 316
Pauwel, F , quoted by King, T (1939) *Brit J Surg* 26, 721

PHYSIOLOGICAL EFFECTS OF BLAST

P L KROHN,
B M OXFD

D WHITTERIDGE,*
B M , B SC OXFD

S ZUCKERMAN,
D SC LOND , M A OXFD, M R C S

(From the Departments of Human Anatomy and Physiology, Oxford Work carried out for the Research and Experiments Department, Ministry of Home Security)

THIS paper is one of a series of studies on the physiological effects of blast, carried out for the Ministry of Home Security Previous published reports of this work have dealt mainly with the general character of the lesions caused, with their relation to lesions observed in air-raid casualties, and with the mode of their occurrence (Zuckerman 1940, 1941) The present paper is concerned both with the latter problem and with the effects blast has on the cardiovascular system, on the respiratory mechanism and on cortical activity The way in which blast produces its effects on the body has been the subject of much speculation, and different views that have been put forward have been reviewed in our earlier reports Of the other problems, the only one which, to our knowledge, has been studied experimentally is the influence of blast on arterial and venous pressure This question was closely investigated by Hooker (1924), whose observations are referred to in the relevant section below

METHODS

Animals —75 rabbits, 2 monkeys and 2 cats were used in the present experiments Clinical observations were also made on goats, guineapigs and mice All animals in which any preliminary surgical procedures were carried out were anæsthetised with 'Nembutal' during the whole course of the experiment

Method of exposure —With a few exceptions mentioned below, the rabbits were restrained (without any covering of the trunk) by wire harness in a normal standing position, and were suspended in wire mesh cages from scaffolding, tail on to a bare charge placed on the ground Two rabbits were exposed (tail on to the charge) after the thorax, and 1 after its abdomen, had been cased in plaster bandages Seven rabbits were exposed head on to the explosion in a closed steel cylinder with their heads projecting from a hole in one end The animal's neck was rigidly held by plaster of paris bandages to a projecting "flange" around the hole, the fit between head and flange being air tight The cylinder, whose capacity was 15 litres, effectively resisted the blast of the charge

Charge and method of measurement of blast-pressure —The size of charge varied from 8 to 33 lb polar ammon gelignite and the distance of the animals from 6 to 14½ ft In each experiment a piezoelectric gauge was placed immediately under the cage (or in the steel box experiments immediately over the front of the box) to register the blast pressure The gauges were placed sideways to the explosion and thus recorded only the raised hydrostatic pressure The animals were under direct observation within 15 sec of the explosion

Electrocardiographic records —The field laboratory and recording apparatus were 80 yards from the site of the explosions Leads were taken from the trunk by silver foil electrodes implanted under the skin of the right shoulder and left thigh These electrodes were connected by shielded leads to an amplifier, cathode ray tube and camera This method has the advantage of robustness and sensitivity over the string galvanometer, and was thus more suitable for the conditions under which the experiments were made The time constant of the amplifier was 0 013 sec A large potential fluctuation occurred at the moment of detonation By reducing the amplification in steps before firing, and raising it immediately afterwards, full sensitivity of the amplifier was restored ½ to 1 sec after the explosion Thus in protected animals (see below) the record of the E C G was completely unchanged 1 sec after exposure

Blood-pressure —In 4 rabbits the arterial blood pressure was studied by the carotid loop method (Van Leersum 1911) The pressure in the loop could be measured accurately about a minute after the explosion In 6 other rabbits the femoral or carotid artery was cannulated, and control pressure readings obtained by means of a mercury manometer The animal was then removed from the apparatus and exposed to the explosion Even in the most favourable circumstances there was an interval of about 4 min after the explosion before the next series of readings The venous pressure was obtained with a water manometer by cannulation of the central end of the jugular vein

Respiratory mechanism —Two silver wires, insulated except at their tips, were inserted into the xiphisternal slip of the diaphragm and tied in position An earth electrode was sewn into the subcutaneous tissues of the abdominal wall Insulation was not always complete and an electrocardiogram was often superimposed upon the record of the diaphragmatic action potentials Records were also obtained of the total electrical activity in the vagus nerve in the neck The perspex shielded electrode of the Sherrington type which was used was firmly sewn down to the prevertebral muscles The records obtained were not completely monophasic

Cerebral activity —The 2 cats and 2 monkeys used for this study were kept anæsthetised with repeated doses of nembutal for periods of up to 6 hours before exposure Two stainless steel electrodes were screwed into the skull, so that they just touched but did not damage the dura mater The scalp was closed over the electrodes, which were insulated from it as far as possible In favourable circumstances the prolonged anæsthesia gave a fairly stable background of cortical activity in the form of a 10 per sec rhythm of large amplitude against which alterations due to blast could be studied The animals were exposed head on to the charge The time constant of the amplifier in these experiments was 1 2 sec

Post-mortem examination —All animals were autopsied immediately after death and selected tissues studied histologically The findings were similar to those described in earlier papers (Zuckerman 1940, 1941) The characteristic lesions in the lungs and abdominal viscera are immediate in their onset, and have been observed within a minute after exposure to blast

Results

MODE OF ACTION OF BLAST ON THE BODY

The view is still sometimes expressed that blast causes lesions in the lungs by "forcing its way" down the trachea The opposite view that injuries resulting from blast are due to the direct impact of the wave on the body wall and not to blast acting through the upper respiratory tract was based primarily on the following considerations (Zuckerman 1940, 1941)

1 When animals are exposed sideways and close to small explosions, the lesions are unilateral and on the side facing the explosion When placed further from the charge the lesions are bilateral Presumably shielding occurs close to the explosion

2 The disposition of lesions in the part of the lungs relating to the costo mediastinal and phrenico costal sinuses suggests that they are due to an external "blow"

3 Lesions occur in abdominal and other organs as well as in the lungs

4 Animals exposed to low blast pressures close to a small explosion with their trunks clothed in thick sponge rubber suffer less severely than controls Animals exposed near the explosion with only one side of the trunk covered in rubber,

---

* Beit Memorial Research Fellow

and with the covered side facing the explosion, suffer no injury or only very slight injury to the lungs When exposed with the uncovered side to the explosion, they suffer severe damage to the lung of that side, and less severe damage to the lung of the opposite side

5 Rabbits were exposed head-on very close to a big charge in wooden boxes through which only their heads projected. In those cases in which the boxes were not badly crushed, pulmonary lesions were slight or absent

Final confirmation of the view that blast affects the lungs not through the respiratory passages but through the body wall was obtained in 7 experiments in which rabbits were exposed in a steel cylinder head-on to the charge In some experiments E C G leads were taken in the usual way, and as a rule a piezo-gauge was also placed in the cylinder A second gauge was placed immediately above the front of the cylinder In one experiment the maximum hydrostatic pressure registered outside the cylinder (i e , on the head) was 133 lb /sq in , and inside 2 lb /sq in Since at the distance it was from the explosion the animal's head was also subjected to wind pressure, and also to reflections from the surface of the end of the cylinder the effective pressure it experienced may be safely taken to have been at least twice the recorded pressure. This particular animal was dead when seen 15 sec after the explosion There were no lesions in the lungs and other thoracic or abdominal organs Death was due to damage to the head The contents of the middle ear were disrupted , there was blood in the nose nasal sinuses and mouth , there was slight conjunctival hæmorrhage and considerable bleeding into the retrobulbar tissues Although its neck was stretched by the explosion and its head was apparently displaced, no vertebral lesion was seen. Cerebral lesions were, however encountered , there was subpial hæmorrhage over both olfactory lobes, and also slight bruising of the occipital lobes presumably resulting from a movement of the head back on to the collar The rest of the brain was normal

In the 6 subsequent experiments of this type the meati were plugged and the ears padded with cotton-wool and strapped to the side of the cylinder In one of these experiments the head was exposed to an effective pressure of almost 200 lb /sq in The animal was "conscious" when seen 15 sec after the explosion There was no blood in the mouth or nose The respiratory rate was only slightly raised Ten minutes after the explosion the heart-rate was too fast to be counted, but subsequently it fell to normal limits Within an hour after the explosion the animal was walking round the room and eating food It appeared completely normal No lesions were found at autopsy Of the remaining 5 animals, 3 sustained cervical fractures , 2 of the 3 were killed outright The fractures were presumably caused by the head being violently bent against the neck-flange of the cylinder Of the remaining 2 animals, 1 was killed outright In none of the 5 animals were there thoracic or abdominal lesions The only damage seen in the C N S was subpial hæmorrhage over the olfactory bulbs and hæmorrhage in relation to the cervical fractures No damage to the external or middle ear was seen in those animals whose ears were protected

In all these experiments the pressures to which the animals' heads were subjected were well above the level at which it has been found that 50% of exposed but unprotected rabbits will be immediately killed as a result of visceral lesions This level is for convenience referred to below as the P_{50} pressure It can be safely concluded, therefore, that thoracic and abdominal lesions resulting from blast are not due to either the pressure or suction components of the wave acting through the upper respiratory passages, but that, on the contrary, blast exercises its effects on the surface of the body

The suction component appears to have little or no effect in the production of lesions Thus in the experiments referred to above, in which animals were exposed sideways and close to small explosions the suction component was experienced all round the body while the far side was shielded from the pressure component by the near side, which received all the injury In another set of experiments, animals were exposed to a shock wave without a following suction component Typical blast lesions were nevertheless caused It is thus clear that the thoracic and abdominal lesions resulting from blast are due to the impact of the pressure component on the body wall The experiments that have been carried out do not exclude the possibility that the lesions caused by the pressure component may be added to as a result of the body wall being pulled outwards by the suction component, which while relatively of very low pressure has a longer duration

It is possible to restrict the effect of the impact of the blast wave on the body wall to the chest or the abdomen by protecting either part with plaster. The lesions in the part protected are usually minimal. while the unprotected region appears to be more severely damaged than usual.

Closure of the glottis is of no importance in the causation of the lesions The latent period between stimulation of the animal by the arrival of the blast wave and closure of the glottis can hardly be less than 25 m sec The shock wave would in fact have passed long before the vocal cords could begin to close. It also seems immaterial, at least from the point of view of visceral lesions, whether the mouth is open or closed in an explosion, since no appreciable amount of air could travel up or down the trachea in the time intervals involved

THE HEART

Rabbits exposed to blast pressures high enough to cause immediate death (2 to 3 times the P_{50} level) show a slowing of the heart-rate by 60–70% and diminution in the amplitude of the E C G record, without any alteration in the coördination of the heart beat This slowing persisted in vagotomised or atropinised animals exposed to similar high pressures and was absent in animals whose trunks were protected by the steel cylinder This finding was first taken to indicate that the blast wave has a direct effect on the heart muscle However, it was subsequently found in laboratory experiment that similar slowing occurs if the aorta and inferior vena cava of a rabbit are simultaneously severed in the abdomen This procedure brings the circulation almost immediately to a standstill and it seems likely that the slowing of the heart which was observed in those animals that had been exposed to very high pressures may have been at least partly due to an abrupt cessation of the circulation Possible factors in such a circulatory standstill will be considered later

Observations were also made on 15 rabbits exposed to pressures about the P_{50} level for this species , 6 of these animals survived the explosion In these experiments, as in those in which animals were exposed to much higher pressures, no alteration was observed in the coordination of the beat, although short periods of alternation in the amplitude of the QRS complex and a few ventricular extrasystoles were occasionally observed Only 2 of the 15 animals exposed to these lower pressures showed a slowing of more than 7% The greatest immediate slowing observed in any animal was about 20% Furthermore no significant differences were observed in the amplitude of the E C G record of these animals

Essentially similar results were obtained from unanæsthetised rabbits with surface leads Survivors frequently showed great acceleration of the heart-rate some 20 sec after the explosion, possibly due to the liberation of adrenaline

At autopsy all the above animals showed severe pulmonary bruising occasional bruising (and sometimes rupture) of abdominal organs retrobulbar hæmorrhage, and ruptured ear-drums

In contrast to the minor changes in the E C G in animals surviving exposure to blast, it may be noted that there are several clinical reports of abnormalities of the heart action following direct trauma to the chest wall (Barber 1940, Beck 1935)

BLOOD-PRESSURE

The arterial blood-pressure was always reduced within the range of blast pressures studied (half to twice the P_{50} value) The animals investigated may be divided into four groups

The first consists of those which die within a minute or two of the explosion No method of recording blood pressure continuously was available and the only observation on pressure in this group of animals was obtained from one which had an exteriorised carotid artery The pulse was palpable 30 sec after the explosion, and had disappeared 30 sec later It made a transient reappearance 5 min later

The second group consists of animals which were not killed outright, but which died within half an hour When the first records were taken after the explosion, the blood pressure had dropped from the original level of 90 mm Hg to 30–40 mm Hg The pressure remained at this low level until death occurred

The third group comprises animals which survived exposure in spite of relatively severe internal lesions Immediately after the explosion the blood-pressure dropped, and in one instance no pulse was palpable for about 4 min (fig 1) In these animals, however, the pressure recovered rapidly in the first 10 min There was a slower and more prolonged rise towards the control level during the ensuing hour

The fourth group consists of animals which showed a transient small drop in pressure The normal blood pressure was reached in about 30 min or less

An attempt was made to increase the systemic blood-pressure by increasing the venous return If the abdomen of a normal animal is squeezed, there is a transient rise in systemic arterial blood-pressure, due presumably to increased venous return, followed by a slight fall mediated through the carotid sinus mechanism (de Waele and Van der Velde 1939) This effect was reproduced in 2 anæsthetised rabbits before exposure to blast After exposure, compression of the abdomen, far from raising the systemic blood-pressure, led to a 25% fall The pressure returned to its previous level in the ensuing minute The fall in pressure is associated with a sharp rise in the respiratory rate, which persisted for half an hour (fig 2) The experiment was carried out twice in each animal

Adequate observations on venous pressure were obtained on only 1 rabbit, which showed a slight and continued fall in pressure after the explosion

RESPIRATION

Rabbits which survive exposure to blast pressures in the region of the P_{50} level show a brief apnœa, followed by slow irregular and jerky breaths, which later give place to regular rapid and shallow respirations During the apnœa, which lasts from 5 to 20 sec, there is a very large centripetal discharge in the vagus, which decreases after the first few sec but remains 60–100% above the previous resting level (fig 3) During the apnœa there is considerable maintained activity in the diaphragm, which implies a strong slow inspiratory effort (fig 4) Short phasic discharges corresponding to individual breaths then become superimposed on the tonic discharge from the diaphragm At first they are two to three times as large as those of normal breaths, occur at irregular intervals and show a very sharp beginning and end Gradual quickening may occur after 2 or 3 min In fig 4 the rate had risen after 7 min from the normal level of 14 to 90 per min

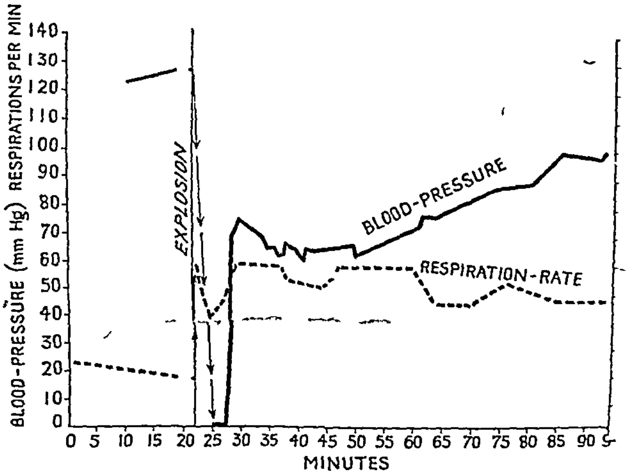


FIG 1—Blood pressure and respiration rate of a rabbit (712) which survived exposure to a P_{50} pressure

Rabbits which have been more severely affected die after a few minutes of slow, jerky respiration It is unusual for an animal to die without making some inspiratory effort after the explosion

In animals less severely affected the amplitude and duration of the maintained discharge in the diaphragm are less, and in some cases rapid breathing is established within 15–20 sec (fig 5) Animals in which lung damage was slight had respiration-rates of up to 200 per min (i e about ten times the initial rate) With these high rates there is usually some tonic discharge between breaths, suggesting that the diaphragm fails to relax, and that the chest adopts an inspiratory position The depth of respiration cannot be inferred from the height of the diaphragmatic action potentials, since the resistance opposed by the lung to expansion may change very greatly over the period recorded The respiration rate reaches a peak about half an hour after exposure and slowly declines over a number of hours It may be still raised 24 hours after exposure It was found in one experiment that the rapid breathing was stopped by double vagotomy and was replaced by normal deep vagal breathing The animal (a rabbit) survived half an hour before it was killed and there was no sign of cyanosis before death Direct observation suggested that the depth of respiration was sometimes greater than normal, and in these cases the total ventilation was probably greatly increased An attempt to record total ventilation was unsuccessful

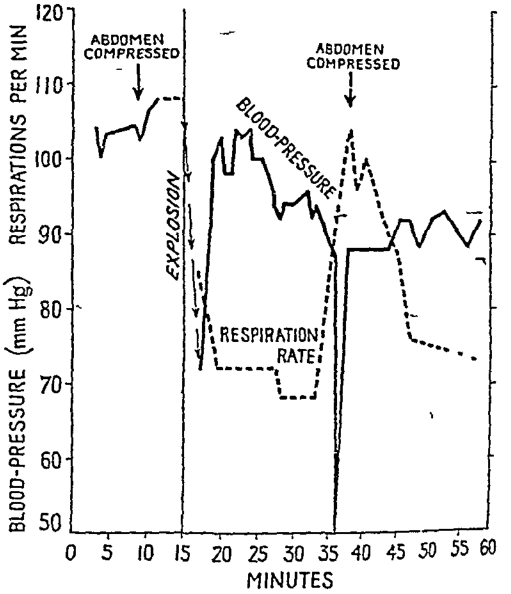


FIG 2—Blood pressure and respiration rate of a rabbit (710) which died 2 hr after exposure to a P_{50} pressure The effects of compressing the abdomen before and after exposure are shown

Rapid breathing was observed in rabbits, cats, monkeys and goats In severely affected mice, monkeys and goats another type of breathing was also seen Breathing was slow, with an expiratory grunt, and sometimes a double expiratory movement occurred, consisting of passive relaxation followed after a short pause by a contraction of the abdominal muscles In these animals severe lesions amounting to “ hepatisation ” of the lungs were found at autopsy When the chest was opened the lungs failed to collapse

This type of breathing was never observed in rabbits —a negative finding which may be related to the relatively weak abdominal muscles of these animals

If pulmonary œdema should occur subsequently, as it sometimes does, the respirations become slower and deeper, the blood-pressure falls and signs of asphyxia appear

CEREBRAL CORTEX

Attempts to detect abnormalities in the electrocorticogram several hours after exposure were unsuccessful An attempt was therefore made to record from the cortex of 2 cats and 2 monkeys during exposure to blast In the first cat the only abnormality recorded was a small depression of electrical activity from 14 to 17 sec after the explosion This was followed by temporary restoration of previous activity, although the animal had suffered severe pulmonary damage and died 14 min later The record of the second cat was normal when it was first readable 5 sec after the explosion, 5 sec later, however, cortical activity almost disappeared It

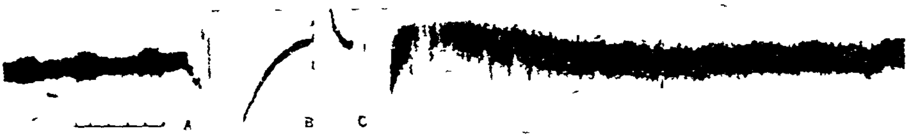


FIG 3—Records of increased centripetal activity in the vagus trunk of a rabbit (721) which died 2 min after exposure to a P_{50} pressure The amplification is reduced at A and raised at C The explosion occurred at B (Intervals on scale here and in subsequent figures = 1 sec)

returned after a further 12 sec and was apparently normal after another 11 sec An attempt was made to imitate this effect by squeezing the vertebral arteries, 32 min after the explosion this produced an immediate decrease of activity; 36 min after the explosion depression of activity began 3 sec after vertebral compression and passed off 7 sec after the compression was released In a normal animal anæmia produces a decrease of cortical activity in 8–10 sec (Gerard and Sugar 1938)

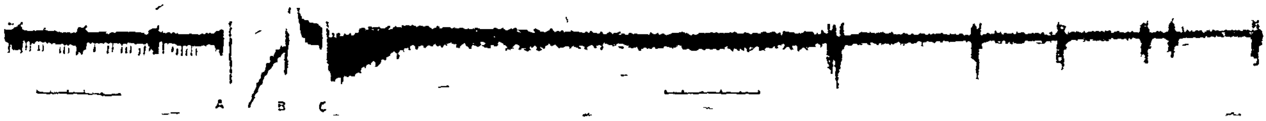


FIG 4—Record of diaphragmatic action potentials in a rabbit (731) which survived exposure to a P_{50} pressure An E C G is superimposed on the tonic diaphragmatic activity before the explosion

The electrocorticogram of one rhesus monkey showed no change either when the record was first readable 20 sec after the explosion, or later, but that of a second monkey was similar to the record of the second cat This monkey showed a well developed σ discharge of 9–11 cycles per sec due to the nembutal (fig 6*a*), with occasional large waves at 2 per sec, 23 sec after the explosion a small burst of σ waves at 9 per sec was visible No further σ waves were visible until 7 min later, but during this interval the slow waves had become larger and more frequent (fig 6*b*) With the reappearance of the σ waves the larger slow waves disappeared, and half an hour later the record became normal Afterwards the blood-pressure began to fall gradually, and the σ rate increased to 14–16 per sec Asphyxial convulsions occurred 1 hr 40 min after the explosion

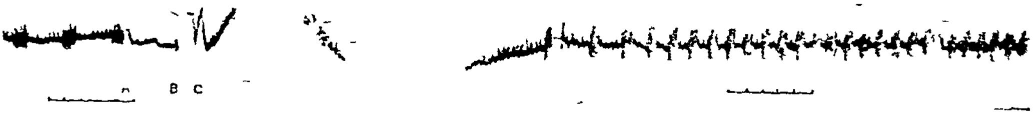


FIG 5—Record of diaphragmatic action potentials in a rabbit (733) which survived exposure to a pressure below the P_{50} level The displacement of the base line after the explosion is due to a movement artefact

Discussion

The field conditions under which the work had to be carried out imposed certain limitations on the investigation In general the fact that records had to be taken 80 yd from the site of the explosion meant that only changes which had an electrical sign could be measured continuously, while records of blood-pressure could not be made for some minutes before and after the explosion Again, only one amplifier channel was available, and consequently it was impossible, for example, to take simultaneous records of activity in the vagus and diaphragm The resources of the improvised field laboratory were also inadequate for full analysis of the respiratory changes Nevertheless, a coherent picture of the physiological changes which result from blast has been obtained

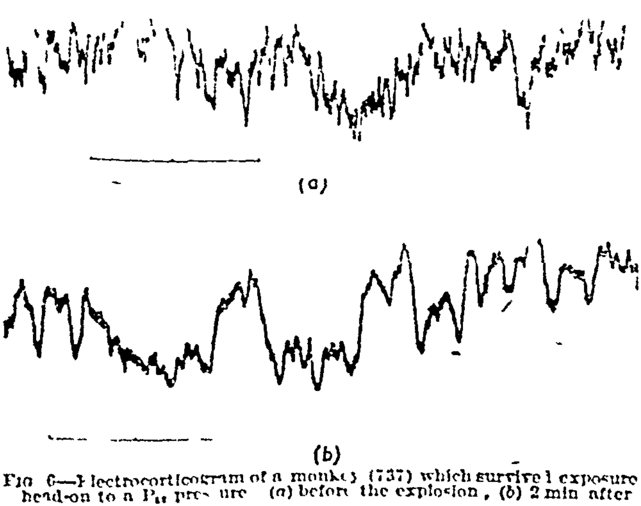


FIG 6—Electrocorticogram of a monkey (737) which survived exposure head-on to a P_{50} pressure (*a*) before the explosion, (*b*) 2 min after

EFFECTS ON THE HEART

The electrocardiographic experiments were undertaken to test the possibility that the immediate cause of death in animals killed outright by blast is ventricular fibrillation In fact, as the records show, there appears to be no lack of coordination of the heart-beat in blasted animals The time of onset of changes in the E C G of rabbits whose circulation is arrested has been checked in laboratory experiments When the circulation is suddenly arrested no change occurs for 2 min The first visible change is a "high take-off" to the T wave, this is followed about 1 min later by an increase in the P–R interval In animals which are killed outright by blast the same changes occur in the form of the E C G at the same intervals after the explosion, a fact which suggests an immediate arrest of the circulation, Severe but transitory anoxæmia of the heart may also occur in animals which survive exposure to blast Thus in one animal no change in the P–R interval occurred for 2–3 min after the explosion It increased by 20% at 5 min and returned to normal at 10 min

It may be noted that small hæmorrhages have occasionally been seen both in the pericardium and epicardium of animals killed by blast (Zuckerman 1941)

EFFECTS ON BLOOD-PRESSURE

Animals exposed to explosions show an immediate fall in arterial blood-pressure, which in extent and duration bears a relation to the peak blast pressure experienced Observations on venous pressure were, as noted, limited to a single animal in which the first observation was made 15 min after the explosion. Although the respiratory rate was seven times the normal, the venous pressure of this animal showed a slight and maintained fall after the explosion It is clear, therefore, that the respiratory acceleration was not due to raised venous pressure (cf Harrison 1930)

Falls in the blood-pressure of dogs were observed by Hooker (1921) in his study of shock resulting from gun-blast and the blast from high explosive He did not note the profound immediate fall in arterial pressure observed in the present study, presumably because his earliest observation was never made sooner than 7 min after exposure and often not before half an hour had passed

Maintained falls as profound as those he observed in dogs were noted in only 1 of 7 rabbits in our experiments. On the other hand, our single observation on venous pressure agrees with those of Hooker in demonstrating a slight maintained fall.

Similar falls in blood-pressure can be produced by vagal inhibition of the heart and by peripheral vasodilatation, as for example in the subconcussive states described by Denny-Brown and Ritchie Russell (1941). We have, however, never seen any evidence of a vagal slowing of the heart except in animals in which damage has occurred to cervical vertebræ. In vagal slowing there is some reduction in P–R interval corresponding to a shift of the pacemaker, often nodal rhythm, and usually some irregularity due to escape from the vagal control. When slowing of the heart has been observed in blasted animals before the effects of anoxæmia supervene, there has been slight decrease of the P–R interval never nodal rhythm, and perfect regularity. If "primary nervous shock" occurs in such animals, it must depend on peripheral vasodilatation almost entirely without any vagal inhibition of the heart—unlike the condition described by Denny-Brown and Ritchie Russell.

Furthermore, it should be noted that rabbits show an immediate fall in blood-pressure when exposed to high blast pressures with either their chest or their abdomen completely protected by a close-fitting plaster jacket. In the former case the lungs, in the latter the abdominal viscera, show minimal lesions, whereas the unprotected viscera in each case are very severely damaged. It is evident, therefore, that either pulmonary or extrapulmonary trauma can cause an immediate drop in blood-pressure, and clearly both factors may operate in an unprotected animal exposed to blast. It is significant that one anæsthetised animal exposed with its chest protected by plaster survived in spite of severe abdominal lesions and severe "shock" which persisted until it was killed three-quarters of an hour after the explosion. This observation is in accordance with the general conclusion from all our experiments that death or survival are more closely correlated with the severity of the lung lesions than with damage to any other tissues.

It seemed likely that changes in the systemic blood-pressure could be explained as being chiefly secondary to changes in the pulmonary arterial pressure, which the circumstances of the experiments did not allow of measurement. It is safe to assume that the pulmonary blood-pressure is raised in blasted animals in the presence of pulmonary œdema. Observations which suggest that this is so are the frequent occurrence of right-sided dilatation and bilateral hydrothorax in terminal conditions associated with pulmonary œdema. The state of the pulmonary blood-pressure is not so obvious in animals with signs of respiratory "distress" unassociated with œdema. In such animals the systemic blood-pressure is not more than 10–20 mm Hg below its normal value, the venous pressure is not raised, there is apparently no anoxæmia, but the respiratory rate is 5–10 times the initial value.

Experimental obstruction of the pulmonary circuit can result in a somewhat similar picture. Slow constriction of the pulmonary artery may produce a low systemic pressure, but is always accompanied by a rise in the venous pressure (Gibbon, Hopkinson and Churchill 1932). A far more remarkable parallel is provided by Shaw Dunn's observations on the effect of intravenously-injected starch granules in goats (1919), and in the similar experiments on dogs carried out by Binger, Boyd, and Moore (1927). In both cases the respiration-rate rose to 6–10 times the resting rate. An immediate transient rise in the venous, and fall in the arterial, pressure occurred in these animals. In animals which survived this treatment for some hours the subsequent venous and arterial pressure was little different from normal. The circulation-rate, the right ventricular pressure and the arterial CO_2 and O_2 levels were also not consistently affected. The X-ray shadow of the right pulmonary artery was increased. At autopsy the majority of pulmonary arterioles were found to be occluded by starch granules. This will have a similar effect in reducing the available pulmonary vascular bed as the exclusion of zones of the lung by the trauma produced by blast.

The number of capillaries in use in the lungs in a normal animal at rest is only a small fraction of the total. Wearn and others (1934) have estimated that the number through which blood flows at a given moment varies from $\frac{1}{10}$ to $\frac{1}{15}$ of the total number of capillaries in each alveolus. The effect of the large reserve capacity is that the lung can normally accommodate very different volumes of blood with a minimal change in pulmonary arterial pressure. The clinical importance of this factor has been stressed by Brenner (1935). The trauma due to blast, like the blocking of arterioles with starch granules, reduces the total available capillary bed. Consequently the extent to which the pulmonary flow can increase without resulting in a rise of pulmonary blood-pressure sufficient to produce pulmonary œdema will be reduced. When the available capillary bed is just sufficient to accommodate the resting venous return there would be no serious rise in pulmonary blood-pressure at rest. Any increase in venous return would, however, in such conditions, produce a sharp rise. This is presumably what happened in the two blasted rabbits whose abdomens were compressed. In these animals the systemic blood-pressure fell sharply and the respiration-rate rose, changes which Schwiegk (1935) and Daly and others (1937) have shown by direct methods to follow the raising of the pulmonary blood-pressure. A similar mechanism in cardiac asthma has been suggested by Christie (1938).

Should the available capillary bed become insufficient even for the resting venous return, the pulmonary pressure would rise to the level at which pulmonary œdema occurs. In fact, 1 of the 2 animals referred to above died from pulmonary œdema an hour after the effect of increasing the venous return was tested. It is possible that there is a progressive reduction in capillary capacity due to continued hæmorrhage in the lung substance, as has been reported in human beings (Hadfield 1941).

Other factors—for example, local chemical changes affecting pulmonary capillary permeability—probably assist in the production of pulmonary œdema in blasted animals.

EFFECTS ON RESPIRATION

The rise in the respiratory rate, which can be immediate in its onset, may be, as already observed, up to ten times the rate before exposure to blast. It was also observed by Hooker (1924) in dogs. Acceleration of respiration, with increased tonic discharge in the diaphragm, is also produced in rabbits either by suction of air from the trachea or by compression of the chest (Head 1889). Both procedures lead to a large maintained contraction of the diaphragm, followed by rapid breathing. Repetition of these experiments, with records of action potentials in the xiphisternal slip of the diaphragm as in the blast experiments, showed that the respiration-rate may be almost doubled (fig 7). In such experiments the acceleration is limited to the period of deflation of the lungs. It is certain that the positive component of the blast wave is responsible for the visceral lesions due to blast, and the inference is that the impact of the wave results in compression of the chest, which is probably sufficient to produce massive stimulation of the deflation endings.

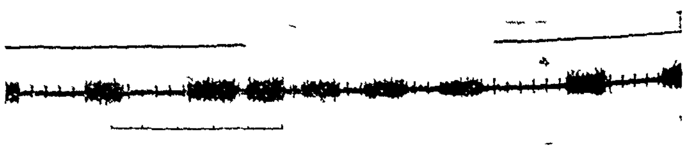


FIG 7—Record of diaphragmatic action potentials of a rabbit. Break in the signal line indicated a period of compression of the chest.

The respiratory rate is raised for several hours after the explosion (e g, 24 hours in a goat). The following evidence suggests that this persisting increase is due to changes in the lungs (e g, hæmorrhages into the alveoli and alveolar walls, spread of blood into atria and possibly atelectasis) rather than to changes in the respiratory centre.

Since the work of Adrian (1933), it is generally accepted that the increased inspiratory effort following compression of or suction of the air from the chest in rabbits is due to stimulation of "deflation" nerve-endings in the lung † These deflation endings are stimulated by extreme degrees of collapse of the lungs By far the larger number of afferent endings in the lungs however, are stimulated by inflation Their frequency of response normally varies with the change in volume of the thoracic cavity, and they inhibit diaphragmatic tone and inspiratory effort In animals exposed to high blast pressures there is always a very large immediate increase in diaphragmatic discharge The increased afferent activity which has also been observed in the vagus of such animals is thus presumably accompanied by a maintained contraction of the diaphragm This could only occur if the afferent impulses in the vagus came chiefly from deflation endings Presumably these are stimulated not only, as suggested above, by the direct effects of the blast wave, but also partly as a result of the development of hæmorrhages

Increased diaphragmatic tone is also present between breaths in rapid and shallow breathing, which may begin as soon as 16 sec after exposure (fig 5) It is probable that the rapid shallow breathing is due to the cutting short of the inspiratory phase, and there is reason to believe that when hæmorrhagic changes have occurred in the lungs, the stretch receptors respond to a given expansion of the chest by a higher rate of discharge than normal Thus in a parallel case Partridge (1935) found that an ending which responded to a given expansion by 60 impulses per sec discharged at 100 per sec after the production of starch emboli, and that endings which were previously inactive also began to discharge Adrian (1933) has shown that these stretch receptors are remarkably difficult to stimulate except by deformation of the lung tissue It is therefore probable that the increased discharge observed by Partridge was due to a greater deformation of the particular ending under investigation Summarising these considerations, it thus appears that damage to the lungs such as is observed after blast or the production of starch emboli results in an increased inspiratory effort due to stimulation of deflation endings, and increased sensitivity of stretch endings to expansion of the lung The summation of these effects could account for the observed immense increase in respiratory rate

The respiratory changes produced by blast can be closely imitated by injecting saline into the trachea of dogs (Harrison 1932) After a short apnœa, respiration in such animals becomes very rapid and shallow Double vagotomy reduces the respiration-rate to the usual level This procedure also reduced the respiratory rate when it had been quadrupled as a result of exposure to blast Neither of these experiments by itself provides conclusive evidence of the rôle the vagal afferent impulses play in the production of rapid shallow breathing, since, as Binger, Brow, and Branch (1924) showed, double vagotomy will also abolish the respiratory acceleration produced by asphyxia of the respiratory centre

Since the work of Davis, Haldane and Priestley (1920), rapid shallow breathing has been taken as a sign of "fatigue" of the respiratory centre, which is accentuated by slight degrees of asphyxia This cannot be its only explanation, for rapid breathing can begin as soon as 16 sec after exposure to blast, and we have never seen any signs of asphyxia except in the terminal condition of pulmonary œdema Furthermore, the arterial blood was fully saturated with oxygen in the only one of our blasted animals in which it was measured, while periodic breathing, which is regarded as a sign of oxygen lack, has never been seen in these animals

The possibility that the impact of the blast wave on the medullary centres may be responsible for the rapid shallow breathing can be ruled out completely, since animals in which the head only is exposed to blast—while the chest is protected—show no respiratory acceleration whatever

It can therefore be concluded that rapid and shallow breathing is related directly to the characteristic changes produced in the lung by blast It reaches its greatest heights with moderate degrees of injury and does not indicate "shock" or anoxæmia of the respiratory centre

When the lung is so severely damaged that whole lobes are completely consolidated, the type of respiration is quite different At autopsy the lungs fail to collapse. There must therefore be an increase in lung viscous resistance (cf Bayliss and Robertson 1939) which opposes inspiration and expiration The elastic recoil of the lungs is no longer sufficient to bring about deflation and the accessory muscles come into play As is observed, grunting and very laboured expiration take place The resistance to inspiration must hinder expansion of the chest so that there is less stimulation of stretch endings. Inspiration will continue for a longer time and the respiration will be laboured and slow

EFFECTS ON THE CEREBRAL CORTEX

The effects produced by blast are quite different from those due to a direct blow on the head, which have been studied by Williams and Denny-Brown (1942) In cats anæsthetised with nembutal, all cortical activity under the electrodes is immediately abolished by the blow. Electrical activity reappears after about 3 min and later slow regular waves appear which are reminiscent of δ waves in human concussion (Williams 1941) The essential difference is that animals exposed to blast show normal cortical activity for 10–20 sec after the explosion The subsequent disappearance of activity cannot be due to the impact of the blast wave but must be some secondary effect induced by it

The four animals whose electrocorticograms were recorded were exposed to pressures high enough to cause death, the animals died in ½–1¾ hours Even when exposed to pressures three to four times as high animals with their heads directly facing the explosion but with their trunks in a steel box were not concussed For example, one such animal at no time lost "consciousness" or its corneal reflex, and was capable of coördinated activity immediately on release The fact that concussion does not occur as a result of the impact of the blast wave is confirmed in cases of human beings who have been exposed to pressures in the region of the estimated human P_{50} (50% lethal pressure) without suffering retrograde amnesia or unconsciousness Reports of feeling "dazed" after an explosion are remarkably common compared to the rarity of histories of retrograde amnesia One of the factors involved may be a cortical anoxæmia due to the circulatory changes discussed above It may be noted that concussion, when it is not due to a crushing blow, is believed by Denny-Brown and Ritchie Russell to result from sudden linear acceleration of the head, the necessary threshold velocity of a heavy hammer striking the head of a monkey or cat being about 28 ft per sec It can be calculated that the required velocity would not be produced by blast except in the immediate neighbourhood of an explosion where the pressures are higher than any that have been referred to above

Histological observation of the cortex of monkeys killed outright by blast show no visible lesions (see Zuckerman 1941, Leach 1942)

CAUSES OF DEATH

There are a number of ways of being killed by blast, of which total disintegration of the body is the extreme case met with very close to an explosion Those animals which are immediately killed without external injury presumably die from that undefined entity known as "primary shock" resulting from extensive visceral lesions Some animals in this group have the trachea or main bronchi completely blocked by solid blood-clot Whatever other factors may have contributed to their deaths, further air-entry would have been impossible Most animals which have died more than a short interval after exposure usually had blood-stained froth in their mouth and nose and have died of pulmonary œdema Others die because of continued hæmorrhage due to damage to an abdominal organ Hæmorrhage into the ventricles of the brain has occasionally been observed in rabbits but not in other species The other changes that have been observed in the nervous system are so slight that they can hardly be regarded as fatal No direct fatal interference with cardiac function has been observed

CLINICAL IMPLICATIONS

It is tentatively suggested that the physiological changes described above, being common to a number of species, also apply to man, and that they lead to certain conclusions, of which some are suggested below, about the management of injuries to the lungs due to blast, and of corresponding injuries, unassociated with open chest wounds and not directly due to blast, which are sometimes seen in air-raid casualties

---

† The work of Partridge (1939) suggests that these 'deflation endings' may in fact be proprioceptive fibres from the pulmonary blood vessels

A moderate or severe degree of pulmonary blast injury may be associated with symptoms of tightness in the chest, difficulty in drawing a deep breath, and the feeling of having been " kicked in the stomach " These symptoms are related to an overactive Hering-Breuer reflex In the presence of other injuries they may be inconspicuous, and diagnosis may have to depend primarily on the rate and character of the respiration and on collateral symptoms and signs Ruptured ear-drums and pain in the ears are probably the more important of the latter, among which may be included for convenience a clear history of the incident—if it can be obtained All published clinical reports speak of dyspnœa as a prominent symptom, but give little information of its nature On the basis of our animal experiments, rapid shallow breathing or slow breathing with laboured expiration are to be expected The latter is related in animal experiments to increased lung viscosity, which opposes the elastic recoil of the lungs and prevents the normal ascent of the diaphragm—a condition which occurs in " idiopathic " emphysema (Christie *1934*), where collapse of the lung is prevented by absence of elasticity It may account for the ballooning of the lower part of the chest that has been observed in human beings who have suffered from the effects of blast (Dean, Thomas and Allison 1940, O'Reilly and Gloyne 1941)

If our inferences on the state of the pulmonary circulation are correct, such patients have a greatly reduced pulmonary capillary reserve Any increase in venous return or pulmonary congestion is liable to produce pulmonary œdema and collapse, a fact which gives strong support to the suggestion that general anæsthesia or blood-transfusion are contra-indicated in this condition (*Lancet*, 1940, ii, 426) Symptomless cases may, by exerting themselves, increase the pulmonary blood-pressure to dangerous levels

The observation that venesection may be beneficial in such conditions (O'Reilly and Gloyne 1941) also accords with the picture of the state of the pulmonary circulation that has been described above Rational treatment for slow breathing with laboured expiration, where the lung viscosity is increased, would seem to be the administration of oxygen Where the respiratory rate is increased, and the breathing is rapid and shallow, there is the danger of partial anoxæmia (Haldane and Priestley 1935) In such cases, oxygen to prevent anoxæmia, and morphia to decrease the respiratory rate without increasing its depth, would seem to be indicated For obvious reasons CO_2 would seem to be contra-indicated.

Summary

A series of experiments in which rabbits' trunks were protected while their heads were directly exposed to high blast pressures has confirmed earlier observations that thoracic and abdominal lesions resulting from blast are due to the wave acting on the surface of the body and not to either the pressure or the suction components of the wave acting through the nose and mouth The thoracic and abdominal lesions are primarily due to the impact of the pressure component on the body wall and the lesions can occur when the suction component is excluded

Electrocardiographic records show that there is no lack of coordination of the heart beat in blasted animals, although anæsthetised animals exposed to pressures high enough to cause immediate death may show a slowing of the heart-rate by 60–70% and a diminution in the amplitude of the record Similar findings have been observed if the circulation is stopped by severing the abdominal aorta and inferior vena cava The electrocardiogram of animals which survive exposure to high blast pressures may show evidence of a transitory phase of anoxæmia Only slight slowing of the heart occurs in anæsthetised animals which survive, while the rate in unanæsthetised animals is frequently accelerated

Animals exposed to blast show an immediate fall in arterial blood-pressure, which in extent and duration is related to the peak blast pressure experienced There is a slight maintained fall, as found by Hooker, in venous pressure These " shock " symptoms are not due to vagal inhibition

While the falls in pressure can be regarded as being partly a " shock " effect of pulmonary or extrapulmonary trauma, it seems that changes in the systemic blood pressure can be explained as being chiefly secondary to changes in the pulmonary blood flow

The condition of the pulmonary circulation in severely blasted animals can be paralleled in animals which have received intravenous injections of starch In both the extent of the reserve capillary bed is reduced, and the danger of a rise in the pulmonary arterial pressure and of pulmonary œdema as a result of increased venous return made greater

There is usually a prolonged and great increase in the respiratory rate of rabbits which survive exposure to blast This appears to be due to stimulation of deflation endings and increased sensitivity of stretch endings to expansion of the lung, and not to chemical changes affecting the respiratory centre or to any direct effect of blast on the medulla When the lung is so severely damaged that whole lobes are consolidated, respiration is very laboured, because of changes in the elastic recoil of the lungs

Animals exposed to high blast pressures are not concussed Electrocorticogram records as a rule either show no change or changes which can be related to cortical anoxæmia resulting from general circulatory changes

Possible ways in which blast may cause death are considered Immediate death unassociated with external trauma appears to be due to " shock " following internal injury This condition is sometimes associated with occlusion of the larger air-passages by blood-clot Delayed death is as a rule due to pulmonary œdema and more rarely to intraperitoneal hæmorrhage

Certain clinical implications are also discussed The crucial points in the diagnosis of " blast " when signs of pulmonary or abdominal damage exist are an accurate history of the circumstances of the injury and the state of the ear-drums and middle ear Rapid shallow breathing or slow laboured breathing may be expected Treatment should be directed to avoid overtaxing an already diminished pulmonary capillary reserve Oxygen, morphia and venesection may be beneficial, while transfusion, general anæsthesia and exertion are contra-indicated

We should like to express our thanks to the Chief Adviser and officials of the Research and Experiments Department of the Ministry of Home Security, and to the Director and officials of the Road Research Laboratory for help given us in these investigations We are also grateful to Sir Thomas Lewis for his opinion on the electrocardiographic records and for his advice about the general problem, to Mr E H Leach for his cooperation in the study of the histological changes in the nervous system, to Dr G M Brown for preparing the carotid loop animals, and to Mr F Etty for his technical assistance

REFERENCES

Adrian, E D (1933) *J Physiol* 79, 332
Barber, H (1940) *Brit med J* ii 520
Bayliss, L E, Robertson, G W (1939) *Quart J exp Physiol* 29, 27
Beck C S (1935) *J Amer med Ass* 104, 109
Binger, C A L, Boyd, D, Moore, R L (1927) *J exp Med* 45, 643
— Brow, G R and Branch, A (1924) *J clin Invest* 1, 127
Brenner, O (1935) *Arch intern Med* 56, 1189
Christie, R V (1934) *J clin Invest* 13, 295, (1938) *Quart J Med* 31 421
Daly, I de B, Ludany, G, Todd, A and Verney, E B (1937) *Quart J exp Physiol* 27, 123
Davies, H W, Haldane, J S and Priestley, J G (1920) *J Physiol* 53, 60
Dean, D M, Thomas A R and Allison, R S (1940) *Lancet*, ii, 224
Denny Brown, D and Ritchie Russell R (1941) *Brain*, 64 93
De Waele, H and Van der Velde, J (1939) *Arch int Physiol* 48, 329
Dunn, J S (1919) *Quart J Med* 13, 129
Gerard, R W and Sugar, O (1938) *J Neurophysiol* 2, 558
Gibbon, J H, Hopkinson, M and Churchill, E D (1932) *J clin Invest* 11, 543
Hadfield, G (1941) *Proc R Soc Med* 34, 189
Haldane, J S and Priestley, J G (1935) Respiration, Oxford
Harrison, T R (1939) Failure of the Circulation London
— Calhoun J A, Cullen, G E, Wilkins, W E and Pilcher, C (1932) *J clin Invest* 11 133
Head, H (1889) *J Physiol* 10, 1
Hooker, D R (1924) *Amer J Physiol* 67, 219
Leach, E H (1942) Unpublished observations

Continued at foot of opposite page

INCIDENCE OF PERFORATED PEPTIC ULCER

EFFECT OF HEAVY AIR-RAIDS

D N STEWART D M DE R WINSER
STUDENTS AT CHARING CROSS HOSPITAL

SHORTLY after the beginning of the second week in September, 1940, when serious raiding on London began, 7 patients with perforated peptic ulcers were admitted within a few days to Charing Cross Hospital, which normally admits 1 a month To discover whether this increase was more than a chance one we approached eighteen other London hospitals, and asked to examine their records from 1937 to 1940 Of these hospitals we visited all but three—at one permission was not granted, another enjoyed a large increase in beds during the period, so that its figures were useless for comparison, and the third was bombed and put out of action in these raids The remainder, though they were selected at random, or often because of some personal kindness, were well-distributed 2 in the centre of London, 1 north, 2 north-east, 1 east, 4 south-east, 2 south, 1 south-west and 3 west

The control period, from January, 1937, to August, 1940, seems to be adequate Until recently there has been no satisfactory control period since the raids of September–October, 1940, for there was a long period of single raids of considerable violence On the whole the experiment was loaded against any absolute increase of perforations in September–October, 1940, because the population of London was then at its lowest, total hospital admissions being lower still But the fact that one of the eighteen hospitals was put out of action in the raids suggests that some part of the increase may have been due to a transfer of emergencies to the hospitals still in action Without having any figures, we believe that this was not an important cause, since most hospitals, even when hit, were able to keep open for emergency work Of the sixteen whose figures we have used, one was out of action from the middle of October, 1940, onwards, and more than half were hit Moreover, this cause should still have been operating in November and December, 1940, neither of which months shows much increase in perforations over the control period, November was particularly low

The results are shown in fig 1 The rise in September-October, 1940, is obvious The monthly average for the four years is 25, excluding September and October, 1940, it is 23, whereas in these two months it was 64 The mean standard deviation, excluding September and October, is 6, including them, 10 The September increase is more than four times the mean standard deviation, the October increase, though smaller, is also considerably more than twice the standard deviation, so that both rises were statistically significant Of the total of 1177 perforations, 100, in 1937 and 1938, could not be dated, and these were averaged over the months, thus making the significance of the peaks in July, 1938, and December, 1937, harder to evaluate As they stand, these peaks are barely statistically significant, they certainly do not rival the rise of September–October, 1940 [*]

CAUSE OF THE RISE

The only recorded parallel to this increase which we could find is reported by Hamperl,[1] who found that perforations became at least ten times as common during a famine period in Russia In an attempt to discover possible causes for such increases we collected a list of suggested ætiologies for peptic ulceration, on the assumption that factors that favour ulceration also favour perforation On this subject von Redwitz and Fuss[2] wrote 387 pages, but the possible ætiologies may be summarised under certain headings acidity, vascular changes, miscellaneous drugs, trauma, bacteria and nervous stress

The summaries of Mann[3] and McCann[4] leave little doubt that high or prolonged acidity and the blockage of small arteries can cause ulceration But clearly neither of these factors was overactive in the September–October, 1940, period without some previous cause, possibly nervous, we cannot assume an idiopathic alteration in gastric or vascular function

There was probably no increase in the use of causative drugs (which include mercury, cantharides, vegetable alkaloids, chloroform, certain hypnotics, magnesium and copper sulphate) except in the case of alcohol and nicotine, and there is no evidence that trauma, which was of course common in the blitz period, played a part in precipitating these perforations Hard food, however, has been a cause of traumatic perforation and failure to heal in animals (McCann,[4] Ivy and Fauley[5]), when it came on top of a previously produced ulcer Hastily swallowed meals, and an increased consumption of tobacco and alcohol may thus all have helped in causing the increase

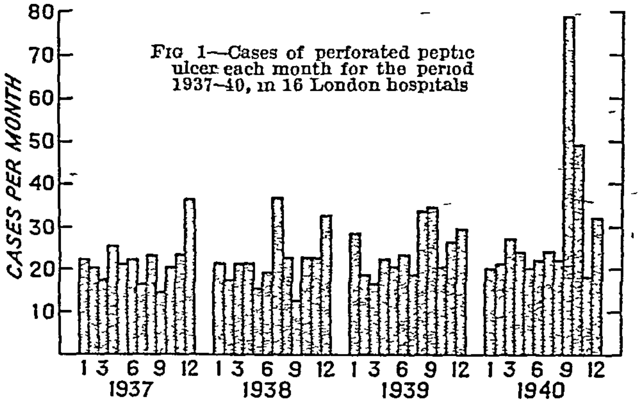


FIG 1—Cases of perforated peptic ulcer each month for the period 1937–40, in 16 London hospitals

The bacterial view of the causation of peptic ulcer, supported by Rosenow,[6] has at one time or another incriminated diseases of the heart, lungs, intestines, gall-bladder, fallopian tubes, meninges, teeth, prostate and tonsils, as well as ten different bacteria There is also support for an infective cause of ulceration in Einhorn's[7] statement that 56% of his recurrences dated from common colds In the period of the raids shelter life began, and an infective factor would have had good opportunities to operate, but Lord Horder has stated that in those times the country's health was particularly good, and there was a drop in November and December, when the shelters were as well patronised as ever Einhorn noted a seasonal fluctuation, what other evidence there is for this[8-15 42] is in favour of a small increase in perforations in autumn and spring, for example, of the 2630 cases of perforation collected by Eliason and Ebeling,[15] 32 4% occurred in October, November and December

There remains the possibility of a nervous cause Cushing[16] and McSwiney[17] have reviewed the effects of section and stimulation of the vagus and sympathetics The results contrast greatly with the known effects of emotion described by Cannon and Alvarez (Hinds-Howell[18] recently reported that the effect of an air-raid warning on test-meal readings was "extraordinary," though he gives no details) It has been suggested that, in view of their frequent anastomoses, neither the vagus nor the sympathetics contain pure parasympathetic or sympathetic fibres And following Schiff and Rokitansky, or more often Cushing,[16] many workers studied the effects of stimulation and trauma of the higher centres We have seen 14 papers recording short series of perforations following brain-surgery, and

---

[*] The increase in deaths from peptic ulcer during the second year of the war is shown by the Registrar General's figures to have been 28% for men and 22% for women (*Lancet* 1942 i 189) The greatest number of deaths, however, occurred in January–June 1941 even though July–December 1940 showed a 20% increase on July–December, 1939

Continued from previous page

O Reilly J N and Glovne S R (1941) *Lancet* ii 423
Partridge R C (1935) *Canad med Ass J* 33, 11 (1939) *J Physiol* 96 233
Schwiegk H (1935) *Pflügers Arch ges Physiol* 236 206
Van Leersum, F C (1911) *Ibid* 142 377
Wearn J T Ernstene A C, Bromer A W Barr, J S German, W J and Zschiesche L J (1934) *Amer J Physiol* 109, 236
Williams D (1941) *J Neurol Psychiat* 4 107
— Denny-Brown D (1942) *Brain* 64 223
Zuckerman S (1940) *Lancet* ii 219, (1941) *Proc R Soc Med* 34 171

species, also apply to man, and that they lead to certain conclusions, of which some are suggested below, about the management of injuries to the lungs due to blast, and of corresponding injuries, unassociated with open chest wounds and not directly due to blast, which are sometimes seen in air-raid casualties

A moderate or severe degree of pulmonary blast injury may be associated with symptoms of tightness in the chest, difficulty in drawing a deep breath, and the feeling of having been "kicked in the stomach" These symptoms are related to an overactive Hering-Breuer reflex In the presence of other injuries they may be inconspicuous, and diagnosis may have to depend primarily on the rate and character of the respiration and on collateral symptoms and signs Ruptured ear-drums and pain in the ears are probably the more important of the latter, among which may be included for convenience a clear history of the incident—if it can be obtained All published clinical reports speak of dyspnœa as a prominent symptom, but give little information of its nature On the basis of our animal experiments, rapid shallow breathing or slow breathing with laboured expiration are to be expected The latter is related in animal experiments to increased lung viscosity, which opposes the elastic recoil of the lungs and prevents the normal ascent of the diaphragm—a condition which occurs in "idiopathic" emphysema (Christie 1934), where collapse of the lung is prevented by absence of elasticity It may account for the ballooning of the lower part of the chest that has been observed in human beings who have suffered from the effects of blast (Dean, Thomas and Allison 1940, O'Reilly and Gloyne 1941)

If our inferences on the state of the pulmonary circulation are correct, such patients have a greatly reduced pulmonary capillary reserve Any increase in venous return or pulmonary congestion is liable to produce pulmonary œdema and collapse, a fact which gives strong support to the suggestion that general anæsthesia or blood-transfusion are contra-indicated in this condition (*Lancet*, 1940, ii, 426) Symptomless cases may, by exerting themselves, increase the pulmonary blood-pressure to dangerous levels

The observation that venesection may be beneficial in such conditions (O'Reilly and Gloyne 1941) also accords with the picture of the state of the pulmonary circulation that has been described above Rational treatment for slow breathing with laboured expiration, where the lung viscosity is increased, would seem to be the administration of oxygen Where the respiratory rate is increased, and the breathing is rapid and shallow, there is the danger of partial anoxæmia (Haldane and Priestley 1935) In such cases, oxygen to prevent anoxæmia, and morphia to decrease the respiratory rate without increasing its depth, would seem to be indicated For obvious reasons CO_2 would seem to be contra-indicated

Summary

A series of experiments in which rabbits' trunks were protected while their heads were directly exposed to high blast pressures has confirmed earlier observations that thoracic and abdominal lesions resulting from blast are due to the wave acting on the surface of the body and not to either the pressure or the suction components of the wave acting through the nose and mouth The thoracic and abdominal lesions are primarily due to the impact of the pressure component on the body wall and the lesions can occur when the suction component is excluded

Electrocardiographic records show that there is no lack of coordination of the heart beat in blasted animals, although anæsthetised animals exposed to pressures high enough to cause immediate death may show a slowing of the heart-rate by 60–70% and a diminution in the amplitude of the record Similar findings have been observed if the circulation is stopped by severing the abdominal aorta and inferior vena cava The electrocardiogram of animals which survive exposure to high blast pressures may show evidence of a transitory phase of anoxæmia Only slight slowing of the heart occurs in anæsthetised animals which survive, while the rate in unanæsthetised animals is frequently accelerated

Animals exposed to blast show an immediate fall in arterial blood-pressure, which in extent and duration is related to the peak blast pressure experienced There is a slight maintained fall, as found by Hooker, in venous pressure These "shock" symptoms are not due to vagal inhibition

While the falls in pressure can be regarded as being partly a "shock" effect of pulmonary or extrapulmonary trauma, it seems that changes in the systemic blood-pressure can be explained as being chiefly secondary to changes in the pulmonary blood flow

The condition of the pulmonary circulation in severely blasted animals can be paralleled in animals which have received intravenous injections of starch In both the extent of the reserve capillary bed is reduced, and the danger of a rise in the pulmonary arterial pressure and of pulmonary œdema as a result of increased venous return made greater

There is usually a prolonged and great increase in the respiratory rate of rabbits which survive exposure to blast This appears to be due to stimulation of deflation endings and increased sensitivity of stretch endings to expansion of the lung, and not to chemical changes affecting the respiratory centre or to any direct effect of blast on the medulla When the lung is so severely damaged that whole lobes are consolidated, respiration is very laboured, because of changes in the elastic recoil of the lungs

Animals exposed to high blast pressures are not concussed Electrocorticogram records as a rule either show no change or changes which can be related to cortical anoxæmia resulting from general circulatory changes

Possible ways in which blast may cause death are considered Immediate death unassociated with external trauma appears to be due to "shock" following internal injury This condition is sometimes associated with occlusion of the larger air-passages by blood-clot Delayed death is as a rule due to pulmonary œdema and more rarely to intraperitoneal hæmorrhage

Certain clinical implications are also discussed The crucial points in the diagnosis of "blast" when signs of pulmonary or abdominal damage exist are an accurate history of the circumstances of the injury and the state of the ear-drums and middle ear Rapid shallow breathing or slow laboured breathing may be expected Treatment should be directed to avoid overtaxing an already diminished pulmonary capillary reserve Oxygen, morphia and venesection may be beneficial, while transfusion, general anæsthesia and exertion are contra-indicated

We should like to express our thanks to the Chief Adviser and officials of the Research and Experiments Department of the Ministry of Home Security, and to the Director and officials of the Road Research Laboratory for help given us in these investigations We are also grateful to Sir Thomas Lewis for his opinion on the electrocardiographic records and for his advice about the general problem, to Mr E H Leach for his cooperation in the study of the histological changes in the nervous system, to Dr G M Brown for preparing the carotid loop animals, and to Mr F Etty for his technical assistance

REFERENCES

Adrian, E D (1933) *J Physiol* 79, 332
Barber, H (1940) *Brit. med J* ii 520
Bayliss, L E, Robertson, G W (1939) *Quart J exp Physiol* 29, 27
Beck, C S (1935) *J Amer med Ass* 104, 109
Binger, C A L, Boyd, D, Moore, R L (1927) *J exp Med* 45, 643
— Brow, G R and Branch, A (1924) *J clin Invest* 1, 127
Brenner, O (1935) *Arch intern Med* 56, 1189
Christie, R V (1934) *J clin Invest* 13, 295, (1938) *Quart J Med* 31 421
Daly, I de B Ludany G, Todd, A and Verney, E B (1937) *Quart J exp Physiol* 27, 123
Davies, H W, Haldane, J S and Priestley, J G (1920) *J Physiol* 53 60
Dean, D M, Thomas A R and Allison, R S (1940) *Lancet*, ii, 224
Denny Brown, D and Ritchie Russell, R (1941) *Brain*, 64, 93
De Waele, H and Van der Velde, J (1939) *Arch int Physiol* 48, 329
Dunn, J S (1919) *Quart J Med* 13, 129
Gerard, R W and Sugar O (1938) *J Neurophysiol* 2, 558
Gibbon, J H, Hopkinson, M and Churchill, E D (1932) *J clin Invest* 11, 543
Hadfield, G (1941) *Proc R Soc Med* 34, 189
Haldane, J S and Priestley, J G (1935) Respiration, Oxford
Harrison, T R (1939) Failure of the Circulation London
— Calhoun, J A, Cullen, G E, Wilkins, W E and Pilcher, C (1932) *J clin Invest* 11 133
Head, H (1889) *J Physiol* 10, 1
Hooker, D R (1924) *Amer J Physiol* 67, 219
Leach, E H (1942) Unpublished observations

Continued at foot of opposite page

INCIDENCE OF PERFORATED PEPTIC ULCER

EFFECT OF HEAVY AIR-RAIDS

D N STEWART   D M DE R WINSER
STUDENTS AT CHARING CROSS HOSPITAL

SHORTLY after the beginning of the second week in September, 1940, when serious raiding on London began, 7 patients with perforated peptic ulcers were admitted within a few days to Charing Cross Hospital, which normally admits 1 a month To discover whether this increase was more than a chance one we approached eighteen other London hospitals, and asked to examine their records from 1937 to 1940 Of these hospitals we visited all but three—at one permission was not granted, another enjoyed a large increase in beds during the period, so that its figures were useless for comparison, and the third was bombed and put out of action in these raids The remainder, though they were selected at random, or often because of some personal kindness, were well-distributed 2 in the centre of London, 1 north, 2 north-east, 1 east, 4 south-east, 2 south, 1 south-west and 3 west

The control period, from January, 1937, to August, 1940, seems to be adequate Until recently there has been no satisfactory control period since the raids of September–October, 1940, for there was a long period of single raids of considerable violence On the whole the experiment was loaded against any absolute increase of perforations in September–October, 1940, because the population of London was then at its lowest, total hospital admissions being lower still But the fact that one of the eighteen hospitals was put out of action in the raids suggests that some part of the increase may have been due to a transfer of emergencies to the hospitals still in action Without having any figures, we believe that this was not an important cause, since most hospitals, even when hit, were able to keep open for emergency work Of the sixteen whose figures we have used, one was out of action from the middle of October, 1940, onwards, and more than half were hit Moreover, this cause should still have been operating in November and December, 1940, neither of which months shows much increase in perforations over the control period, November was particularly low

The results are shown in fig 1 The rise in September-October, 1940, is obvious The monthly average for the four years is 25, excluding September and October, 1940, it is 23, whereas in these two months it was 64 The mean standard deviation, excluding September and October, is 6, including them, 10 The September increase is more than four times the mean standard deviation, the October increase, though smaller, is also considerably more than twice the standard deviation, so that both rises were statistically significant Of the total of 1177 perforations, 100, in 1937 and 1938, could not be dated, and these were averaged over the months, thus making the significance of the peaks in July, 1938, and December, 1937, harder to evaluate As they stand, these peaks are barely statistically significant, they certainly do not rival the rise of September–October, 1940 *

CAUSE OF THE RISE

The only recorded parallel to this increase which we could find is reported by Hamperl,[1] who found that perforations became at least ten times as common during a famine period in Russia In an attempt to discover possible causes for such increases we collected a list of suggested ætiologies for peptic ulceration, on the assumption that factors that favour ulceration also favour perforation On this subject von Redwitz and Fuss [2] wrote 387 pages, but the possible ætiologies may be summarised under certain headings acidity, vascular changes, miscellaneous drugs, trauma, bacteria and nervous stress

The summaries of Mann [3] and McCann [4] leave little doubt that high or prolonged acidity and the blockage of small arteries can cause ulceration But clearly neither of these factors was overactive in the September–October, 1940, period without some previous cause, possibly nervous, we cannot assume an idiopathic alteration in gastric or vascular function

There was probably no increase in the use of causative drugs (which include mercury, cantharides, vegetable alkaloids, chloroform, certain hypnotics, magnesium and copper sulphate) except in the case of alcohol and nicotine, and there is no evidence that trauma, which was of course common in the blitz period, played a part in precipitating these perforations Hard food, however, has been a cause of traumatic perforation and failure to heal in animals (McCann,[4] Ivy and Fauley [5]), when it came on top of a previously produced ulcer Hastily swallowed meals, and an increased consumption of tobacco and alcohol may thus all have helped in causing the increase

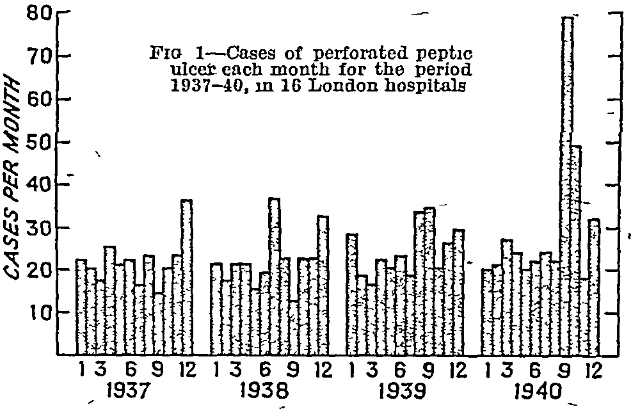


FIG 1—Cases of perforated peptic ulcer each month for the period 1937–40, in 16 London hospitals

The bacterial view of the causation of peptic ulcer, supported by Rosenow,[6] has at one time or another incriminated diseases of the heart, lungs, intestines, gall-bladder, fallopian tubes, meninges, teeth, prostate and tonsils, as well as ten different bacteria There is also support for an infective cause of ulceration in Einhorn's [7] statement that 56% of his recurrences dated from common colds In the period of the raids shelter life began, and an infective factor would have had good opportunities to operate, but Lord Horder has stated that in those times the country's health was particularly good, and there was a drop in November and December, when the shelters were as well patronised as ever Einhorn noted a seasonal fluctuation, what other evidence there is for this [8-15, 42] is in favour of a small increase in perforations in autumn and spring, for example, of the 2630 cases of perforation collected by Eliason and Ebeling,[15] 32 4% occurred in October, November and December

There remains the possibility of a nervous cause Cushing [16] and McSwiney [17] have reviewed the effects of section and stimulation of the vagus and sympathetics The results contrast greatly with the known effects of emotion described by Cannon and Alvarez (Hinds-Howell [18] recently reported that the effect of an air-raid warning on test-meal readings was "extraordinary," though he gives no details) It has been suggested that, in view of their frequent anastomoses, neither the vagus nor the sympathetics contain pure parasympathetic or sympathetic fibres And following Schiff and Rokitansky, or more often Cushing,[16] many workers studied the effects of stimulation and trauma of the higher centres We have seen 14 papers recording short series of perforations following brain-surgery, and

---

* The increase in deaths from peptic ulcer during the second year of the war is shown by the Registrar General s figures to have been 28% for men and 22% for women (*Lancet*, 1942, i, 189) The greatest number of deaths, however, occurred in January–June 1941, even though July–December, 1940 showed a 20% increase on July–December, 1939

Continued from previous page

O Reilly, J N and Gloyne S R (1941) *Lancet* ii, 423
Partridge, R C (1935) *Canad med Ass J* 33 11, (1939) *J Physiol* 96, 233
Schwiegk H (1935) *Pflügers Arch ges Physiol* 236 206
Van Leersum, E C (1911) *Ibid* 142, 377
Wearn J T Ernstene A C, Bromer A W Barr, J S, German, W J and Zschiesche L J (1934) *Amer J Physiol* 109 236
Williams D (1941) *J Neurol Psychiat* 4, 107
— Denny-Brown D (1942) *Brain* 64 223
Zuckerman, S (1940) *Lancet* ii, 219, (1941) *Proc R Soc Med* 34 171

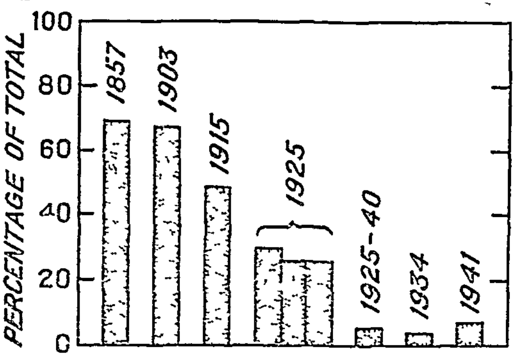


FIG 2—Female cases of perforated ulcer as a percentage of total cases, in recorded series 1857, Brinton[45] (230 cases) 1903, Brunner[11] (361 cases) 1915, Schoemaker[45] (244 cases) 1925, Schwarz[44] (180 cases), others quoted by Schwarz (551 cases, Bager[14] (1500 cases) 1925–40, miscellaneous authors[1 14 8 35 37 42 44 45] (2581 cases) 1934, Eliason and Ebeling[15] (2630 cases) 1941, present series (1055 cases)

Sheehan[19] has summarised the work done on the effect of damage to the hypothalamus After Beattie[20] had demonstrated a parasympathetic, and possibly a sympathetic, hypothalamic centre, Fulton, Keller, Sheehan, Hoff, Watts and others showed that hypothalamic damage produced gastro-intestinal disorders in 25% of cases, damage elsewhere in the central nervous system rarely caused such disorders, and in normal animals they are very rare indeed These disorders included ulceration and perforation, but also such phenomena as ulceration and bleeding as high as the mouth

Clinically a nervous factor in precipitating both ulceration and perforation has been confirmed by Davies and Wilson[21], they were able to show that 80% of ulcers, relapses, hæmatemeses and perforations followed a definite period of anxiety In 100 hernia controls such anxiety only preceded the lesion in 20% Emery and Monroe,[22] in an uncontrolled survey, stated that among 1279 ulcer patients, in 334 fatigue and in 258 emotion and worry seemed to be the main predisposing factors These four workers seem to have put on a sound statistical basis the views which appear in the anthropometrical studies of Draper and Touraine[23] and the psychological studies of Franz Alexander and his co-workers[24] And these workers in turn agree with the expressed views of all the authorities we could consult that anxiety and an over-conscientious and intense mental outlook predispose to ulceration and presumably to perforation as well The earliest mention of such a view that we have found is by Heberden[25]

It seems, therefore, that the possible causes of the September-October increase, and also of Hamperl's Russian figures, are (*a*) anxiety, (*b*) dietetic difficulties, (*c*) increased smoking and drinking, (*d*) an improbable increase in bacterial infection

Smoking and drinking increase partly as a result of anxiety, and there seems to be renewed justification for Alvarez's quotation from Proverbs, xvii, 17 "Better is a dry morsel and quietness therewith than a house full of feasting and strife"

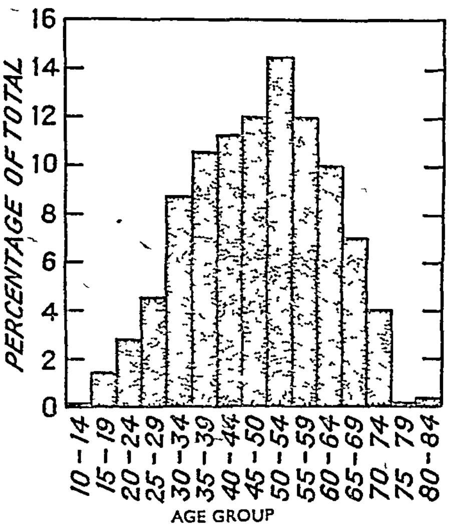


FIG 3—Incidence of perforated peptic ulcer in present series in five year age-groups

AGE AND SEX-INCIDENCE

We collected data on the age, sex and site of perforation in most of these cases The proportion between gastric and duodenal perforations varied so much from one hospital to another (between 9 to 1 and 1 to 9) that it seemed that not all the many operators were concerned with this point There are also wide variations in the literature; Gilmour and Saint[35] in Britain record only 4% of perforations as gastric, against Meyer's[34] 80% in the United States Nicol[36] has lately shown that, judged from hospital records, the proportion of duodenal to gastric ulcers is 1 2 1 in London, 4 4 1 in Leeds, and 11 6 1 in Scotland He points out that there is a large excess of duodenal over gastric ulcers all over the world except in London Our figures for perforations in London (see table) show a fairly constant gastric duodenal ratio over the four-year period, with a slight rise in the proportion of gastric cases in the blitz period over the rest of 1940

SITE OF PERFORATION IN 897 CASES RECORDED IN THE RECORDS OF LONDON HOSPITALS

Date	Gastric		Duodenal		Ratio G D
	No	Av age	No	Av age	
1937	123	45 9	81	48 2	1 52 1
1938	141	48 1	67	49 3	2 10 1
1939	136	50 6	91	48 3	1 49 1
1940 (exc Sept Oct)	92	48 4	74	46 3	1 24 1
1940, Sept , Oct	62	51 9	30	44 5	2 06 1
Total	554	49	343	46 9	1 61 1

Of 1055 perforations in our series, only 7% were in females Jennings[45] has pointed out the remarkable way in which young women have ceased to perforate and to ulcerate In Brunner's[11] 1903 figures, which are confirmed by Brinton's figures of 1857 (Jennings[45]), 171 out of 361 perforations occurred in girls between 17 and 26, in the same age-group, with three times the number of cases, we recorded only 6 The steady decline in female perforations is shown in fig 2, which is a chronological arrangement of all the records we could find[12–14 29–35 37–45] So far as we know, no-one has explained this great decline In the months of heavy raids the ratio of male to female perforations in our series was 13 1

The age-incidence of our collection is given in the table and in fig 3 Jennings and Bager[14] noticed a tendency for perforation in males to take place at an earlier age (which they connected with an increase in duodenal and juxta-pyloric perforations) Our figures, which in fig 4 are compared with the curves of Bager in Sweden, and with two groups of English and American cases between 1925 and 1940,[12–14 28–35 37–39] show a tendency for perforations to take place much later in life We did find, however, that in our series perforations recorded

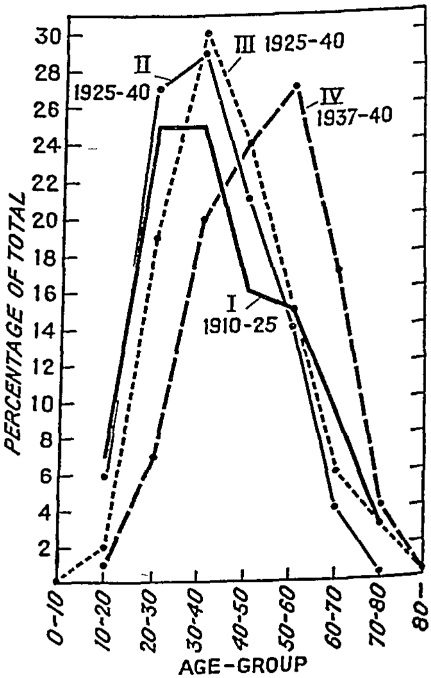


FIG 4—Incidence of perforated ulcer in ten year age groups I Sweden 1910–25 (1089 cases) II Europe 1925–40 (672 cases) III, United States 1925–40 (1678 cases) IV, present series 1937–40 (832 cases)

as duodenal had a younger age-incidence, with a very flat curve between 30 to 65, than the gastric perforations, whose curve was steeper, with a well-marked peak at the 50-60 level In 1937 and 1938 the peak age-incidence occurred at 45-55, in 1939 it was 50-60, while in 1940 there was a peak at 50-60, coupled with a flattening of the curve which indicated more frequent perforations in men from 30 onwards The greater age of our perforations was no doubt partly due to the absence of younger men from London owing to the call-up, but there was evidence of an older age-incidence even before the war began Certainly the older age-incidence did not apply merely in the air-raid period, and the European and American collections, though more similar to Bager's Swedish figures, also show an increase in the 40-50 group As the table shows, there was a remarkable constancy in the average age of perforation over our four-year period In the group of gastric perforations there was a slight rise in average age in the blitz months This was due to the inclusion of 6 very old cases Similarly the slight fall in average age in the duodenal group marked the inclusion of a number of men of 19-33

SUMMARY

Figures for 1937-40 from sixteen London hospitals showed a statistically significant increase in perforated peptic ulcers during the first two months of heavy air-raids (September and October, 1940)

The probable cause for this increase was anxiety

Of the perforations in the four-year period, 93% were in men The ratio of gastric to duodenal perforations was 1 6 1 The peak incidence was in the 50-60 group, this is contrasted with the peak between 20 and 40 in other series

There was no significant change in age, sex or site among perforations in the air-raid period

We are grateful to the authorities and records staff of the following hospitals Connaught Hospital, Guy's Hospital, Lambeth Hospital,* Lewisham Hospital,* Metropolitan Hospital, Miller General Hospital, Poplar Hospital, St George's Hospital, St Giles' Hospital,* St James' Hospital,* St Mary Abbot's Hospital,* St Stephen's Hospital,* University College Hospital, West London Hospital, Whipps Cross Hospital

We also wish to thank Dr Allen Daley, medical officer of health to the L C C, for permission to visit the hospitals under the council's control, marked with an asterisk, and to publish the figures, also the authorities and records department of Charing Cross Hospital, and in particular Mr R A Fitzsimons, Dr C K J Hamilton, Mr W P Greening, and Dr R D Blachford

REFERENCES

1 Hamperl H (1932) *Ergebn allg Path path Anat* 26, 353
2 von Redwitz, E and Fuss, H (1928) in Bruns and Küttner s Neue deutsche Chirurgie, Stuttgart, vol xlii
3 Mann F C (1935) in Eusterman and Balfour's Stomach and Duodenum, Philadelphia, p 52
4 McCann J C (1929) *Arch Surg Chicago,* 19, 600
5 Ivy A. C and Fauley, G B (1931) *Amer J Surg* 11, 531
6 Rosenow, E C (1916) *J infect Dis* 19, 333 (1923) *Ibid,* 33, 248
7 Einhorn, M (1930) *Amer J. med Sci* 179 259
8 Rhodes, G K. and Collins, D C (1933) *Calif West Med* 39, 173
9 Dunbar J (1926) *Glasg med J* 106 109
10 Judin, S (1937) *Surg Gynec Obstet* 64 63
11 Brünner F (1903) *Dtsch Z Chir* 69, 101
12 Sallick M A (1936) *Ann Surg* 104 853
13 Thompson, H L (1937) *Surg Gynec Obstet* 64, 863
14 Bager B (1928) *Acta chir scand* 64 suppl xi
15 Eliason E and Ebeling W W (1934) *Amer J Surg* 24, 63
16 Cushing, H (1932) *Surg Gynec Obstet* 55 1
17 McSwiney B A (1931) *Physiol Rev* 11, 478
18 Hinds Howell C A (1941) *Brit med J* ii 473
19 Sheehan D (1939) The Hypothalamus and Central Levels of Autonomic Function Baltimore p 589
20 Beattie, J (1932) *Canad med Ass J* 26 400
21 Davies D T and Wilson, A T M (1937) *Lancet,* ii, 1353, (1939) *Ibid,* ii 723
22 Emery E S and Monroe R T (1929) *Arch intern med* 43, 846 (1935) *Ibid* 55 271
23 Draper G and Touraine G A (1932) *Ibid* 49 616
24 Alexander F (1934) *Psychoanal Quart* 3 501
25 Heberden, W (1782) Commentaries London p 455
26 Deaver J B and Pfeiffer D B (1921) *Ann Surg* 73, 441
27 Bryce A G (1930) *Brit med J* i 774
28 Gibson, C L (1928) *J Amer med Ass* 91 1006
29 Shelley H J (1932) *Amer J Surg* 15 277
30 Shawan H K. (1933) *Ann Surg* 98 210
31 McCreery, J A (1938) *Ibid* 107 350

Continued at foot of next column

DIPHTHERITIC DIAPHRAGMATIC PARALYSIS
TREATED IN BOX RESPIRATOR

J M TODESCO, M D FLORENCE M R C S, D P H
RESIDENT MEDICAL SUPERINTENDENT OF THE BOROUGH HOSPITAL, CROYDON

THE following case is interesting on account of the successful treatment of the diaphragmatic paralysis by means of the box respirator and because of the many concurrent complications

A girl of 3½ years was admitted to hospital on Sept 23, 1941 as a severe case of diphtheria There was extensive membrane covering both tonsils, the neck glands were much enlarged, she was cyanosed and her breath was fœtid, and the heart sounds were rapid and irregular She had previously suffered from whooping cough and measles Her throat swab was positive for diphtheria before admission

By Sept 30 the throat was clean and the glands had subsided, but she vomited green fluid on several occasions and showed signs of incipient heart failure, the pulse was rapid and of poor volume All food by mouth was stopped but the vomiting persisted until Oct 6, when the heart condition had improved though the pulse rate was still increased Right internal strabismus was noted Two days later the heart went into gallop rhythm and albuminuria appeared By Oct 15 the heart had again improved but there was left palatal paresis, albuminuria, 3-6%, persisted On Oct 29, diplopia, right ptosis and left facial paralysis appeared, there was also much salivation On Oct 31, the 41st day of disease, her breathing became rapid and distressed, she was full up with secretion, her colour was poor and she developed diaphragmatic paralysis, the abdomen being fixed on respiration with exaggerated movement of the lower part of the chest The heart sounds were rapid and weak Owing to the dyspnœa, poor colour and excessive salivation she was put in the box respirator at 6 30 P M Soon afterwards she appeared more comfortable, both her colour and pulse improving Except when removed for rectal feeding she was kept constantly in the respirator till Nov 3, when abdominal breathing had definitely returned, but ptosis, diplopia, facial palsy and some salivation were still present By Nov 11 she seemed much better, the paralysis had cleared up and her heart sounds were stronger Improvement continued, she was able to sit up in bed on Nov 22, and started getting up on Dec 4 She was discharged cured on Dec 23, having been in hospital for 92 days

Diaphragmatic paralysis, though not a common sequel to diphtheria, is a serious one and often fatal, and it is difficult to treat by the usual methods Use of the box respirator as soon as this complication appears seems a good way of tiding the child over the paralytic period In this case there was immediate relief, and the child did not resent being nursed in it Such mechanical artificial respiration is reliable and easily applied The apparatus used was the box respirator supplied to all hospitals by Lord Nuffield

Of the 12 cases of postdiphtheritic paralysis treated by the Bragg-Paul pulsator recorded by C J McSweeney,[1] all of which had involvement of the diaphragm 8 recovered completely; 2 of the 4 deaths were not directly connected with the diaphragmatic paralysis In the case recorded here, as in those of McSweeney, the child appeared more comfortable when the pressure of the box respirator was reduced by opening the valves

I wish to thank Dr O M Holden, medical officer of health for Croydon, for permission to publish this case

---

[1] *Lancet,* 1936, ii 1093

Continued from previous column

32 Black J H (1933) *Brit med J* ii, 290
33 Scotson F H (1933) *Ibid* p 680
34 Meyer H W (1940) *Ann Surg* 111 370
35 Gilmour J and Saint, J H (1933) *Brit J Surg* 20, 78
36 Nicol, B M (1941) *Brit med J* ii 780
37 Zukschwerdt L and Eck, T (1931) *Dtsch Z Chir* 232, 299
38 Fallis, L S (1938) *Amer J Surg* 41 427
39 Stenbuck, J B (1927) *Ann Surg* 85 713
40 Corff M (1936) *Amer J Surg* 31 77
41 Urrutia L (1929) *Ann Surg* 90 73
42 Hinton J W (1931) *Surg Gynec Obstet* 52 778
43 Ross, A and Letourneau, C (1939) *Canad med Ass J* 41, 473
44 Schwarz E (1925) *Dtsch Z Chir* 192 239
45 Jennings, D (1940) *Lancet* i 395

Reviews of Books

Age Morphology of Primary Tubercles

HENRY C. SWEANY, M.D., medical director of research, Chicago Tuberculosis Sanitarium. London: Baillière, Tindall and Cox. Pp. 265. 27*s.* 6*d.*

IN the acute exanthemata, lobar pneumonia and many other diseases, evolution of the lesion follows a time sequence. Dr Sweany attempts to correlate in a similar way the age of the lesion with its morphology in the primary focus of tuberculosis. He suggests, among other analogies, that just as a geologist estimates the age of rocks by studying their strata, so the morbid anatomist should be able to reconstruct the sequence of events from the minute details of the pathological lesion. Even in the days of Galen lung stones were recognised as old lesions. Laennec related some of them to tuberculosis and distinguished between "bony" and "chalky" concretions; bony tissue forms in old lesions between the capsule and the calcified core. Dr Sweany describes three stages through which a primary focus passes if it heals: an evolutionary phase, a period of maturation, and finally a stage of retrogression. The first, a pneumonia in miniature, begins with a monocyte reaction and ends with caseation; during the second, the limiting capsule is formed of collagenous fibres and calcium deposition begins; in the third stage fibro-osteoid tissue, bone and marrow are laid down. With these "geological strata" for his material Dr Sweany has made a careful and elaborate microscopical study of primary foci, identified by post-mortem radiograms, and has expressed his results by a numerical assessment which may be likened to a system of marks. Though he claims that a numerical method of this kind helps to eliminate the personal factor, its workings are not always easy to follow. Using it, however, he has investigated 27 fatal cases infected before the age of seven, most of the patients having shown clear-cut infections in infancy. Arranged in age sequence, beginning with the shortest age interval between infection and death, and going on to the longest, the records range from that of a child of 7 to a man of 51. Having applied his numerical method to fifteen different qualities of the tubercle Dr Sweany uses it for various other lesions including a calcified group of hæmatogenous "reinfects" in the spleen and liver. He estimates that these had been deposited during the hæmatogenous phase of the primary infections, most of them following the primary lesions within a few weeks or months and having approximately the same age appearance. There was, however, one notable difference in that typical bone was rarely found in spleen tubercles. The book is largely composed of case-records, and there are photographs of primary foci and post-mortem radiograms which must be almost unique. He has made a monumental study of more than 900 such radiograms.

Jameson and Parkinson's Synopsis of Hygiene

(7th ed.) Editor G. S. PARKINSON, M.R.C.S., D.P.H., acting dean and director of public health department, London School of Hygiene and Tropical Medicine. London: J. and A. Churchill. Pp. 712. 25*s.*

THE first edition of this standard work appeared in 1920 and there is nothing else just like it. In this edition Professor Parkinson has not been able to draw on the collaboration of Sir Wilson Jameson (whose energies must be fully occupied in other directions) though it is still easy to detect his influence and inspiration. It is difficult to write a successful synopsis avowedly for students but to be read by many whose trials are no longer vested in examinations. Today, as the preface says, a new chapter is being written in the public health history of these islands; and a fascinating chapter it is, filled with experiments, many of which will influence postwar policy, though some must be ephemeral. Since it is as yet difficult to estimate how much will survive, the aim in this new edition has been to describe the outlook and technique of the immediate prewar period, except where these have been modified by advance in basic scientific knowledge. There is, however, a brief account of administrative measures arising from emergency, and references to fumigation of aircraft, protection against vermin, and disinfestation; there is a note, too, on recent regulations governing the lighting of factories. The statistical material has been brought up to date; immunisation against diphtheria and whooping-cough are discussed, and there are references to trichiniasis, leptospirosis, and the repercussions on public health administration of the effect of sulphonamides in cerebrospinal fever, gonorrhœa and puerperal infections. The approach which the book makes to the conception of social medicine as distinct from preventive medicine gives the student a new and salutary appreciation of problems which will confront him in his later work.

Medical Societies

ROYAL SOCIETY OF MEDICINE

AT a meeting of the section of Neurology held on Feb. 19 a discussion on

Cerebral Œdema

was opened by Dr J. G. GREENFIELD, who emphasised the difficulty of determining the criteria from which the presence of œdema can be established. There are, he considers, no real differences between cerebral œdema and the brain swelling of German literature. The chemical method by which the water content of brain is analysed provides an accurate method of determining œdema, provided that the amount of associated congestion is allowed for by determining the iron content of the tissue. The histological changes include swelling of astrocytes, irregular swelling of myelin sheaths, beading and end-bulb formation of axons. Œdema is limited to white matter, but there is remarkable sparing of long commissural fibres such as those in the internal capsule. Important causes of cerebral œdema are cerebral ischæmia, cerebral abscess, cerebral tumour and cerebral contusion. With regard to fatal cases of head injury there is little evidence of generalised cerebral œdema, and recent studies have failed to provide evidence that it is ever a cause of death. Nor is there any obvious sound reason for the much used dehydration treatment. Dr Greenfield also referred to less common causes of œdema, and to the passage of fluid from the ventricles into the cerebral white matter in cases of cerebral œdema.

Major W. RITCHIE RUSSELL considered cerebral œdema from the clinical point of view. The slight general swelling of the brain which may follow head injury probably, he said, causes an increase of intracranial pressure, but there is no satisfactory evidence to support the common belief that this is a cause of disorders of consciousness. The bradycardia during recovery from severe head injury may be associated with normal intracranial pressure and full consciousness. In conditions such as cerebral abscess or obstruction to a cerebral vein there is evidence to support the view that associated œdema causes paralysis of local cerebral function. Intravenous hypertonic solutions reduce intracranial pressure for a short time but they are likely to cause more shrinkage of relatively normal brain than of the œdematous area. There is a danger lest the diagnosis of cerebral œdema should be used to conceal our ignorance of the cause of certain cerebral states.

Dr J. HAMILTON PATERSON reported the effects on the lumbar cerebrospinal fluid pressure of administering 50 to 100 c.cm. of 50% sucrose by the intravenous route. He made use of a method by which the spinal fluid pressure after lumbar puncture was recorded continuously for several hours. In eight subjects with normal pressure a reduction of pressure was demonstrated in only four subjects and the maximum reduction was 30 mm. of water which continued for only one hour. In eight subjects with raised pressure the intravenous sucrose caused no change in pressure in three cases. The maximum reduction observed was a fall of 50 mm. which lasted for less than 50 minutes, and thereafter the pressure rose above the original figure.

During the discussion which followed members emphasised the difficulty of interpreting the intracranial state from the spinal fluid pressure. Speakers also agreed that prolonged post-traumatic bradycardia is not due to increased intracranial pressure. The difficulties of recognising œdema were also emphasised and the need for further research was stressed.

THE LANCET

LONDON SATURDAY, FEBRUARY 28, 1942

RUSSIAN INTERCHANGE

WE look forward when the war is over to enjoying happy relations with the Russians and to that vigorous exchange of scientific and artistic thought which is the best part of comradeship, whether between men or nations In the meantime we are anxious to contribute in every way we can to the strength of their arms and their defences, and for the medical profession the course is plain we would like to put at their disposal whatever information may be useful, and to find whatever equipment they need

Something has already been done in both directions by the Anglo-Soviet Medical Committee, the appeal made by Sir ALFRED WEBB-JOHNSON, president of the committee, for surgical instruments has met with a good response which he acknowledges on another page, instruments worth about £3000 have reached him and less than 10% of these required repair Those in perfect condition were greased and forwarded at once, while those needing overhaul or replating are being put quickly in order A subcommittee dealing with medical supplies have been advising Mme MAISKY, wife of the Soviet Ambassador, on the purchase of surgical instruments, X-ray sets, autoclaves and other equipment, and during the past three months 70 large cases of instruments, some weighing a quarter of a ton, have been dispatched In addition, Sir PHILIP MANSON-BAHR and Mr G F HOME are compiling a book for the committee, probably to be called "Reviews of British War Medicine," consisting of articles by recognised authorities This is being translated into Russian by doctors who have volunteered for the task and will be printed as quickly as possible and sent to Russia through the Soviet Embassy If this volume is a success it is hoped to make it the first of a series References and illustrations will be few, the aim being to produce a compact, informative and inexpensive book before the expected spring offensive begins The object is not to try to teach the Russians anything (for they probably know far more about war medicine by this time than we do) but to say, in effect, "This is the way we do it What do you think of it? And will you tell us about your own findings?" Thus the series may lead to an exchange of medical opinion which the profession in this country would greatly welcome There are many things we should like to learn For example, what standards do the Russians use in selection of troops? What is their age-limit for air pilots? Are they better provided than we are with rehabilitation and vocational training centres? Dr S GIRGOLOV, in *Soviet War News*, the bulletin issued by the Soviet Embassy, says that for frostbite they use rapid heating of the affected part and physiotherapy, including ultrashort waves, and remove damaged tissues early, but he gives no details He also says they are using closed plaster more and more, and are employing plasma for transfusion on a large scale Have they had much gas gangrene? Have they used local sulphonamides widely and has their experience been the same as ours? How do they send their blood to the front line? How are they treating burns? Are they using local anæsthesia for operations? Mr ANTHONY EDEN has already undertaken to try to arrange an exchange of information about typhus[1]

Many more questions spring to the mind on which shared experience would doubtless throw light, but apart from the written word what we should all like is a visit from a deputation of our Russian colleagues and the chance to exchange views and opinions and to establish a closer understanding which will help to found a lasting friendship

PLANNED TREATMENT OF THYROTOXICOSIS

THE call to duty in acute disease is dramatic and rarely goes unanswered, but the challenge of chronic disease—far more important from the national standpoint—leaves us comparatively unstirred LAYTON[2] has illustrated this dismal fact from his experience with middle-ear infections, but thyrotoxicosis provides as good an example Here there is a great opportunity for close collaboration between general practitioner, physician and surgeon, but how often is this achieved? The Registrar-General's figures for deaths from thyrotoxicosis rose persistently during the twenty years, up to 1936[3] yet during the same period the fatality-rate among patients receiving skilled treatment in hospital fell to a negligible figure Thus in a series of 1000 operations for toxic goitre done in 1934–39 KEYNES[4] had but 13 postoperative deaths His analysis takes no account of the more remote postoperative complications but these would not raise the figure significantly This is an example of what can be achieved in a special clinic by a skilled team But the benefits then received by the few are only now beginning to be made available to the many, and, as LAHEY[5] says, where thyrotoxicosis is treated casually by individuals the mortality will remain distressingly high It is largely the realisation of the importance of planned treatment which has brought down the mortality since 1936—from 1699 then to 1568 in 1938, to 1380 in 1939 and 1186 in 1940

Much depends on the practitioner, who must diagnose thyrotoxicosis at an early stage, this may be difficult in masked forms, but in most cases the clinical picture is obvious Once the diagnosis is made the patient should be referred to a hospital immediately Too often the doctor temporises because he knows that the disease does not immediately threaten life He knows too that iodine will afford relief, he prescribes it and persists with it for months It is this delay, more than the iodine itself, which does harm To give iodine without any other therapy while the patient continues at work, exposed to all her usual physical and psychic stresses, is thoroughly bad treatment In the long run these circumstances will aggravate the disease in spite of iodine Too often only when it has become very severe, or cardiac complications have developed, is the patient referred to hospital It will then be a question of getting her well in spite of the doctor's treatment About a third of the patients reaching hospital have had ineffectual, irregular or lengthy iodine therapy Many others develop some complication, suddenly become worse and die without ever reaching hospital **DUNHILL**[5] taught that the clinical course of the disease falls into three stages early thyrotoxicosis, established thyrotoxicosis, and thyrotoxicosis with complications The earlier the stage at which the patient attends hospital the greater the likelihood of a satisfactory result, conversely, even in the most skilled hands, the mortality is appreciable in the final stage The best incentive to the practitioner to send his patient to hospital in the first stage would be the assurance that treatment would be undertaken by physicians and surgeons specially interested in the disease and working in collaboration, in London and Edinburgh, for example, he can already be sure of this Moreover the nursing staff of the ward to which the patient is admitted should understand the special psychological, cardiac and nutritional problems involved We have much to learn from the Americans about such organised hospital treatment Ideally every patient should be admitted for a short period of investigation, away from domestic and other stresses The physician and surgeon, working together, should assess the stage and severity of the disease, and this can always be done more accurately if there has been no previous iodine therapy Should thyroidectomy be deemed unnecessary, the patient can be referred to her doctor with appropriate advice, occasional attendances at hospital, however, will still be required so that the plan of treatment can be revised if progress is not satisfactory

---

[1] *Lancet* 1942 i 213
[2] Layton T B *Lancet* 1941, ii 587
[3] McEwan P *Brit med J* 1938 i 1037
[4] Linnell J W and Keynes, G *Ibid* 1939 i 764
[5] Lahey, F H *New Engl J Med* 1935, 213, 475

If iodine is given it should only be on the advice of the physician and surgeon supervising the case Iodine is especially valuable in preparing patients for operation, because it produces an artificial remission during which thyroidectomy is relatively safe In a crisis it ranks in value with the specific drugs—the confused and restless patient given iodine for the first time may in a few days become rational and comparatively quiet It is over such cases that the physician sighs with relief to learn that no iodine has been given previously, for if crisis threatens in a patient who has already had much iodine the position is desperate Intravenous iodine is often said to have special virtue in the treatment of thyroid crisis, but in view of the extreme rapidity with which iodine is absorbed from the alimentary tract[6] the intravenous route can have no advantage except in the rare cases with severe vomiting and diarrhœa The form in which iodine is given matters little **COHN**[7] demonstrated that Lugol's solution has no therapeutic advantage over potassium iodide **WASS**[8] has recently suggested that di-iodotyrosine is superior to inorganic iodine in some cases, but this is not in accord with other evidence Neither the form of the iodine nor the route of administration being of much moment, it remains to decide when to give it As a sole method of treating established thyrotoxicosis iodine is of little value, but it has a place in the treatment of young women in whom the disease is of recent onset and seems unlikely to cause physical or psychical exhaustion In some of these patients the disease may subside after a comparatively short course, but they must be watched closely and thyroidectomy should not be delayed too long if they do not improve The body-weight is a good guide to the patient's progress, and estimation of the severity of the disease by its clinical effect on the patient rather than by the metabolic rate has much to recommend it Such expectant treatment, with or without iodine, is best reserved for early and mild thyrotoxicosis in young women—it has no place in cases occurring in later life Even a trifling degree of thyrotoxicosis in the middle-aged patient with a nodular goitre calls for thyroidectomy, because of the risk of cardiac complications **SMITH**[9] reminds us that associated heart disease makes the occasion still more urgent Auricular fibrillation and failure are naturally more likely to arise in hearts subjected to the double strain of thyrotoxicosis and organic disease

STUDENTS IN UNIFORM?

YOUNG men are rightly touchy when they fancy themselves suspected of evading military service, and most are their own sternest critics in this direction In the last war medical students were spared the ordeal of examining their motives because they were called up as soon as they were of an age to serve—a policy which led to a serious falling off in the numbers qualifying In this war, since April, 1941, all medical and dental students have been reserved from the date of their acceptance by a recognised medical school, each school having to keep its admissions within an allotted quota This throws the responsibility for choosing between military service and a reserved occupation on the senior schoolboy or his parents Many of the more enterprising boys and more public-spirited parents no doubt take the short-term view that immediate action in a fighting service is more valuable to the country than a promise of action as a doctor several years hence Fortunately for the post-war profession this view has not so far led to a fall either in numbers or quality of the applicants for at any rate the larger medical schools, but a peripatetic correspondent suggests that the exempted student's work suffers from the constant nagging of his conscience and of white-feather friends The difficulty would, he thinks, be overcome if all medical students were called up on reaching military age and then sent back in uniform to complete their medical training The uniform itself is but a minor part of the proposal, though it should offer better protection from white feathers than the badge for the buttonhole which some medical schools now supply For the newly qualified man there is already no problem the Central Medical War Committee sends him where it thinks him most useful—and our correspondent is urging that it would set the student's mind at rest, and ensure our profession a fair share of good men, if students were equally bereft of choice, once they were well along the road to qualification By the time they reach 18½, the calling-up age, most medical students have passed their premedical examinations and entered on the preclinical years They are then no longer entitled to be extravagant with their persons, and the country has a fair claim on their future service as doctors Certainly the young man who has gone from school to medicine and sees every prospect of qualifying need feel no prickings of conscience if he decides to keep on with his studies, for there are no cushy jobs these days

---

[5] Dunhill, T P *St Bart's Hosp Rep* 1934 67, 181

[6] Elmer, A W Iodine Metabolism and Thyroid Function, London, 1938

[7] Cohn, B N E *Arch intern Med* 1932, 49, 950

[8] Wass, S H *Lancet*, 1941, ii, 34

[9] Smith, S A *Med J Aust* 1941, ii, 311

Annotations

CHEMICAL TESTS FOR VITAMIN DEFICIENCIES

AFTER chemical identification of each vitamin the next step has always been to devise a test to estimate it in body fluids, with the object of ascertaining the body's reserves (or the nutritional status, level of nutrition, or degree of saturation as it has been varyingly styled) Vitamin C was the pioneer Patients with scurvy were shown to be so unsaturated that they need about a week of test-dosing with the vitamin before they allow excess to overflow in their urine, whereas subjects who have received ample vitamin C, and whose reserves are therefore full, respond by excretion on the first day of the same dosing, intermediate responses denote intermediate levels [1] The application of this test led to several significant findings—for example, scorbutic or near-scorbutic levels are common in patients kept on "gastric" diets without supplements of vitamin C,[2] and in infectious diseases, especially phthisis, the needs are increased so that the tissue reserves and urinary responses are diminished [3] Lately urinary excretion tests, or similar methods using blood, have been employed for social surveys For vitamin B_1 a similar procedure is available [4] Patients with beriberi excrete little or no vitamin B_1, and those with good intakes of the vitamin excrete more than those with mediocre intake Test-dosing again gives the most reliable information and has been useful in confirming that a conditioned deficiency (by which is meant a faulty absorption or utilisation of the vitamin) is the cause of polyneuritis associated with pregnancy, alcoholism or gastro-intestinal obstruction A test of the same type has been worked out for the anti-pellagra factor, nicotinic amide [5, 5a] Cambridge workers have recently emphasised that nicotinic amide in the diet is partly excreted as trigonelline [6]; this substance is present in foodstuffs but when taken by mouth is biologically inactive Hence two procedures can be used in the test either the intake of trigonelline must be restricted by giving a specially controlled diet, in which case the excretion of trigonelline plus nicotine amide can be estimated, or, if the diet is unrestricted, the nicotinic amide alone must be estimated

A different type of procedure depends on detecting a change in chemical function associated with the deficiency It is known that in deficiency of B_1 there are abnormalities in the intermediate metabolism of carbohydrates, and as long ago as 1922 it was shown that lactic acid is present in excessive amounts in the tissues of animals deprived of vitamin B_1 [6] Dogs or men with beriberi have persistently high lactic acid in their blood after exercise, whereas normal controls are able to dispose more rapidly of the lactic acid which accumulates [7], in vitro, vitamin B_1 added with lactic acid to tissue preparations from deficient animals aids in restoring the oxidative process [7a] Attention later shifted to pyruvic acid, the importance of which for intermediate metabolism of carbohydrates had been indicated by the work of Meyerhof and others From the now classical experiments of K Lohmann and P Schuster [8] we know that vitamin B_1 functions in the organism in the form of its pyrophosphate ester as a co-enzyme (co-carboxylase) needed in the breakdown of pyruvic acid Experiments on animals and clinical tests show that there is excessive pyruvic acid in the blood of animals or humans with beriberi, and that the abnormality disappears on cure [9] Examination of the blood for pyruvic acid is thus a method of confirming the presence of active avitaminosis B_1, a limitation is that the pyruvic acid may not be raised in the early, or subclinical, stages of the deficiency To detect minor degrees of deficiency, and thus to assess the level of nutrition loading tests were accordingly suggested by Harris and his colleagues In rats it was found that loading with lactic acid and estimation of the abnormal excretion of bisulphite-binding substances (mostly pyruvic acid) in the urine served to reveal the extent of a latent deficiency, for men, however, lactic acid was not a suitable substance for the test dose and in its place glucose or other carbohydrate metabolites were proposed [10], these findings were confirmed by McCollum and others in America [10a] A similar procedure is that used by Elsom and his colleagues, who dose the patient with glucose and examine the blood-pyruvate curve [11] In normal subjects there is only a transient rise in the pyruvate figure whereas in deficiency the fall is slower Ellis Wilson's investigation[12] of the blood of normal children of the hospital class is reassuring as showing that the blood pyruvate was not raised above the figure found in a similar class of children studied in America, which means that any advanced deficiency of vitamin B_1 was at any rate absent It does not necessarily mean that all the children were having sufficient vitamin B_1 for health, for tests in America and elsewhere have often proved that apparently normal children show improved gains in weight and height when additional vitamin B_1 is added to an average diet.[13] Loading tests might be expected to indicate the presence of these minor departures from normality, or of latent deficiency

RESUSCITATION IN SHOCK

No effective measure of degree of shock has yet been devised Dr R T Grant, speaking at a joint meeting of the sections of medicine and surgery of the Royal Society of Medicine on Jan 27, pointed out that this lack of a criterion makes it difficult to assess the value of various methods of treatment It is often uncertain he said, whether the patient has lost much blood or little, and difficult to tell what part nervous influences are playing in the collapse Yet in assessing the need for a transfusion he places more weight on the severity of the injury and the blood loss than on the state of the blood-pressure, which may be normal, and associated with a normal pulse rate and even with a good colour, in spite of much loss of blood In patients whose blood-pressure has fallen, return to a normal systolic pressure, and its maintenance, can be taken as the chief indication that an adequate volume of blood has been transfused The rise of pressure accompanying a rapid transfusion is not always maintained, he has found, whereas a slower injection makes for a more gradual but better sustained rise He prefers to transfuse blood rather than plasma, especially when giving a large transfusion and in this Mr Vaughan Hudson agreed with him, though he finds it convenient in war-time to reserve and die without ever reaching hospital **Dunhill**[5] taught that the clinical course of the disease falls into three stages early thyrotoxicosis, established thyrotoxicosis, and thyrotoxicosis with complications The earlier the stage at which the patient attends hospital the greater the likelihood of a satisfactory result, conversely, even in the most skilled hands, the mortality is appreciable in the final stage The best incentive to the practitioner to send his patient to hospital in the first stage would be the assurance that treatment would be undertaken by physicians and surgeons specially interested in the disease and working in collaboration, in London and Edinburgh, for example, he can already be sure of this Moreover the nursing staff of the ward to which the patient is admitted should understand the special psychological, cardiac and nutritional problems involved We have much to learn from the Americans about such organised hospital treatment Ideally every patient should be admitted for a short period of investigation, away from domestic and other stresses The physician and surgeon, working together, should assess the stage and severity of the disease, and this can always be done more accurately if there has been no previous iodine therapy Should thyroidectomy be deemed unnecessary, the patient can be referred to her doctor with appropriate advice, occasional attendances at hospital, however, will still be required so that the plan of treatment can be revised if progress is not satisfactory

---

[1] Harris, L J and Ray, S N *Lancet* 1935 i 71 Harris, *Ibid* 1940, ii, 259

[2] Harris Abbasy M A Yudkin J and Kelly S *Ibid* 1936, 1488 Archer H E and Graham, G *Ibid* 1936, ii, 364

[3] Harris Passmore R and Pagel W *Ibid*, 1937, ii 183, Abbasy Harris and Ellman P *Ibid* p 181

[4] Harris and Leong P C *Ibid* 1936 i 886, Harris Leong and Ungley C C *Ibid* 1938 i, 539 Harris and Wang Y L *Biochem. J* 1939 33 1356, *Ibid* 1941 35, 1068, Wang and Yudkin *Ibid*, 1940 34, 343

[5] Harris and Raymond W D *Ibid*, 1939 33 2037, 5a Kodicek E and Wang *Nature Lond* 1941 148 23

[6] Collazo, J A *Biochem Z* 1922 134 194 *Ibid*, 1923 136, 278 Bickel A *Ibid* 1924 146 493, *Ibid* 1925 166 251, Juno Y *J Orient Med* 1926 5, 29, Pugliese A *Arch Sci biol*, Napoli, 1928, 12 251, *Arch ital. Biol* 1929, 81 91

[7] Inawashiro, R and Hayasaka E *Tohoku J exp Med* 1928, 12 1, Hayasaka *Ibid* 1930 14 487 7a. Gavrilescu N and Peters R A *Biochem J* 1931 25 1397, 2150, *J Physiol* 1931 72, 32 P Meiklejohn A P Passmore R and Peters *Biochem J* 1932 26, 1872.

[8] *Naturwissenschaften*, 1937, 25, 26 *Biochem. Z* 1937 294 188

[9] Thomson R H and Johnson R E *Chem Ind* 1934 53 1024 Platt B S and Lu, G D *Proc. physiol Sec. Conf Chin med Ass* 1935

[10] Banerji G G and Harris *Biochem J* 1939, 33 1346 Harris *Ann Rep chem Soc* 1940 37, 387 10a. Shills M. E Day H G and McCollum E V *J biol Chem* 1941 139 145 Harper H A and Deuel H J *Ibid*. 1941 137 233

[11] Elsom E O S, Lukens F D H and Montgomery, E H *J clin Invest* 1940 19 153

[12] *Lancet*, 1942 i 199

[13] Summerfeldt, P *Amer J Dis Child* 1932, 43 284 Joslin C L and Helms, S T *Arch Pediat* 1937 54 533

If iodine is given it should only be on the advice of the physician and surgeon supervising the case Iodine is especially valuable in preparing patients for operation, because it produces an artificial remission during which thyroidectomy is relatively safe In a crisis it ranks in value with the specific drugs—the confused and restless patient given iodine for the first time may in a few days become rational and comparatively quiet It is over such cases that the physician sighs with relief to learn that no iodine has been given previously, for if crisis threatens in a patient who has already had much iodine the position is desperate Intravenous iodine is often said to have special virtue in the treatment of thyroid crisis, but in view of the extreme rapidity with which iodine is absorbed from the alimentary tract[6] the intravenous route can have no advantage except in the rare cases with severe vomiting and diarrhœa The form in which iodine is given matters little **Cohn**[7] demonstrated that Lugol's solution has no therapeutic advantage over potassium iodide **Wass**[8] has recently suggested that di-iodotyrosine is superior to inorganic iodine in some cases, but this is not in accord with other evidence Neither the form of the iodine nor the route of administration being of much moment, it remains to decide when to give it As a sole method of treating established thyrotoxicosis iodine is of little value, but it has a place in the treatment of young women in whom the disease is of recent onset and seems unlikely to cause physical or psychical exhaustion In some of these patients the disease may subside after a comparatively short course, but they must be watched closely and thyroidectomy should not be delayed too long if they do not improve The body-weight is a good guide to the patient's progress, and estimation of the severity of the disease by its clinical effect on the patient rather than by the metabolic rate has much to recommend it Such expectant treatment, with or without iodine, is best reserved for early and mild thyrotoxicosis in young women—it has no place in cases occurring in later life Even a trifling degree of thyrotoxicosis in the middle-aged patient with a nodular goitre calls for thyroidectomy, because of the risk of cardiac complications **Smith**[9] reminds us that associated heart disease makes the occasion still more urgent Auricular fibrillation and failure are naturally more likely to arise in hearts subjected to the double strain of thyrotoxicosis and organic disease

STUDENTS IN UNIFORM?

Young men are rightly touchy when they fancy themselves suspected of evading military service, and most are their own sternest critics in this direction In the last war medical students were spared the ordeal of examining their motives because they were called up as soon as they were of an age to serve—a policy which led to a serious falling off in the numbers qualifying In this war, since April, 1941, all medical and dental students have been reserved from the date of their acceptance by a recognised medical school, each school having to keep its admissions within an allotted quota This throws the responsibility for choosing between military service and a reserved occupation on the senior schoolboy or his parents Many of the more enterprising boys and more public-spirited parents no doubt take the short-term view that immediate action in a fighting service is more valuable to the country than a promise of action as a doctor several years hence Fortunately for the post-war profession this view has not so far led to a fall either in numbers or quality of the applicants for at any rate the larger medical schools, but a peripatetic correspondent suggests that the exempted student's work suffers from the constant nagging of his conscience and of white-feather friends The difficulty would, he thinks, be overcome if all medical students were called up on reaching military age and then sent back in uniform to complete their medical training The uniform itself is but a minor part of the proposal, though it should offer better protection from white feathers than the badge for the buttonhole which some medical schools now supply For the newly qualified man there is already no problem the Central Medical War Committee sends him where it thinks him most useful—and our correspondent is urging that it would set the student's mind at rest, and ensure our profession a fair share of good men, if students were equally bereft of choice, once they were well along the road to qualification By the time they reach 18½, the calling-up age, most medical students have passed their premedical examinations and entered on the preclinical years They are then no longer entitled to be extravagant with their persons, and the country has a fair claim on their future service as doctors Certainly the young man who has gone from school to medicine and sees every prospect of qualifying need feel no prickings of conscience if he decides to keep on with his studies, for there are no cushy jobs these days

---

[5] Dunhill, T P *St Bart s Hosp Rep* 1934, **67** 184

[6] Elmer, A W Iodine Metabolism and Thyroid Function, London 1938

[7] Cohn, B N E *Arch intern Med* 1932, **49**, 950

[8] Wass, S H *Lancet*, 1941, ii, 34

[9] Smith, S A *Med J Aust* 1941, ii, 311

Annotations

CHEMICAL TESTS FOR VITAMIN DEFICIENCIES

After chemical identification of each vitamin the next step has always been to devise a test to estimate it in body fluids, with the object of ascertaining the body's reserves (or the nutritional status, level of nutrition, or degree of saturation as it has been varyingly styled) Vitamin C was the pioneer Patients with scurvy were shown to be so unsaturated that they need about a week of test-dosing with the vitamin before they allow excess to overflow in their urine, whereas subjects who have received ample vitamin C, and whose reserves are therefore full, respond by excretion on the first day of the same dosing, intermediate responses denote intermediate levels[1] The application of this test led to several significant findings—for example, scorbutic or near scorbutic levels are common in patients kept on "gastric" diets without supplements of vitamin C,[2] and in infectious diseases, especially phthisis, the needs are increased so that the tissue reserves and urinary responses are diminished[3] Lately urinary excretion tests, or similar methods using blood, have been employed for social surveys For vitamin B_1 a similar procedure is available[4] Patients with beriberi excrete little or no vitamin B_1, and those with good intakes of the vitamin excrete more than those with mediocre intake Test-dosing again gives the most reliable information and has been useful in confirming that a conditioned deficiency (by which is meant a faulty absorption or utilisation of the vitamin) is the cause of polyneuritis associated with pregnancy, alcoholism or gastro-intestinal obstruction A test of the same type has been worked out for the anti-pellagra factor, nicotinic amide[5, 5a] Cambridge workers have recently emphasised that nicotinic amide in the diet is partly excreted as trigonelline[6], this substance is present in foodstuffs, but when taken by mouth is biologically inactive Hence two procedures can be used in the test either the intake of trigonelline must be restricted by giving a specially controlled diet, in which case the excretion of trigonelline plus nicotine amide can be estimated, or, if the diet is unrestricted, the nicotinic amide alone must be estimated

A different type of procedure depends on detecting a change in chemical function associated with the deficiency It is known that in deficiency of B_1 there are abnormalities in the intermediate metabolism of carbohydrates, and as long ago as 1922 it was shown that lactic acid is present in excessive amounts in the tissues of animals deprived of vitamin B_1[6] Dogs or men with beriberi have persistently high lactic acid in their blood after exercise, whereas normal controls are able to dispose more rapidly of the lactic acid which accumulates[7], in vitro, vitamin B_1 added with lactic acid to tissue preparations from deficient animals aids in restoring the oxidative process[7a] Attention later shifted to pyruvic acid, the importance of which for intermediate metabolism of carbohydrates had been indicated by the work of Meyerhof and others From the now classical experiments of K Lohmann and P Schuster[8] we know that vitamin B_1 functions in the organism in the form of its pyrophosphate ester as a co-enzyme (co-carboxylase) needed in the breakdown of pyruvic acid Experiments on animals and clinical tests show that there is excessive pyruvic acid in the blood of animals or humans with beriberi, and that the abnormality disappears on cure[9] Examination of the blood for pyruvic acid is thus a method of confirming the presence of active avitaminosis B_1, a limitation is that the pyruvic acid may not be raised in the early, or subclinical, stages of the deficiency To detect minor degrees of deficiency, and thus to assess the level of nutrition, loading tests were accordingly suggested by Harris and his colleagues In rats it was found that loading with lactic acid and estimation of the abnormal excretion of bisulphite-binding substances (mostly pyruvic acid) in the urine served to reveal the extent of a latent deficiency, for men, however, lactic acid was not a suitable substance for the test dose and in its place glucose or other carbohydrate metabolites were proposed[10], these findings were confirmed by McCollum and others in America[10a] A similar procedure is that used by Elsom and his colleagues, who dose the patient with glucose and examine the blood-pyruvate curve[11] In normal subjects there is only a transient rise in the pyruvate figure whereas in deficiency the fall is slower Ellis Wilson's investigation[12] of the blood of normal children of the hospital class is reassuring as showing that the blood pyruvate was not raised above the figure found in a similar class of children studied in America, which means that any advanced deficiency of vitamin B_1 was at any rate absent It does not necessarily mean that all the children were having sufficient vitamin B_1 for health, for tests in America and elsewhere have often proved that apparently normal children show improved gains in weight and height when additional vitamin B_1 is added to an average diet[13] Loading tests might be expected to indicate the presence of these minor departures from normality, or of latent deficiency

RESUSCITATION IN SHOCK

No effective measure of degree of shock has yet been devised Dr R T Grant, speaking at a joint meeting of the sections of medicine and surgery of the Royal Society of Medicine on Jan 27, pointed out that this lack of a criterion makes it difficult to assess the value of various methods of treatment It is often uncertain, he said, whether the patient has lost much blood or little, and difficult to tell what part nervous influences are playing in the collapse Yet in assessing the need for a transfusion he places more weight on the severity of the injury and the blood loss than on the state of the blood-pressure, which may be normal, and associated with a normal pulse-rate and even with a good colour, in spite of much loss of blood In patients whose blood-pressure has fallen, return to a normal systolic pressure, and its maintenance, can be taken as the chief indication that an adequate volume of blood has been transfused The rise of pressure accompanying a rapid transfusion is not always maintained, he has found, whereas a slower injection makes for a more gradual but better sustained rise He prefers to transfuse blood rather than plasma, especially when giving a large transfusion, and in this Mr Vaughan Hudson agreed with him though he finds it convenient in war-time to reserve blood for exsanguinated patients and to use the more practicable plasma for the rest The effective treatment of the wound—by removal of dead and dying tissue, relief of tension, and immobilisation—helps to avert further shock For patients needing immediate surgery he orders a plasma drip in the resuscitation ward, in the anæsthetic room a small dose of 'Pentothal' is injected into the drip tubing, and the skin is prepared with the patient under gas and oxygen In the recovery ward the patient's fluid intake and output are carefully supervised This routine is also followed with burned patients, the plasma drip being established by cutting down through burned tissue if necessary Dr M D Nosworthy considered that it is always better to start a transfusion with plasma even if blood is ultimately to be used, because plasma runs much more readily into the veins of the shocked patient, and Dr John McMichael thought it a mistake to dismantle the apparatus after the original transfusion has been given, it should be used to maintain a drip while the operation is being done The value of morphine in shock was also discussed Dr Grant said that though he has not seen bad results follow gr ¼, the alkaloid is not well tolerated by some patients, and other drugs, such as choral or bromide by mouth or rectum, might be used more freely Dr Nosworthy thought that morphine has no specific antishock value, and that it should not be given when the patient is in no pain because it is likely to increase any anoxia already present Some frail patients admitted moribund to hospital, having had as much as gr 1 of morphine, have really died of an overdose At some first-aid posts, it seems, the standard dose is gr ½, which may be too much for many patients Dr Nosworthy believes that adequate sedation without respiratory depression can be achieved by giving a much smaller dose of morphine together with scopolamine—a drug which in contrast to morphia helps to allay fear Restlessness unassociated with pain is better controlled, he thinks, by intravenous paraldehyde than by morphine Mr E G Slesinger, however, was not willing to hear morphine disparaged Whatever may be the case with civilian casualties, most of whom reached hospital early, Service casualties are, he said, almost invariably in pain by the time they reach a casualty clearing station, and they need morphine, great pain can be dramatically relieved by giving morphine intravenously

---

[1] Harris L J and Ray, S N *Lancet* 1935, i, 71 Harris, *Ibid*, 1940, ii 259

[2] Harris, Abbasy, M A, Yudkin J and Kelly S *Ibid* 1936, 1488, Archer, H E and Graham G *Ibid*, 1936 ii 364

[3] Harris Passmore R and Pagel W *Ibid*, 1937 ii 183, Abbasy Harris and Ellman, P *Ibid*, p 181

[4] Harris and Leong, P C *Ibid*, 1936 i 886 Harris Leong and Ungley C C *Ibid* 1938 i, 539 Harris and Wang Y L *Biochem J* 1939, 33 1356, *Ibid*, 1941, 35, 1068 Wang and Yudkin *Ibid*, 1940, 34 343

[5] Harris and Raymond, W D *Ibid* 1939 33 2037, 5a Kodicek, E and Wang *Nature Lond* 1941 148, 23

[6] Collazo J A *Biochem Z* 1922, 134 194 *Ibid*, 1923, 136 278, Bickel A *Ibid*, 1924 146 493, *Ibid*, 1925 166 251, Juno Y *J Orient Med* 1926, 5 29, Pugliese A *Arch Sci biol*, *Napoli*, 1928, 12, 251 *Arch ital Biol* 1929 81 91

[7] Inawashiro R and Hayasaka, E *Tohoku J exp Med* 1928, 12 1 Hayasaka, *Ibid* 1930 14 487, 7a Gavrilescu N and Peters R A *Biochem J* 1931 25 1397, 2150 *J Physiol* 1931 72, 32 P Meiklejohn, A P Passmore, R and Peters, *Biochem J* 1932 26, 1872

[8] *Naturwissenschaften* 1937, 25, 26, *Biochem Z* 1937 294 188

[9] Thomson R H and Johnson R E *Chem Ind* 1934 53 1024 Platt B S and Lu G D *Proc physiol Soc Conf Chin med Ass* 1935

[10] Banerji G G and Harris *Biochem J* 1939, 33 1346, Harris, *Ann Rep chem Soc* 1940, 37 387 10a Shills M E Day, H G and McCollum E V *J biol Chem* 1941, 139 145 Harper, H A and Deuel H J *Ibid* 1941 137 233

[11] Elsom, E O S Lukens, F D H and Montgomery, E H *J clin Invest* 1940, 19 153

[12] *Lancet*, 1942 i, 199

[13] Summerfeldt P *Amer J Dis Child* 1932 43 284 Joslin C L and Helms, S T *Arch Pediat* 1937 54 533

CHEMOTHERAPY IN SCARLET FEVER

THE precise rôle of chemotherapy in scarlet fever is uncertain F H Top and D C Young in America, having previously demonstrated the value of convalescent serum and antitoxin, investigated the effect of sulphanilamide alone in the treatment of scarlet fever [1] Their results are unexpected the duration of initial pyrexia was naturally shorter in the convalescent serum and antitoxin groups, but no other obvious therapeutic advantage could be claimed over sulphanilamide alone In this country scarlatinal antitoxin is accepted as the basis of treatment of scarlet fever, fairly general support has also been given to chemotherapy in the management of certain complications such as otitis as they arise Whether chemotherapy can prevent such complications is much more doubtful B A Peters and R V Havard,[2] E C Benn [3] and others were impressed with the results of combined treatment but advantages were not demonstrated by the experiments of J C Hogarth [4] and J O French [5] Assessment of any therapeutic agent in scarlet fever is difficult at present because of the mild character of the disease Moreover, in hospital practice there is always the possibility that incidents regarded as complications may in fact be streptococcal reinfections which the initial treatment could not be expected to influence On the whole, though it was rational to suppose that chemotherapy might prove complementary to antitoxin in treatment, no clear case has been made for the routine administration of sulphanilamide or any of the later preparations in the prevalent mild type of scarlet fever

AMONG THE LEAVES SO GREEN-O

> "Nebuchadnezzar the King of the Jews
> Suffered from new and original views
> He crawled on his hands and knees, it's said,
> With grass in his mouth and a crown on his head"

Horses and cows do so well on grass that man has often cast an envious eye at them The Food Group of the Society of Chemical Industry has gone further and thought of a plan by which we can share with these noble beasts all the pleasures of a graminivorous diet At a meeting on Feb 11, to discuss green leaves as a source of protein and other nutrients, Mr N W Pirie, whose views have already been published,[1] contended that we should make more economical use of leaf protein if we took it directly instead of in the form of beef and mutton But whereas ruminants can take the grass leaf as a whole and use a large part of the fibre as a source of energy, man is not so constituted Leaf proteins, however, can be separated by extraction and precipitation, and Mr Pirie believes the method could be applied on a large scale Grass would provide the readiest material, since it occupies more acreage than any crop in the country, and its protein content can be increased with nitrogenous manures About 30% of the whole leaf protein can be economically extracted, and the remaining residue, containing 70%, could be used for animal fodder A part of our imported meat or milk products could thus be replaced by leaf protein, and part of imported fodder by leaf residue He believed the cost of such protein would be less than that of fish, cheese, milk or meat, and estimated that 140,000 acres of grassland under intensive cultivation would provide sufficient protein to replace 1–2% of the annual national requirement Other speakers disclosed those secret and nutritive qualities of grass which cows have never questioned Prof A C Chibnall, F R S, for example, pointed out that the protein of cocksfoot grass is quite as good as that of whole milk, and better than that of white flour, which in addition to its other drawbacks is deficient in isoleucine Mr V H Booth, Ph D, laid bare the vitamin content of grass which is packed with carotene, vitamin B_1, riboflavine, nicotinic acid amide, vitamin E, vitamin K, and the grass juice factor, ascorbic acid is there too, but will not stand up to processing because of the presence of an active oxidase system Vitamin B_1 and riboflavine, however, could only be taken in sufficient quantity by eating far too much grass extract for comfort, so that the chief merit of grass as a source of vitamins is their carotene content This, it seems, is liable to diminish on storage, and Mr A F Pollard, Ph D, pointed out that the dried carrot pomace now being produced from surplus carrots by the Long Ashton Research Station, contained enough carotene to make it unnecessary for us to wring carotene from grass Professor Chibnall, while complimenting Mr Pirie on his scheme from the scientific point of view, doubted whether it could be got to work under present conditions There would be trouble about intensive cultivation of large tracts of grassland suitably situated for large scale processing, and the amount of first class protein obtainable would fill a very small corner of the national belly He thought it would be more useful to cultivate grasslands with intent to increase our supply of milk which is not only a source of first class protein but a first class food In fact, he said, what people wanted was not a new food but more bacon and eggs—which suggests that Professor Chibnall had finally jibbed at all thought of grass, even in the modified form of a Sunday joint Nobody seems to have mentioned how Mr Pirie's grass food would taste It might be very nice, but

---

[1] *J Amer med Ass* 1941, 117, 2056
[2] *Lancet*, 1937, i, 1273
[3] *Brit med J* 1939, ii, 644
[4] *Ibid*, 1937, ii, 1160
[5] *J Hyg, Camb* 1939, 39, 581

[1] *Chemistry and Industry*, 1942, 61, 45

> "A pioneer men always abuse
> Like Nebuchadnezzar the King of the Jews"

ECONOMY IN THE MUSEUM

EVEN museum specimens cannot now be preserved without an eye on both expense and the ration-book The three common methods for preserving the natural colours of organs are Jores's, Pick's and Kaiserling's, and relatively large quantities of methylated spirits and glycerin are used in all of them Potassium salts are also part of the recipe and potassium is scarce Pathologists have been forced to improvise, and unfortunately the results of their improvisation may only become obvious years later, when the specimen may be lost for good The advantage of the method devised by Wentworth[1] is not only that his solutions can still be readily made but that they have been tested for some years Wentworth suggests that the specimen to be mounted should first be fixed for three months either in formol saline or in a mixture of 40 g of sodium acetate, 100 c cm of formaldehyde (40% solution) and water to a litre It is then immersed for at least a fortnight in a 10% solution of sodium acetate to remove excess formalin, and after trimming is mounted in a 10% watery solution of sodium acetate from which the air is removed either by boiling for a minute or two or by a pump Finally sodium hydrosulphite (*not* "hypo") is added in amount equivalent to 2 5 g per kg of tissue and the lid of the jar promptly sealed As soon as it is safe the jar is rocked to diffuse the hydrosulphite Wentworth says that the natural colours of the tissue are usually restored in a few days, the restoration depending on the reducing properties of the hydrosulphite[2] He has treated several hundred specimens by this method with consistently good results

TESTS FOR SIMMONDS'S DISEASE

DESTRUCTION of the anterior lobe of the pituitary is responsible for Simmonds's syndrome Lack of trophic hormones from the pituitary causes atrophy and loss of function of the gonads, the thyroid and the suprarenal cortex, and there are disturbances in the hormonic control of carbohydrate metabolism, of growth, and probably of various other processes Objective evidence of the loss of gonad activity is easy to obtain in women if not in men, similarly the fall in basal metabolic rate gives evidence of hypothyroidism Arrest of growth and of fusion of epiphyses is obvious if the lesion occurs in childhood. But till recently we have had no reliable test of the other two basic functional disturbances those of the suprarenal cortex and of carbohydrate metabolism This gap has now been filled by two tests devised by Fraser and Smith[3]

Their test of suprarenal cortical function is based on the urinary excretion of 17-ketosteroids These substances are produced by the suprarenal cortex and can easily be estimated in the urine The amount normally deriving from the suprarenals and excreted is about 9 mg per day, though it is greatly increased in some hyperplasias, and in tumours, of the suprarenal cortex[4 5] The testes produce about 5 mg per day of similar substances which appear in the urine and give the same reaction For practical purposes these are the only two sources of 17-ketosteroids in the body Thus a man excretes 14 mg per day normally, but only 9 mg if he is castrated, only 5 mg if he has Addison's disease, and none at all if he has lost the function both of his suprarenal cortex and of his testes The usual cause of this combined dysfunction is, of course, hypopituitarism A woman excretes 9 mg per day normally, and this amount remains the same if she has her ovaries removed but falls to zero if, as a result of either Addison's disease or hypopituitarism, she loses her suprarenal cortical function Thus all patients with Simmonds's disease have absence of 17-ketosteroids from their urine, and a similar absence occurs in women with Addison's disease In addition some patients with myxœdema have reduced 17-kestosteroids in the urine The test alone is thus insufficient to distinguish Simmonds's disease from the two diseases it most closely simulates—myxœdema in either sex and Addison's disease in women

A second test used by Fraser and Smith is an insulin-tolerance test, previously studied in a wide variety of diseases[6] The patient is given intravenously a standard dose of 0 1 unit insulin per kg of body-weight, after which the blood sugar falls rapidly and then rises more slowly The fall is due to the insulin, but may be delayed by the insulin-antagonistic action of the glycotropic hormone of the pituitary In a normal patient the blood-sugar sinks to about 45 mg per 100 c cm in 20–30 min, in Addison s disease the fall is usually at the same rate In Simmonds's disease the patient has an excessive insulin sensitivity due to the lack of glycotropic hormone, and the same fall can be obtained with a third the dose of insulin In myxœdema there is insulin resistance, and the maximum fall is not reached until after 45–60 min —a delay which may possibly be related to the hypertrophy of the anterior lobe of the pituitary found in this condition The subsequent rise in the blood-sugar level in response to the hypoglycæmia is essentially due to suprarenal cortical hormone In normal patients the blood sugar rises about 70 mg per 100 c cm in 90 min from the time of the maximum fall The same happens in patients with myxœdema, though the actual time after the injection is later because the maximum fall is delayed But where there is gross insufficiency of the suprarenal cortex (as in either Addison's disease or Simmonds's disease) the response to hypoglycæmia is diminished and the blood-sugar rises only about 20 mg per 100 c cm in 90 min from the time of the maximum fall The test thus differentiates Simmonds's disease quite clearly from myxœdema, but in order to distinguish it satisfactorily from Addison's disease the dose of insulin must be reduced to a third—a modified test calling for further study

This summary is necessarily somewhat oversimplified A very low 17-ketosteroid excretion and an insulin tolerance curve of the type which occurs in Simmonds's disease may also be seen in severe liver disease or in malnutrition due to intestinal disease, these, however, are easily recognisable clinically Addison's disease in a woman may cause confusion, but clinical examination should again settle the point because in Simmonds's disease there is no pigmentation, the entire genital tract is superinvoluted, body hair is lost, symptoms of hypothyroidism appear, and there are other evidences of a lesion destroying the anterior pituitary The differential diagnosis of anorexia nervosa from Simmonds s disease seems to present difficulties in other countries,[7] but these two tests gave a clear answer in all the cases studied by Fraser and Smith Indeed, unless their two tests give the characteristic responses a diagnosis of Simmonds's disease cannot be accepted

---

[1] Wentworth, J E *J Path Bact* January, 1942 p 137

[2] The chemical formula of this substance is $Na_2S_2O_4$ It is a powerful reducing agent used by dyers, bleachers and sugar refiners Its proper name is sodium hyposulphite, but as this name has been quite improperly appropriated by photographers and others for $Na_2S_2O_3$, sodium thiosulphate it is convenient to use the trade name of 'hydrosulphite although it has no chemical justification whatever

[3] Fraser R and Smith P H *Quart J Med* 1941, 10 297

[4] Fraser, Forbes A P Albright F Sulkowitch, H, and Reifenstein, E C *J clin Endocrin* 1941, 1, 234

[5] Patterson J, McPhee, I M and Greenwood A W *Brit med J* 1942, 1, 35

[6] Fraser Albright and Smith, *J clin Endocrin* 1941, 1, 297

[7] Roch M and Monnier, M *Schweiz med. Wschr* 1941 71 1009

LORD MIDLETON AND THE ARMY MEDICAL SERVICE

ST JOHN BRODRICK was Secretary of State for War during the years 1900–03 and there was no exaggeration in the tribute to his memory in the House of Lords last week about the part he played in reforming the medical service of the Army after the South African War "I do not say that he started that reform," said Lord Fitzalan, "but it would not have been carried out unless he had taken it up" And twenty years later Lord Midleton (as he had then become) had his reward when he presided at a banquet in London to the RAM department and listened to the words of the director-general of the service "Nothing much was done that was practical," said Keogh, "until God sent the cause of medical reform two men—Midleton and Haldane Lord Midleton gave the officers of the RAMC the opportunity for postgraduate study which made their scientific position sure, and he founded the school in London" Keogh might have added that whether in peace or in war medicine is one and indivisible, and the official recognition of that fundamental fact dates from the period of Mr Secretary Brodrick

ROCKEFELLER STUDENTSHIPS WANDERJAHRE

THIS year the Rockefeller Foundation is again generously offering studentships to enable twenty-five of our medical undergraduates to take part of their clinical courses at medical schools in the United States and Canada The offer, which is open to men and women, is made primarily to help students in schools which have suffered from enemy action, but application from all medical schools in England, Wales, Scotland and Northern Ireland will be welcome The studentships will usually be tenable for two years, though shorter periods may be arranged, and they will cover all tuition fees and maintenance but not the cost of travel to and from America The students must return to this country to take their final examination The medical schools of the following universities are prepared to take one or two students

California, Chicago, Cincinnati, Columbia, Cornell, Duke, Harvard, Illinois, Iowa, Johns Hopkins, McGill, Michigan, Minnesota, New York, Pennsylvania, Rochester, Stanford, Toronto, Tulane, Vanderbilt, Washington, Western Reserve, Wisconsin and Yale

Applications may be submitted only through the dean of a medical school who must also send a full and confidential report of the candidate Medical certificates including a radiogram of the student's chest must also be submitted, and special mention is made of the importance laid on the examination of the eyes and ears Applications should reach the secretary of the Universities Bureau of the British Empire, Gower Street, London, W C 1, not later than April 25 The students will probably leave this country early in August

A GERMAN PSYCHIATRIST

PAUL SCHROEDER, who held the chair of psychiatry at Greifswald and later at Leipzig, died in Germany last year at the age of 67 He was a pupil of Kraepelin and though he later dissociated himself from this school his interest in the problems of clinical psychiatry as outlined by Kraepelin endured Schroeder's early work was on cerebral histopathology and his "Introduction to the Histology and Histopathology of the Nervous System" was translated into English in 1923 In his writings on hallucinations he tried to get away from the French sensory bias and to look instead at the symptom complexes in which the so called hallucinations occurred At Leipzig where he succeeded Bumke, he took over a well-equipped modern neuropsychiatric hospital which was attached to the university, and to this he added a children's department which was one of the first of its kind in Germany He also founded the Deutsche Gesellschaft für Kinderpsychiatrie und Heilpadagogie Forensic psychiatry, juvenile delinquency, and psychopathic personalities were other topics which interested him, and his latest works on child psychiatry dealt with the study of character Though Schroeder did not open new paths his views were sound, his work reliable, and after the Nazis took over he courageously tried to keep up his standards

NEW OFFICIAL NAMES FOR DRUGS

THE General Medical Council has approved two further names for substances now being produced, or likely shortly to be produced, by British manufacturers (in some instances under licence) which have hitherto been known under other names The question of including these substances in the British Pharmacopœia is under consideration and if any is included the approved name given below will be its official title

Approved Name	*Other Name*
Meprochol	Esmodil
Cyclobarbitone	Phanodorm

It is hoped that these approved names will be generally adopted

CANTEENS AT WORK

MR GARDINER'S book gives a glimpse into a Shavian world of rational planning where machines will be, as they should, the slaves of man lessening his burdens and increasing his efficiency and zest for life [1] He holds that the importance of canteens is as great in peace as in war, seeing that they enormously increase output by providing rest and refreshment, ensure economy of food and money, and give a properly balanced diet which workers are likely to miss in their own homes in these days of universal tin-openers The Government, recognising as much and also that "canteens are second only to wages as a draw," has made them part of its policy, and this book will be of great value to everyone who has to organise and run a canteen Mr Gardiner believes in making full use of modern labour-saving machinery, such as the bread-and-butter cutter which does the work of four full time girls and the tea-urn which keeps tea perfect in taste and temperature for as long as six hours, but he also has the psychological aspect of the job in mind Thus he insists that the dining-room must be a restful looking and cheerful place, with plenty of space and light and with bright yet restful colours in the decorative scheme The tonic effect on the kitchen staff of shining, stainless steel is noted, and even in the planning of the menus he reminds us that "those who have studied food know that contrast in colour creates appetite—all white vegetables with all-white fish is not nearly so tempting as carrots against a creamy sauce" He deals fully with lay-out and design, equipment, stores, finance, food and staff management The book has a cover which charms the eye and is well illustrated with photographs and diagrams, and the appendix includes lists of necessary equipment for canteens of all sizes, and specimen menus with prices Mr Gardiner's ideas of equipment, however, in these days when materials and labour are scarce incline to the lavish, and some of the menus quoted give the impression that rationing has not been introduced yet But underlying principles are always clearly stated and would serve as a guide for war-time planning

---

[1] Canteens at work By C G Gardiner, managing director National Catering Service London London Humphrey Milford Oxford University Press Pp 104 4s 6d

---

The Index and title-page to Vol II, 1941, which was completed with the issue of Dec 27, will be ready shortly A copy will be sent gratis to subscribers on receipt of a post card addressed to the Manager of THE LANCET, 7, Adam Street, Adelphi, W C 2 Subscribers who have not already indicated their desire to receive indexes regularly as published should do so now

Special Articles

MEDICINE AND THE LAW

Relief from War Indebtedness

LAST June Parliament passed the Liabilities (War-Time Adjustment) Act, for the benefit of folk who find themselves "in serious financial difficulties owing to war circumstances" A recent case in the Plymouth county court showed how a doctor, embarrassed by war-time difficulties, can be helped and protected from bankruptcy The debtor had practised in London before the war When hostilities broke out, he was called up from the Supplementary Reserve (Medical Branch) for service with the Royal Navy A year later his surgical and medical equipment and his furniture and household effects, warehoused in London, were completely destroyed by enemy action He had insurance policies to keep up, interest on borrowed money to meet, income tax and war damage contributions to pay, and such other outgoings to settle as a professional man cannot avoid His position could fairly be described as one of "serious financial difficulties owing to war circumstances," the last two words being defined by the act as circumstances directly or indirectly attributable to any war in which His Majesty is engaged He applied, as section 1 of the act enables him to do, to a "liabilities adjustment officer" There is one at least of these officials in every county court district, the debtor obtains their services free unless there is any special expense to be incurred in the proceedings, even this can be remitted in cases of hardship The debtor is entitled by the act to obtain in this manner "advice and assistance in enabling him to arrive at an equitable and reasonable scheme of arrangement with his creditors, and, in particular, at such a scheme of arrangement as will enable him, if he carries on a business (or would, but for war circumstances, carry on a business) to preserve that business or to recover it when circumstances permit" The official went into the doctor's liabilities and presumably communicated with the creditors (only one creditor thought it necessary to attend the court) and drew up proposals which would give the debtor the prospect of tiding over his financial troubles The judge accepted the scheme and confirmed it by an order of the court To state the arrangements briefly, a sum of £70 standing to the doctor's credit was to be paid into court, the liabilities adjustment officer would have first claim on what the War Damage Commission would pay, the doctor would keep up his payments on three life insurance policies and the interest charges on loans secured by those policies, so far as he could, he would vest the policies in the adjustment officer, he would also transfer to him any special grants received and he would for the present pay into court £2 per month, finally, he would collect as much as possible from his book debts and pay that money also into court The doctor informed the judge of his hope of increasing the monthly payment from £2 to £5 as soon as certain deductions from his salary for income tax arrears ceased

Men in the debtor's position are passing through a hard time, but the act seems to offer them valuable help It is, moreover, being administered with conspicuous sympathy The liabilities adjustment officer, for instance, pressed the judge at Plymouth to hear the application "in chambers" and not in open court He emphasised the misfortune to a professional man if his name and address should be broadcast in the press Although some courts, it seems, are conceding this point, the court at Plymouth had the usual judicial dislike of secrecy The judge observed that the act, by requiring the earlier proceedings to be in private, inferentially suggested that the rest of the case would be public He thought it desirable that people should hear of the act and its purpose and perhaps also that creditors should have the chance to know what was going on By way of compromise the reporters were asked to withdraw while the full detail of the doctor's affairs was revealed and were invited to return to the court when the arrangements were finally approved The judge asked the press not to disclose the doctor's name and address He had no power to order secrecy, but his confidence in the discretion of the reporters was not misplaced The machinery of the act, carefully worked out in the Lord Chancellor's department, involves an official register being kept of all these schemes of arrangement, each county court will keep an index of the schemes which come before it and of the orders made thereon Search of the index and inspection of an order are permitted on proper application and payment of a fee, but there seems to be reasonable protection against mere curiosity on the part of persons not legitimately concerned Debtors and creditors may, if the adjustment officer agrees, be represented before him by solicitor or counsel, it looks, however, as if the adjustment officer, himself legally expert in these matters, may be relied upon to give the debtor all the guidance that he may need

The Works Doctor

In an address on "Workmen's Compensation as it concerns the Works Doctor," delivered to the Advisory Medical Committee of the Industrial Welfare Society, Mr H Samuels[1] emphasised once more the misfortune of the divorce of compensation from accident prevention and rehabilitation Something might be done to encourage individual employers by offering them a reduction of premiums in their compensation insurance where their rate of accidents is low But, as he pointed out, this merit-rating has no special financial attraction, the employer's premiums are deducted from profits for income-tax purposes, so that a rebate on the premiums is of no commercial interest Mr Samuels briefly discussed the two essential elements in compensation liability—the "accident" and the chain of causation connecting the accident with the incapacity There are complicated questions here For instance, if a driver falls from a lorry and tuberculosis is afterwards diagnosed, and it is proved that there were signs of tuberculosis before the accident and that the fall brought the disease to light, compensation will be payable Cases of neurasthenia and even suicide can be difficult The workman, he reminded works doctors, has no statutory right to have his own doctor present at a medical examination arranged by the employer, but a refusal to be examined except in his own doctor's presence is not such obstruction as will exclude compensation The examination must be at reasonable hours A firm's doctor wanted a workman to be specially examined in hospital, the man refused, the court held the refusal justified because no time was specified for the length of his attendance at the hospital Mr Samuels mentioned the possible common-law liability of the employer for negligent treatment if a works nurse happens to carry out duties without supervision in some respect outside the scope of a nurse's ordinary work He applied the analogy of Hillyer *v* St Bartholomew's Hospital The hospital authority, it will be recalled, is not liable for the negligence of nurses acting under the instructions of a surgeon, but may be liable if the nurse is acting outside her duties as a nurse It follows that an employer, having engaged a qualified doctor and properly trained nurse, ought to be careful to limit the latter's functions to activities appropriate to her training

INDUSTRIAL DERMATITIS

Dr P B MUMFORD (Manchester), who opened a discussion at a meeting of the Association of Industrial Medical Officers in Manchester on Jan 31, analysed the attitude towards dermatitis of the worker, the chemist, the works doctor and the dermatologist and stressed the need for coordination of all their points of view The referee who has the final decision is unfortunately often not a dermatologist and must base his opinion on the history given to him by the worker Industrial dermatitis may be caused by fat solvent action, deleterious effects of soap irritation by acid, alkali, or friction the blockage of sebaceous ducts, allergic phenomena, or infection with monilia But both worker and management must realise that unless the word "dermatitis" was qualified by the adjective "occupational" it did not count as an industrial disease There can be no universal protective agent, but the ideal protective barrier must be elastic, adsorptive, must neutralise the irritant and if possible have a slightly acid reaction It should also be unmiscible with the vehicle

---

[1] *Industrial Welfare*, July–Aug 1941

LORD MIDLETON AND THE ARMY MEDICAL SERVICE

St John Brodrick was Secretary of State for War during the years 1900–03 and there was no exaggeration in the tribute to his memory in the House of Lords last week about the part he played in reforming the medical service of the Army after the South African War "I do not say that he started that reform," said Lord Fitzalan, "but it would not have been carried out unless he had taken it up" And twenty years later Lord Midleton (as he had then become) had his reward when he presided at a banquet in London to the RAM department and listened to the words of the director-general of the service "Nothing much was done that was practical," said Keogh, "until God sent the cause of medical reform two men—Midleton and Haldane Lord Midleton gave the officers of the RAMC the opportunity for postgraduate study which made their scientific position sure, and he founded the school in London" Keogh might have added that whether in peace or in war medicine is one and indivisible, and the official recognition of that fundamental fact dates from the period of Mr Secretary Brodrick

ROCKEFELLER STUDENTSHIPS WANDERJAHRE

This year the Rockefeller Foundation is again generously offering studentships to enable twenty-five of our medical undergraduates to take part of their clinical courses at medical schools in the United States and Canada The offer, which is open to men and women, is made primarily to help students in schools which have suffered from enemy action, but application from all medical schools in England, Wales, Scotland and Northern Ireland will be welcome The studentships will usually be tenable for two years, though shorter periods may be arranged, and they will cover all tuition fees and maintenance but not the cost of travel to and from America The students must return to this country to take their final examination The medical schools of the following universities are prepared to take one or two students

California, Chicago, Cincinnati, Columbia, Cornell Duke, Harvard, Illinois, Iowa, Johns Hopkins, McGill, Michigan, Minnesota, New York, Pennsylvania, Rochester, Stanford, Toronto, Tulane, Vanderbilt, Washington, Western Reserve, Wisconsin and Yale

Applications may be submitted only through the dean of a medical school who must also send a full and confidential report of the candidate Medical certificates including a radiogram of the student's chest must also be submitted, and special mention is made of the importance laid on the examination of the eyes and ears Applications should reach the secretary of the Universities Bureau of the British Empire, Gower Street, London, W C 1, not later than April 25 The students will probably leave this country early in August

A GERMAN PSYCHIATRIST

Paul Schroeder, who held the chair of psychiatry at Greifswald and later at Leipzig, died in Germany last year at the age of 67 He was a pupil of Kraepelin and though he later dissociated himself from this school his interest in the problems of clinical psychiatry as outlined by Kraepelin endured Schroeder's early work was on cerebral histopathology and his "Introduction to the Histology and Histopathology of the Nervous System" was translated into English in 1923 In his writings on hallucinations he tried to get away from the French sensory bias and to look instead at the symptom-complexes in which the so called hallucinations occurred At Leipzig, where he succeeded Bumke, he took over a well equipped modern neuropsychiatric hospital which was attached to the university, and to this he added a children's department which was one of the first of its kind in Germany He also founded the Deutsche Gesellschaft fur Kinderpsychiatrie und Heilpadagogie Forensic psychiatry, juvenile delinquency, and psychopathic personalities were other topics which interested him, and his latest works on child psychiatry dealt with the study of character Though Schroeder did not open new paths his views were sound, his work reliable, and after the Nazis took over he courageously tried to keep up his standards

NEW OFFICIAL NAMES FOR DRUGS

The General Medical Council has approved two further names for substances now being produced, or likely shortly to be produced, by British manufacturers (in some instances under licence) which have hitherto been known under other names The question of including these substances in the British Pharmacopœia is under consideration and if any is included the approved name given below will be its official title

Approved Name	*Other Name*
Meprochol	Esmodil
Cyclobarbitone	*Phanodorm*

It is hoped that these approved names will be generally adopted

CANTEENS AT WORK

Mr Gardiner's book gives a glimpse into a Shavian world of rational planning where machines will be, as they should, the slaves of man lessening his burdens and increasing his efficiency and zest for life[1] He holds that the importance of canteens is as great in peace as in war, seeing that they enormously increase output by providing rest and refreshment, ensure economy of food and money, and give a properly balanced diet which workers are likely to miss in their own homes in these days of universal tin-openers The Government, recognising as much and also that "canteens are second only to wages as a draw," has made them part of its policy, and this book will be of great value to everyone who has to organise and run a canteen Mr Gardiner believes in making full use of modern labour-saving machinery, such as the bread-and-butter cutter which does the work of four full time girls and the tea-urn which keeps tea perfect in taste and temperature for as long as six hours, but he also has the psychological aspect of the job in mind Thus he insists that the dining-room must be a restful looking and cheerful place, with plenty of space and light and with bright yet restful colours in the decorative scheme The tonic effect on the kitchen staff of shining stainless steel is noted, and even in the planning of the menus he reminds us that "those who have studied food know that contrast in colour creates appetite—all white vegetables with all-white fish is not nearly so tempting as carrots against a creamy sauce" He deals fully with lay-out and design, equipment, stores, finance, food and staff management The book has a cover which charms the eye and is well illustrated with photographs and diagrams, and the appendix includes lists of necessary equipment for canteens of all sizes, and specimen menus with prices Mr Gardiner's ideas of equipment, however, in these days when materials and labour are scarce incline to the lavish, and some of the menus quoted give the impression that rationing has not been introduced yet But underlying principles are always clearly stated and would serve as a guide for war-time planning

---

[1] Canteens at work By C G Gardiner managing director, National Catering Service London London Humphrey Milford Oxford University Press Pp 104 4s 6d

---

The Index and title-page to Vol II, 1941, which was completed with the issue of Dec 27, will be ready shortly A copy will be sent gratis to subscribers on receipt of a post card addressed to the Manager of The Lancet, 7, Adam Street, Adelphi, W C 2 Subscribers who have not already indicated their desire to receive indexes regularly as published should do so now

Special Articles

MEDICINE AND THE LAW

Relief from War Indebtedness

LAST June Parliament passed the Liabilities (War-Time Adjustment) Act, for the benefit of folk who find themselves " in serious financial difficulties owing to war circumstances " A recent case in the Plymouth county court showed how a doctor, embarrassed by war-time difficulties, can be helped and protected from bankruptcy The debtor had practised in London before the war When hostilities broke out, he was called up from the Supplementary Reserve (Medical Branch) for service with the Royal Navy A year later his surgical and medical equipment and his furniture and household effects, warehoused in London, were completely destroyed by enemy action He had insurance policies to keep up, interest on borrowed money to meet income tax and war damage contributions to pay, and such other outgoings to settle as a professional man cannot avoid His position could fairly be described as one of "serious financial difficulties owing to war circumstances," the last two words being defined by the act as circumstances directly or indirectly attributable to any war in which His Majesty is engaged He applied as section 1 of the act enables him to do to a " liabilities adjustment officer " There is one at least of these officials in every county court district, the debtor obtains their services free unless there is any special expense to be incurred in the proceedings, even this can be remitted in cases of hardship The debtor is entitled by the act to obtain in this manner " advice and assistance in enabling him to arrive at an equitable and reasonable scheme of arrangement with his creditors, and, in particular, at such a scheme of arrangement as will enable him, if he carries on a business (or would but for war circumstances, carry on a business) to preserve that business or to recover it when circumstances permit " The official went into the doctor's liabilities and presumably communicated with the creditors (only one creditor thought it necessary to attend the court) and drew up proposals which would give the debtor the prospect of tiding over his financial troubles The judge accepted the scheme and confirmed it by an order of the court To state the arrangements briefly, a sum of £70 standing to the doctor's credit was to be paid into court, the liabilities adjustment officer would have first claim on what the War Damage Commission would pay, the doctor would keep up his payments on three life insurance policies and the interest charges on loans secured by those policies, so far as he could, he would vest the policies in the adjustment officer, he would also transfer to him any special grants received and he would for the present pay into court £2 per month, finally, he would collect as much as possible from his book debts and pay that money also into court The doctor informed the judge of his hope of increasing the monthly payment from £2 to £5 as soon as certain deductions from his salary for income tax arrears ceased

Men in the debtor's position are passing through a hard time, but the act seems to offer them valuable help It is, moreover, being administered with conspicuous sympathy The liabilities adjustment officer, for instance, pressed the judge at Plymouth to hear the application " in chambers " and not in open court He emphasised the misfortune to a professional man if his name and address should be broadcast in the press Although some courts, it seems, are conceding this point, the court at Plymouth had the usual judicial dislike of secrecy The judge observed that the act, by requiring the earlier proceedings to be in private, inferentially suggested that the rest of the case would be public He thought it desirable that people should hear of the act and its purpose and perhaps also that creditors should have the chance to know what was going on By way of compromise the reporters were asked to withdraw while the full detail of the doctor's affairs was revealed and were invited to return to the court when the arrangements were finally approved The judge asked the press not to disclose the doctor's name and address He had no power to order secrecy, but his confidence in the discretion of the reporters was not misplaced The machinery of the act, carefully worked out in the Lord Chancellor's department, involves an official register being kept of all these schemes of arrangement, each county court will keep an index of the schemes which come before it and of the orders made thereon Search of the index and inspection of an order are permitted on proper application and payment of a fee, but there seems to be reasonable protection against mere curiosity on the part of persons not legitimately concerned Debtors and creditors may, if the adjustment officer agrees, be represented before him by solicitor or counsel, it looks, however, as if the adjustment officer, himself legally expert in these matters, may be relied upon to give the debtor all the guidance that he may need

The Works Doctor

In an address on " Workmen's Compensation as it concerns the Works Doctor," delivered to the Advisory Medical Committee of the Industrial Welfare Society. Mr H Samuels[1] emphasised once more the misfortune of the divorce of compensation from accident prevention and rehabilitation Something might be done to encourage individual employers by offering them a reduction of premiums in their compensation insurance where their rate of accidents is low But as he pointed out, this merit-rating has no special financial attraction ; the employer's premiums are deducted from profits for income-tax purposes, so that a rebate on the premiums is of no commercial interest Mr Samuels briefly discussed the two essential elements in compensation liability—the " accident " and the chain of causation connecting the accident with the incapacity There are complicated questions here For instance, if a driver falls from a lorry and tuberculosis is afterwards diagnosed, and it is proved that there were signs of tuberculosis before the accident and that the fall brought the disease to light, compensation will be payable Cases of neurasthenia and even suicide can be difficult The workman he reminded works doctors, has no statutory right to have his own doctor present at a medical examination arranged by the employer, but a refusal to be examined except in his own doctor's presence is not such obstruction as will exclude compensation The examination must be at reasonable hours A firm's doctor wanted a workman to be specially examined in hospital, the man refused, the court held the refusal justified because no time was specified for the length of his attendance at the hospital Mr Samuels mentioned the possible common-law liability of the employer for negligent treatment if a works nurse happens to carry out duties without supervision in some respect outside the scope of a nurse's ordinary work He applied the analogy of Hillyer *v* St Bartholomew's Hospital The hospital authority, it will be recalled, is not liable for the negligence of nurses acting under the instructions of a surgeon, but may be liable if the nurse is acting outside her duties as a nurse It follows that an employer, having engaged a qualified doctor and properly trained nurse ought to be careful to limit the latter's functions to activities appropriate to her training

INDUSTRIAL DERMATITIS

DR P B MUMFORD (Manchester), who opened a discussion at a meeting of the Association of Industrial Medical Officers in Manchester on Jan 31, analysed the attitude towards dermatitis of the worker, the chemist, the works doctor and the dermatologist and stressed the need for coördination of all their points of view The referee who has the final decision is unfortunately often not a dermatologist and must base his opinion on the history given to him by the worker Industrial dermatitis may be caused by fat solvent action deleterious effects of soap irritation by acid alkali, or friction the blockage of sebaceous ducts, allergic phenomena, or infection with monilia But both worker and management must realise that unless the word " dermatitis " was qualified by the adjective " occupational " it did not count as an industrial disease There can be no universal protective agent, but the ideal protective barrier must be elastic, adsorptive, must neutralise the irritant and if possible have a slightly acid reaction It should also be immiscible with the vehicle in which the irritant reaches the skin, have a greater preferential solubility for the irritant than the skin, lack de-greasing effect and penetrative and conveying power, and be easily removed It should have a pleasant consistency, and not make the hands sticky or slimy It should be cheap and free from commercial control It would be difficult to find a substance fulfilling all these requirements The five types in common use were paraffin oils, fats, waxes and mixtures of them, tragacanth, agar and colloid mixtures, clay bases, oil-water emulsions and soap clays

---

[1] *Industrial Welfare*, July–Aug 1941

Dr ALICE PETERS (London) said that *dermatitis in filling factories* is of two types The first and larger group caused by the chemical explosives is a contact dermatitis Its incidence is governed by the amount of contact, "freedom from exposure" intervals, and friction The temperature of the work-room, sweating, maceration of the skin, and the presence of abrasions are secondary factors The lesions are caused partly by chemical trauma and partly by allergic reaction, and may spread beyond the contact areas because of sensitisation At first they are erythematous and later may become papular, vesicular, eczematous and lichenified It is difficult to watch for new cases of dermatitis on the night shift, and as the incidence of the dermatitis tends to occur between the fourth and fifth day of contact with fulminate of mercury, and between the ninth and sixteenth day with tetryl, beginners should not be on the night shift at these times

Cheiropompholyx is more common among TNT workers, and when it is severe appears as an erythematous, papular rash It should be regarded as a manifestation of TNT dermatitis, even with obvious fungus infection Proper washing and total removal from contact of affected workers should be insisted upon Ointments should not be used when the worker could come in contact with tetryl or TNT The use of 5% sodium sulphite and 10% sodium thiosulphate in soap is effective in removing tetryl and fulminate respectively from the skin

Dr A THELWALL JONES (Widnes) in a paper on *occupational acne* discussed cases caused by handling chlorinated naphthalenes Whether this disease is produced by a local irritant, or whether the irritant is first inhaled and then excreted through the skin, is still not known The fact that there is often a latent period of some months between starting the work and the appearance of the lesions and that crops of lesions appear after removal from the irritation suggests that the action is a local one It is certain, however, that the ultimate effect is a hypersecretion of sebaceous glands, the areas attacked are usually the exposed parts, particularly the face, but often areas underneath the shirt which are not properly washed are attacked The so-called chlor-acne is not produced by chlorine itself and differs from acne vulgaris in that the skin is not greasy, there are more blackheads and the nose is commonly spared The areas attacked of course are those which are rich in sebaceous glands, these are irritated so as to produce hypersecretion with subsequent blockage The scalp is spared perhaps because the erector pilæ muscles are better developed in this area It is said that the liver is affected, this of course will not be the case in acne vulgaris As vapour alone is responsible to prevent the condition all fumes must be removed Other methods of control consist in choosing workers who are not of acne age and who have not greasy skins, and in providing for washing facilities, frequently changed protective clothing and general cleanliness

Dr W E CHIESMAN (Runcorn), who discussed *skin injuries due to vesicants*, compared thermal burns with those caused by mustard and other irritants; in the former the burn is surrounded by a zone of leucocytes and the tissue destruction is complete as soon as the burn is inflicted In mustard burns the burn has a margin of capillaries filled with altered blood and necrotic material The burn is progressive for 3–4 days Anti-gas ointment should be applied at once unless the skin is actually damaged In an atmosphere of mustard gas the sense of smell becomes fatigued, so that the danger may not be quickly realised In preventing the progressive effect of the vesicants the blister should be punctured but the skin should be preserved, compresses of amyl salicylate reduce the œdema and can be used for three or four days The final ulcer might be treated with cod-liver oil or by other methods Considerable success has been obtained by covering the lesions with perforated oiled silk with a dry boracic dressing over it

BOROUGHS PLAN TYPHUS CONTROL

AT the suggestion of the Ministry of Health the London County Council and the metropolitan boroughs have discussed measures to control any epidemic of typhus which may break out in London Isolation of cases will be undertaken by the L C C, who have already arranged for one of their hospitals to take cases, and will make further arrangements if necessary The boroughs of Westminster, Chelsea, Fulham, Hammersmith, and Kensington have drawn up a joint plan which will not, of course, operate until cases of typhus appear As a preliminary measure 12 members of the Kensington public health staff have been immunised against typhus, protective clothing has been purchased and personnel are being trained in the care needed when dealing with clothing from typhus patients and with contacts Some young conscientious objectors who are willing to take part will also be trained

The boroughs have agreed that the scheme and the staff operating it should be under the control of Kensington Disinfestation of premises, articles, and persons, and temporary housing of contacts will be the responsibility of Mr H W Walters, the Kensington senior sanitary inspector The borough already has the premises and plant needed for the task, including a disinfestation depot with three steam disinfecting chambers for clothing and articles, equipment for sterilising, washing, and ironing bed linen, a cyanide plant where furniture can be deloused in welded steel vans and a delousing station where contacts can take baths This last station, though large enough to serve in a small epidemic, would have to be supplemented in a serious outbreak by cleansing stations in the other boroughs In Kensington some furnished flats are at present reserved for people who are temporarily homeless while their houses are being disinfected, and a resident caretaker is employed, in case of need these flats could immediately be used as a clearing house for typhus contacts The borough owns two metal-lined vans—one for infected and one for sterilised material—in addition to the welded steel vans used for cyanide disinfestation These would be adequate transport during the early stages of an epidemic, a survey is being made of vehicles in the other four boroughs which could be used if an outbreak became widespread

If a case of typhus is diagnosed the medical officer of health will decide what disinfection is necessary and what contacts must attend for delousing, and will pass the information to Kensington by telephone The van for infected material will go at once to the house, manned by a team wearing protective clothing Bedding and clothing will be put into stout bags Meanwhile the disinfecting staff will seal the openings and fumigate with sulphur or some other suitable agent Notices will be posted on all entrances warning people not to enter As soon as the team reaches the disinfestation depot the clothing from the infected house will be sorted, articles unsuitable for exposure to steam being sent for cyanide treatment The team will then take off their protective clothing (which will also go to be sterilised) and will at once take hot baths After disinfestation the articles from the house will be packed in clean bags for return to the owners, and next day the disinfesting staff will spray the house throughout with liquid insecticide

Contacts to be deloused will be taken, in transport arranged by the M O H, to the cleansing station, where records of each case will be kept Under the supervision of the staff there—all of whom will wear protective clothing—the contacts will take hot baths to which disinfectant has been added, and after receiving back their disinfested clothes will go to one of the flats in the clearing house to spend the night Their only luggage will be such toilet articles as toothbrush and razor Stocks of tea, sugar, cocoa, bread cheese, jam, and condensed milk will be kept at the clearing house for their use, and more solid meals can be sent in from a British restaurant nearby The caretaker of the flats will keep records of those admitted

This scheme is thought to be adequate to deal with the initial stages of an epidemic and could easily be expanded to cope with a large outbreak It has been difficult to judge what staff would be needed but it is proposed that the disinfesting team should consist of four motor drivers eight outside disinfestors (to pack and sort articles), *four inside disinfestors (to fumigate* and spray premises) and one superintendent: at the cleansing station there should be a superintendent and four men and four women attendants and at the clearing house only the resident caretaker All these people will be immunised

In England Now

A Running Commentary by Peripatetic Correspondents

THE school had broken up for the Christmas holidays and the boys in the half-light were waiting for the buses A prowling master found some of them smoking and told them to report back to their house-masters for execution They missed the bus and the train, and kept us waiting for three and a half hours on Paddington station In coloration the damage almost came up to the mandrill standard, eight lines showed a fair attempt at close parallelism Two months before in a patient with a long-standing pruritus I took 10 c cm of blood from the arm and injected it into his buttock. It did him a power of good I think Nature budgeted for a certain amount of regular bruising Except in this way I am sure the thrashing did one boy no good at all—on the contrary It was so manifestly a silly, disproportionate, and unseasonable punishment He is 16 and within limits can smoke what he likes in the holidays I daresay he has averaged about two a day Schoolmasters, like A. Hitler suffer from a relative omnipotence, but I don't think they should be so omnipotent as to be able to reverse the Mosaic Law and visit the sins of the children on the fathers even unto the third and fourth hour on Paddington station

* * *

If this war goes on much longer the standard of medical students, and therefore of medical education, is going to decline The last two years have certainly confirmed the fears of those of us who saw from the beginning the defects of the present scheme whereby medical students are exempt from military service No-one will question that an adequate supply of fully qualified doctors is necessary for the Services, where some of us differ from authority is on the means by which this aim can best be attained What is happening now is that the flower of our youth are going into the Services as soon as they come of military age, either from school or after one or two years at the university Whatever the calling-up regulations no self-respecting youth likes the idea of spending the rest of the war studying for a profession while his contemporaries are fighting in the Middle or Far East, and it is going to take strong arguments to make him believe that he is best serving his country by leading a life of comparative comfort and security as a medical student There are probably a few skrimshankers who see in the reservation of medical students an opportunity of evading all responsibility, unpleasantness and risk to life—but I have had practically no experience of these because our medical school has more applicants than vacancies The effect on the ordinary youth however is becoming gradually serious He can begin by reasoning that he will serve his country by continuing his medical studies—if he were not doing so the Government would no longer reserve him—but when he sees all his contemporaries in uniform, hears how the war is progressing and discovers the inevitable attitude of strangers who only see a healthy young man in civilian dress doubts creep in He finds it increasingly difficult to concentrate on his work spare-time service in the Home Guard seems impracticable and in the end he does scant justice to himself, his work and his country The inevitable is already happening the more enterprising students are leaving to join the Services No obstacle can be put in the way of junior men but with those nearing qualification some remonstrance is indicated One student who approached me recently for my advice felt he could no longer continue with his studies—he must go into one of the Services " All honour to you," was my reply; " but before coming to a final decision just consider this point you tell me that it will take six months to complete the training for the particular branch you are proposing to join; in another nine months you will be qualified and therefore able to join the Services as a fully qualified medical officer If you give up medicine now it will take six years to train whoever replaces you here. In other words in order to be able to satisfy your praiseworthy ambition of serving your country three months earlier you are prepared to deprive your country of the services of a much-needed medical officer for six years' He had never thought of it in that way but he did subsequently and now he is getting down to work as he has not been able to do for months I have not the slightest doubt that in nine months he will have qualified

My solution of the whole problem is like all paper-schemes simplicity itself Conscript every male at the appropriate age and second the necessary number for medical studies Keep them in uniform make them attend regular drills during the week exercises at the weekend and large-scale manœuvres for 2–3 weeks each year In this way you will inculcate military discipline keep the men physically fit and teach them how to use a rifle or tommy-gun The King's uniform will preserve and even enhance their self-respect Their studies will be interrupted less than they are at present and the country will have at its disposal a useful body of efficient keen and highly trained young men instead of a rather dissatisfied, untrained collection who could do little in an invasion To put medical students into uniform would certainly be a move in the right direction

Otherwise we are faced with a reversion to the methods of the last war whereby medical students were recruited as ordinary combatants and subsequently released to complete their studies when medical personnel became scarce In my experience men who qualified under that regimen are not inferior in any respect to their colleagues who qualified before or after that war, in many ways they are better doctors partly because they were of the type who volunteered for active service at the earliest possible moment partly because their experience in the Army produced a more mature and experienced outlook on life. That the present system is failing is suggested by recent final examination results which show a *definite fall in the standard expected* Conditions of work may have been difficult but if you grant your medical student exemption from military service and do not restrict the period necessary for qualifying you have no right to lower the standard

* * *

One reason why my occasional afternoons with a shotgun afford me so much satisfaction is that I never know, until almost the last moment, whether I shall be able to get done in time for them or not As a rule, I shoot with a colleague who practises eight miles away, one of those conscientious country doctors who rises at cockcrow and works far into the night so that he may shoot in the afternoon " After all, he says " you can see patients by artificial light when you can't shoot " When I ring him up he is slow to answer the telephone and greets me with all the defensive surliness of an overworked and single-handed G P. anticipating yet another late call ' Yes what is it ? ' he grunts " It's all right," I answer " I was only wondering if there was any chance of your getting off for a couple of hours to-day ? " Instantly his surliness gives way to good humour " Yes I think so " he says, not very doubtfully " come over about two if you can I'll meet you at the tumbledown cottage ' Sometimes early in the season, they hunt us down in a rootfield or a clover arrish with the unexpected sudden call in which case we have to swap our guns for forceps and the chloroform bottle, but we contrive to pick up our guns again if we finish before the light fails At this time of year we walk knee-deep through miles of wet bracken with two beaters and a small boy who has not yet returned to school and is collecting cartridge cases for salvage Taffy and Beauty the two hard-working spaniels weave in and out in front of us Taffy stricken in years and lame from a badly mended broken leg hunts more slowly than Beauty but he is more thorough less shy of them " brimmles ' and, like the bed-bug, gets there just the same At half-time on Saturday the score was 3 rabbits all with my colleague, despite a bad start (a double miss), showing slightly the better average 3 for 7 shots as against my 3 for 8 In the second half, however, he could do nothing wrong and ran right away from me The final score was 13 rabbits and a woodcock, his share being 9 rabbits and the bird for 16 shots, no mean performance With a mere 4 for 12 I had to sing pretty small, especially when the senior beater remarked "These yur rabbits is so big as 'ares, nobody niver didden ought to miss 'em" Big as hares or not, they don't hang about much

* * *

The peripatetic who recorded some disconnected and curious observations a few months ago must have reminded many of similar interesting facts unsuitable for formal presentation How many surgeons, for instance, have noted that fat people recover more rapidly and completely from fractures around joints than do their more elegantly silhouetted neighbours? Is it that the joviality associated with fat men extends to the body as well as to the mind, so that the reparative processes work more harmoniously? Or does a generous distribution of adipose tissue enable a greater number of blood-vessels to serve the injured structures, so that effusions, hæmorrhages and indurations are removed more efficiently? Then why do fractures of the shaft of the tibia unite and consolidate more rapidly in the winter than in the summer? Perhaps it is due to less ambulation imposed by the inclemency of winter It is, no doubt, heretical in these days to decry "*functional treatment*" of fractures, yet many years observation and active participation in the treatment of these cases makes me wonder whether we are *quite* sure that unlimited ambulation is wise. Certainly very early ambulation should not be permitted on any account No plaster cast, whether padded or skin tight, is capable of giving absolute immobilisation, the very nature of our tissues militates against it Muscle masses are reduced in size by pressure as well as by disuse atrophy, anyone who has applied a tourniquet knows this well Nor can the areas around the joints where the bones become subcutaneous be used to obtain a perfect grip When we try to obtain it here we always cause pressure necrosis of the skin, which is a plaster sore So perhaps the lessened activity in winter eliminates those tiny shearing movements which are too small to be appreciated but which interfere with and delay the union of fractures by rupturing the newly formed capillaries

It is unfashionable to accept impressions in modern surgery, but they often spur us on to conduct a more scientific investigation I have an impression that neither the amount of adipose tissue nor the degree of functional exercise, either under expert supervision or as common domestic duties, employed in the treatment of a Colles fracture determines whether on the removal of the plaster the wrist will be freely movable or stiff A few weeks ago I remarked to my secretary at the fracture clinic that nearly every wrist had an excellent range of movement immediately the plaster was taken off I said "It has been like this for some time now, two months ago they were stiff and in a short time they will be stiff again, they always go in periods like this" Sure enough within ten days nearly all the wrists showed this inexplicable stiffness which is severe enough to warrant sending them to the massage department for physiotherapy Factors such as the severity of the fracture, the anæsthetic used in reducing the deformity, the type of plaster (slab or complete), the weather, the length of immobilisation, the amount of use given to the arm and the degree of cooperation by the patient do not seem to have any connexion with the phenomenon It is not the infrequent so-called atrophic change Nor can I find any evidence that pseudo-Volkmann's contracture is in any way connected with it In fact, I can't explain it

---

ROYAL MEDICO PSYCHOLOGICAL ASSOCIATION —An examination for the Gaskell medal and prize of this society will be held on May 4 in London and other centres The oral examination will be in London three weeks later Candidates should give notice of their intention to compete to the registrar of the association at 11, Chandos Street, London, W 1, if possible not later than the middle of March

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS M P

THE Army Estimates for 1942 were introduced on Feb 19 by Captain Margesson, who has since been succeeded as Secretary of State for War by Sir James Grigg Captain Margesson's statement covered a period during which there have been six campaigns—in Libya, East Africa, Greece and Crete, Iraq and Syria, and the Far East In all of these campaigns the health of the Army has been good and the medical services have worked efficiently This also applies to the contingents of our allies, the Free French, Poles, Czechs and others as well as to ourselves The medical service of our Russian allies is, of course, distinct from ours and we have not as yet, on the medical side, got into very close liaison with them But the great help being sent to Russia in medical supplies is an earnest of our wish to be in the closest relations

The Secretary of State for War did not, in his original statement, refer to the Army Medical Service, but he gave the proportion of casualties suffered by troops from the United Kingdom in comparison with those from the Dominions, from India and elsewhere Our troops made up about half the total number and casualties fell on our troops far more heavily than on any others Of every 100 men killed or wounded in the land fighting since the beginning of the war up to January, 1942, about 70 have come from this country

Sir Francis Fremantle's survey of the medical aspect of the war began with his experience as assistant secretary to the departmental committee of the War Office which advised Mr Brodrick, as he then was, on the reorganisation of the Army Medical Service Another datum line in the debate was a quotation from Wolseley, who in 1886 wrote "The sanitary officer as a general rule is a very useless functionary In future, so long as this fad continues, my recommendation is to leave him at the base" The result of this policy was 58,000 cases of enteric in South Africa out of an average army strength of 208,000, with 8000 deaths and only 7000 deaths from casualties killed in action In the 1914–18 war there were only 7500 cases of enteric and only 266 deaths

Sir Francis thought the War Office took the medical services too much for granted and still looked on them as though their function were only to treat wounds in the field He drew special attention to the psychoneuroses which were stated to be the cause of 15% of invalidings from the service Sir Francis also raised the question of the medical service of the Home Guard, but no clear reply was given because, as yet, no clear policy has been formulated The two alternatives are to treat the Home Guard as ordinary infantry units and attach medical officers to battalions, or to allocate medical services to the Home Guard on an area basis, doctors working in the area in which they normally practise Both methods may be required, but the area basis is more generally applicable in rural areas such as the Eastern counties where it has been in operation since the Home Guard was formed

Dr Haden Guest, after rebutting the slanderous accusations which have been made against ATS and other women's services, raised the question of the hygiene function of the RAMC The most important duty of the medical service was to see that men keep well and that the conditions of their lives are as good as they can be He drew attention to the close link between the C O of a unit and the M O in maintaining not only health and fitness but morale The main point of his speech, however, was to draw attention to the work of the Shakespeare Committee which was appointed to determine priorities in the allocation of medical personnel as between the Services, the EMS and the civilian needs of the community The committee has now reported and a regional organisation has been set up

Sir Edward Grigg, under secretary to the War Office, in his reply said that the Army now had sufficient doctors and it was realised that the civil population must not be starved of doctors Dr Haden Guest asked whether it was necessary to keep the Shakespeare Committee in being as a "fifth wheel of the coach" as it had now done its excellent fact-finding work It was suggested that an executive committee of the medical heads of the three Services and the Emergency Medical Service, together with the chief medical officer of the Ministry of Health, the secretary of the Central Medical War Committee and representatives of private medical practitioners under a lay chairman could do all the work This liaison committee, with all the facts and executive authority at its disposal, would save correspondence, paper and above all time in making decisions Sir Edward Grigg said that the War Office would bear the suggestion in mind as it was very much to the point

The health of British troops contrasted favourably with that of enemy prisoners, among whom dysentery, typhoid and other diseases are prevalent There is only one feature of the health of the troops which is not good—some 80% require dental treatment But whether this should be regarded as medical treatment ordinarily so defined or preventive treatment the Under-secretary did not say

A point raised by Sir Ronald Ross was not answered but remains an important interrogative point Can anything be done about disabilities involving discharge from the service which are held to be "not attributable" to such service? Under Workmen's Compensation law compensation would be paid Could there, Sir Ronald asked, be some appeal to an independent tribunal? That would mean in effect the appeal tribunals of the House of Lords as they were set up after the 1914–18 war The matter is being considered

QUESTION TIME

Medical Man Power

Sir Leonard Lyle asked the Minister of Health how many doctors had been released from the services to continue civilian practice under the system described on Feb 5—Mr. E. Brown replied I have not the complete figures for the whole time this system has been in operation, but during the last four months the Central Medical War Committee has recommended the release of 36 doctors from the Services to private practice The release of all these doctors has not yet been effected, but only in 4 cases have the Service departments found it impossible to release them—Replying to a suggestion that the Services might call up doctors for a short period of training and then release them, Mr Brown said that he was afraid that the supplementary question over simplified the problem. He assured Mr Rhys Davies that the services of eminent alien doctors now in this country were being utilised.

Replying to a further question Mr Brown said that the calling up of civil doctors had increased the average number of panel patients per working panel doctor, but in view of the connexion with call up statistics it would not be in the public interest to indicate the extent of this increase—Sir L Lyle Does it not indicate that a serious state of affairs may arise in regard to the health of the civil population which will hold up production and our war effort?—Mr Brown There is a difficult situation as regards medical man power, and that is why the Shakespeare committee is sitting to determine priorities as between Service and civil needs—Sir F Sanderson Is it not a fact that the general conditions of health during war time are higher than during times of peace?—Mr Brown That is a rather wide and sweeping statement

Anti-typhus Precautions

Lieut Commander R L Tufnell asked the Secretary of State for War if arrangements were being made for the inspection of Oflag VI B, where the conditions were very bad with a view to some improvement being effected, and whether in view of the danger of the outbreak of an epidemic, of typhus or some similar disease, as a result of the bad conditions, he would consider sending supplies of anti-typhus serum to the camp—Captain H D R Margesson replied This camp has been visited four times since October by either the International Red Cross Committee or the Protecting Power The most recent visit was by the Protecting Power on Jan. 20, but a report on this visit has not yet been received A certain amount of improvement in the conditions at Oflag VI B has, however certainly taken place during this period, in particular brick huts are being built for the accommodation of prisoners and overcrowding has been reduced by moving a number of officers to other camps Medical supplies for the prevention and treatment of typhus have already been sent to Oflag VI B by the British Red Cross and some typhus vaccine has been sent to the International Red Cross Committee for the inoculation of British medical personnel in those camps where the International Red Cross Committee consider it necessary In addition the Protecting Power has reported that a formal assurance has been given by the responsible official of the German general staff that all measures for preventing the spread of the typhus epidemic have been taken. The precautions which have been taken in this country against typhus include a close watch by medical officers at ports and airports, the organisation and training of special mobile diagnostic and sanitary teams, arrangements for confirmatory diagnosis by experts, plans by local authorities for prompt isolation, hospital treatment and supervision of contacts, and a general intensification of delousing and cleansing of verminous conditions, for which local authorities have recently been given additional powers (Mr Brown replying to Mr W Leach)

Conditions in the Pottery Industry

Mr R D Denman asked the Minister of Labour the death-rate from silicosis in the pottery factories, in which he had approved the increase of hours of work for young persons under 16 years of age to 53 a week—Mr Ernest Bevin replied For the three years 1938–40 the average number of deaths from fibrosis of the lung (including silicosis) among persons who had been employed in the pottery industry was approximately 52, and the average age at death was between 59 and 60 I am advised that silicosis usually takes many years to develop and that the deaths now occurring are largely attributable to conditions which prevailed in the industry long ago, before the regulations were strengthened and various improvements made—Mr Denman Do not increased hours of work mean an increase in danger?—Mr Bevin I think that the way to treat silicosis is to make industrial conditions such that it cannot arise—Replying to Mr Rhys Davies, Mr Bevin said that he could not say whether there had been an annual increase or an annual decline

Mr Denman asked the Minister what steps, under section 99 of the Factories Act, 1937, examining surgeons were taking in respect of young persons under 16 years of age employed for 53 hours in pottery factories—Mr Bevin replied This section requires young persons under 16, on entering employment in a factory, to be examined by the examining surgeon as to their fitness for that employment It does not require a further examination if the hours of work are changed The inspectorate will, however, keep a special watch on the employment of young persons under 16 in potteries for more than 48 hours a week, and the position will be reviewed in three months' time

Qualification for War Pensions

Mr I C Hannah asked the Minister of Pensions whether a man passed into the Army A1 who subsequently broke down in health and was discharged was automatically entitled to his pension.—Sir W Womersley replied The disability must be certified by my medical advisers to be either directly attributable to service or to be, and remain, aggravated to a material extent thereby Where, in a man definitely passed as fit on recruitment or mobilisation for war service, effective service is found to have caused a degree of aggravation in a previously existing condition, the fact of discharge resulting from that condition would justify me in regarding the aggravation as material and thus bringing the case within the scope of the Royal Warrant There are, however, some cases in which it is not possible to certify that service has caused any worsening

National Health Insurance

Replying to a question Mr Brown gave the following NHI figures for Great Britain for 1940

Persons insured under the National Health Insurance Acts at the end of 1940	22 300 000
Total of NHI contributions paid during that year	£30,700,000
Weekly amounts of contributions of—	
employers	£300 000
workers	*£290,000
State contribution	£7,300,000

* Includes payments of voluntary contributors

The State contribution represents a seventh of the amount expended in 1940 on benefits and administration for men, and a fifth for women

Employment of Married Nurses

Mr David Adams asked the Minister of Labour whether, in view of the urgent need for nurses in many hospitals in the country, it was intended to direct fully qualified married nurses without children to take up this form of employment—Mr George Tomlinson replied In the case of married nurses, as of other married women, proper account must be taken of their domestic responsibilities Subject to such responsibilities, I feel sure that married nurses in general are prepared to make their services available but, if necessary, the Minister would be prepared to issue directions —Mr ADAMS Is the Parliamentary Secretary aware that a serious situation now prevails in regard to the shortage of nurses ? While it is true that some married nurses have volunteered, is he aware that large numbers are declining to volunteer, and in view of the urgency cannot directions be given as suggested ?—Mr TOMLINSON *That is not the* responsibility of my department —Mr G BUCHANAN Would it not be better to see that the conditions of employment are first made more attractive ?

Wheatmeal Bread in British Restaurants

Sir ERNEST GRAHAM-LITTLE asked the Parliamentary Secretary to the Ministry of Food whether he would arrange for the exclusive supply of natural wheatmeal bread in British Restaurants under his jurisdiction, as the Home Office and the Ministry of Health had taken this action in institutions under their control —Major G LLOYD GEORGE replied Local authorities have been asked to provide wheatmeal bread at British Restaurants It is being supplied at the majority and exclusively at some The Minister sees no reason to go further than this at the present time As regards the last part of the question, I shall be obliged if he will furnish me with particulars of the institutions to which he refers

Exemption of Women Doctors and Dentists

Captain G S ELLISTON asked the Minister of Labour whether he would amend the Employment of Women (Control of Engagements) Order 1942, made under the Defence Regulation 58A, to secure for doctors and dentists the same exemption as was allowed to nurses, teachers, &c , and thus avoid unnecessary disturbance of the established customs of the medical profession in regard to the filling of appointments and the arrangements now in operation by the Central Medical War Committee —Mr BEVIN replied After further consultation with the Minister of Health I am amending the order as suggested

Public Health

Experiment in School Feeding

IN a North Middlesex secondary school of 480 girls, a small experiment with the Oslo meal type of school dinner has been tried out since September, with success An average of 15–20 VIth, Vth and IVth form girls stay daily Their ages are 13–17, and their home circumstances vary from good to straitened, so they are a representative cross-section of the school

The first Oslo meal was a temporary expedient when the dining-hall was full, and a few girls stayed—with amusement and resignation—to a meal of cheese, salad, brown bread, baked potatoes, rusks and apples They were surprised to find how nice it tasted, and how comfortable they felt in the afternoon The experiment was talked about and a lesson on the Oslo meal given to each class Now the Oslo group come eagerly back after the holidays, saying how much they have missed the meal They feel they are pioneers and are keen to spread the idea, and convert mothers, aunts and neighbours The staple foods are salads in great variety, wheatmeal bread and vitaminised margarine, these are supplied ad lib About 2 oz raw green vegetable and 2 oz other vegetables make an average portion , 4–6 oz bread and 1–1½ oz margarine is usually eaten per head Milk, ⅓ pint, is taken daily and there are always some hard foods such as rusks, available to chew Protein foods served are grated cheese, sardines, liver paste (freshly prepared after 5 minutes cooking and served as Danish sandwiches), cold fried or baked herrings, cold sausages galantines, and salt cod as a mayonnaise with cod-liver oil added None of these foods has proved difficult to obtain Occasionally cold scrambled (dried) egg on 'Marmite' toast is served as a great treat

In winter, hot soup and jacket baked potatoes are added to the menu , extras are small dishes of radishes, sliced onion or leek, celery and carrot sticks, watercress, 'Bemax,' a simple salad dressing, or a glass of vegetable juice served as a cocktail "Afters" are more of a problem Something sweet is keenly appreciated Malt biscuits (using malt, whole meal and oatmeal flour) and malted home-made rusks are favourites , little jam turnovers, with wheatmeal flour, or apples, sultanas or prunes—dried or soaked—are usually given The rule is "protective foods only served" and cookery recipes have to be made to fit Soups are vitaminised with grated vegetables, chopped parsley and marmite added at the last moment All outer leaves and stalks of vegetables are washed and chopped, boiled up quickly just before serving and added to the soup Very little is wasted An average meal contains half a day's protein ration and has a calorie value of 1000–1200 Vitamin C is estimated at 55 mg and vitamin A 1100 international units For vitamin D we rely on herrings, sardines, salt cod, liver, cod-liver oil and margarine Iron and calcium foods are usually well represented As most of the girls have a re-heated dinner when they go home from school, protective foods are their greatest need

The meals are prepared in the cookery classes by the girls themselves and served in the kitchen Senior classes prepare the salad plates A typical one is a fish plate with small portions of herring, sardine, salt cod mayonnaise, shrimps or fried cod's roe, with cress and tomato and grated carrot and swede Another is a vegetarian plate with beans and mayonnaise or a brown sauce, and rissoles made from a well-known brand of vegetarian food or pulses, bemax and green salad and cress The advantage of salad plates is that new ideas can be tried and the children can taste a variety of foods and decide how much they like them Where a food is disliked by some children the waste is not large, and in practice it is usually eaten up by the others, unofficially The aim is to increase their repertoire of dishes, and give them the idea that food can be an adventure They are encouraged to discuss their food, why they are eating it and what they like and dislike If they do not care for a food alternative methods of serving it are tried until they are satisfied

Favourite salads are those with shredded raw cabbage, rather than lettuce , red cabbage and savoy are popular, and so are raw turnip tops, raw swedes, beetroot, carrot—cooked or raw—celery and turnip At first small quantities of salad were served grated carrot and cresses and celery, and a little raw cabbage Gradually the range was increased until the children became interested "What did you have today ?" inquire the others, as the Oslo group come out "Is there any left ?" is usually the next question The success of the salads is remarkable We are always assured that children will not eat them, but the shortage of fruit, especially of oranges, seems to have created an unconscious need for "protective" foods and the children are surprised at their own liking for salads "I never used to eat it," they often say A good deal depends on the serving Bright colours, careful seasoning, and arrangement make a dish look and taste attractive A salad must be blended, with soft and crisp textures mingled , too many crisp vegetables are tiring to chew Cabbages and sprouts must be finely shredded Vegetable juices poured over can make the protective value more concentrated

The meal is served in the school kitchen under the friendly management of VIth and Vth form girls The children prepare it, serve it, eat it and clear the meal away afterwards They manage their own meal entirely and social pressure is exerted on any newcomer who fusses about not liking brown bread or salads, or doesn't fancy raw beetroot, or cauliflower sprigs or a red soup The group remains unimpressed The price of the meal is 6*d* , usually the cost varies from 4½*d* to 5½*d* , any surplus is spent on stores or extras Little is spent on fuel and nothing on labour Preparation is simpler than in ordinary catering Soup is easily made , shredding and grating take time, using ordinary household graters, but this gives children good practice in handling tools Biscuits, oatcakes and rusks are made in quantity by afternoon classes and stored in tins Most of the meal is prepared well ahead of serving time, but salads are seasoned and arranged within the last half-hour because they lose crispness on standing There is no last minute rush to serve and cook, and kitchens remain cool and orderly Apparatus is simple a boiler and mashing sieve for soup, a mincer, graters, sharp knives, an oven, a frying pan and a steamer for galantines are the chief needs Staff can be untrained, but a capable dietitian cook is needed to act as forewoman

Letters to the Editor

SURGICAL INSTRUMENTS FOR RUSSIA

SIR,—I should like to thank my colleagues who sent instruments and appliances in response to my appeal for the use of surgeons with the Russian armies The response has been very generous, some two hundred parcels were received and the value of the gifts amounted to at least £3000 When the names of the donors have been available individual acknowledgement has been made, and Madame Maisky has herself insisted on sending a personal note

The need continues and if any of my colleagues still have surplus instruments they would be most gratefully accepted

ALFRED WEBB-JOHNSON
President Anglo Soviet Medical Committee

c/o The Royal Society of Medicine,
1, Wimpole Street, London, W 1

RELAPSING FEVER

SIR,—The discussion concluding the interesting account of a case of relapsing fever by Dr Stannus and Dr Bendit in your issue of Jan 24 may possibly leave a wrong impression One of the most striking features of the louse-borne form is the variation in the severity of the disease, not only as it affects individuals but also in the proportion of severe cases that occur in different epidemics The number of relapses appears to have no bearing on the differential diagnoses and varies in the louse-borne disease from 2 to 4 or 5 or more There is however no definite evidence that the case described was not one of ordinary louse-borne relapsing fever, and, in view of the danger of the importation of louse-borne diseases at the present time, cases of relapsing fever coming from Europe should be regarded as louse-borne and disinfestation of the patient and contacts carried out

Ministry of Health, S W 1 MELVILLE D MACKENZIE

THE PREMEDICAL CURRICULUM

SIR,—As a result of my teaching experience in the medical school and department of zoology in King's College, Newcastle, as well as from my contacts with teachers in several other universities, I have become convinced of the need for radical reform in the methods of teaching premedical subjects It is agreed that students should be instructed in the elements of biology, physics and chemistry but the matter and method are mainly left to the university departments concerned Many students and qualified medical men, however consider that these premedical scientific subjects, as taught, are largely irrelevant to medicine they fail to give that general background of scientific culture which should be their main object The medical schools, though mildly concerned over the lack of general background displayed by their students, have not made a determined effort to formulate a remedy They have been content to take the student as they find him and to make the best of a bad job The scientific departments consider the interests of medical students as subordinate to those of their own, and have given too little thought to making their subjects an integral part of medical education The average student regards the premedical subjects as a kind of formula to be mastered before he can gain entrance to a medical school, and he acquires the impression that medicine is not, thank God, a science

Surely whatever is taught him should leave him with a clear impression of what the subject as a whole is driving at, however much of the detail he forgets later At present he is treated as an intending specialist and presented with uncoordinated details the general implications of which are not discussed But necessary detail can always be more easily absorbed if from the very start, the wider significance of a subject is made clear Moreover, since medicine is in part applied biology, and biology entails study of the application of physics and chemistry to the problems of life, the student should be impressed with the interdependence of the three premedical subjects The three courses should be planned together as an integrated whole perhaps even in the form of a general science course This might begin with the theme of the circulation of matter and energy, whence the student could be introduced to the laws governing the transformation of different forms of energy and to the part played by living organisms in these processes The chemistry of oxidation and reduction, of hydrolysis and condensation, and of the chemical elements concerned would find a natural place in this scheme and the study of photosynthesis, respiration and fermentation would become an integral part of the whole On this foundation which could be elaborated to a suitable extent on the physical and chemical side, the biological superstructure could be built, and should finally lead to the consideration of man, his biological peculiarities and his place in the general scheme Man's exploitation of the natural flux of matter and energy by agriculture and industry would naturally be introduced as one of his characteristics Finally, though not necessarily at the end but rather at several appropriate points strong connecting links could be forged with medicine In a general survey of the manner in which chemical, physical and biological principles are applied in medicine the student would gain an idea of the whole field which he will subsequently cover

High Wycombe L C BEADLE

WAR-TIME NURSERIES

SIR,—Many of your readers will have much sympathy with the arguments of Dr Gilchrist and Dr Menzies (*Lancet*, Feb 7, p 185) A good case can certainly be made out for a mother looking after her own children but the difficulty is that many of these mothers do not want to stop at home to do so, moreover, the young wife who has recently worked in a factory is often a very efficient and valuable worker The war-time nursery is an alternative to some decrepit grannie with bleared eyes and septic teeth I hasten to add that the ordinary energetic grandmother whose dentures are beyond reproach is usually herself a worker and does not wish to give up her work in order to mind her grandchildren Thus from the child's point of view the war-time nurseries seem to be carrying out a desirable function, but the second serious argument is that of the labour wasted in looking after them I should like to suggest that the scheme put into practice by Dr James Fenton in Kensington is an excellent solution which might be copied elsewhere Relays of the young personnel from adjacent first-aid posts are working in four-hourly shifts as pupils in the nursery By arrangement with the National Society of Day Nurseries these girls are being trained for the nursery nurse's diploma so that when the war is over they will be ready to take up a useful career As far as the work of the nursery is concerned, they are proving ideal and are putting all the enthusiastic devotion with which they worked through the blitz into their care for their charges

In Kensington the war-time nurseries are thus carrying out a triple function in freeing young mothers for the war effort, giving proper care and education to their children and providing useful constructive work and a future career for the personnel of the first-aid posts The character of the work seems particularly felicitous for these young girls who have spent so long in the necessary but abnormal atmosphere of "first aid" and "anti-gas" and to whom we owe so much A supply of trained nursery nurses will always be an asset to the nation, and if the girl marries she will have received a useful dowry in her training

Kensington W 8 VIOLET RUSSELL

NOT SO STERILE LABELS

SIR,—It is generally recognised that the incidence of meningismus and meningitis following spinal analgesia has recently increased in this country While some of these cases are probably due to chemical irritation of the meninges from the injected drug, others have been proved to be infective, and various causes such as contamination of the water-supply have been blamed The purpose of this letter is to point out a possible source of infection which seems to be insufficiently recognised Before the war manufacturers used ampoules with particulars of their contents etched on the glass Such ampoules could readily be sterilised It appears, however that the etching process is no longer available, and makers have resorted to gumming printed labels on their ampoules It is, we believe, a common practice to immerse these ampoules in spirit in order to sterilise the outer surface We have found that after immersion for half an hour—a longer period than that sometimes employed—numerous bacteria can be cultivated from fluid in which the labels have subsequently been soaked off If, therefore, an ampoule so treated is placed in the same bowl of sterile water as the spinal needles and syringes, it will contaminate them, and if the ampoule is held in the hand it may infect the anæsthetist's gloves Exposure to formaldehyde vapour in a cabinet such as that used for sterilising catheters is apparently an effective method of sterilisation, but, since such a process is often impracticable, it would seem advisable to regard the outside of all labelled ampoules as frankly septic and make no attempt to sterilise them They can be held in a sterile towel or gauze, their necks etherised, nicked with a sterile file and snipped off The contained solution can then be drawn up into the syringe without fear of contamination A few organisms may not matter in subcutaneous or intravenous injections, in intrathecal ones they may prove fatal

Hill End Hospital
C LANGTON HEWER
LAWRENCE P GARROD

CORROSIVE STRICTURE OF THE STOMACH

SIR,—In reply to Mr Joll (*Lancet*, Oct 11 1941 p 439) I should like to state that partial gastrectomy has been performed for strictures, but authors who have had a relatively large experience in the treatment of burns of the stomach are still inclined to advise gastro-enterostomy rather than resection In analysing 34 cases, V Orator (*Zbl Chir* 1929, 56, 514) states that corrosive strictures are unsuitable for resection B Petrov (*Sovet Khir* 1935, No 6, p 106) reports 41 operations for burns of the stomach of 6 jejunostomies, all were fatal, of 31 gastro-enterostomies, 5 died, and of 4 resections, 1 died He concludes " The operation of choice in pyloric stenosis from burns is gastro-enterostomy, not resection " Mr Joll says that in his case there were no technical difficulties Petrov states that in many cases operation is very difficult because of adhesions and severe shrinking of the stomach under the left costal margin Here the transverse epigastric incision will probably give easier access than the longitudinal one

Ventersdorp, South Africa
C A R SCHULENBURG

CRUSH FRACTURES OF THE OS CALCIS

SIR,—The swing of the pendulum as it affects fashions in treatment is always worth watching I read with interest the paper by Mr Gray (*Lancet*, Jan 24, p 106) on the treatment of fractured os calcis Lucas-Championnière did not publish his work on the treatment of fractures by massage and mobilisation till 1895—long after he had begun to practise it regularly His teaching did not prove a success—first, because it was grossly abused, and secondly because it required constant supervision from the surgeon Yet there was no reason to condemn the method because it was abused by a faulty technique The pendulum then swung over to Bohler's treatment which, as practised in this country, only differed from the treatment given before the Lucas-Championniere method was advocated in the demand for perfect alignment In earlier days the doctrine of " good enough " had held sway, and Arbuthnot Lane and Bohler did good service by insisting on alignment The Lucas-Championniere treatment died from abuse, and Bohler's technique of unpadded plaster splinting will do the same His method requires not only perfect reduction and fixation in plaster, but elevation until all swelling has disappeared In England it would be impracticable at present to admit all patients with Colles's fractures, say, in order to ensure that the hand could be kept vertical until the fingers could move fully and no longer swelled when the arm was allowed to hang Elevation is an essential part of Bohler's treatment, and omitting it has been responsible for immeasurable damage Those with wide experience of fractures which have been treated in Bohler's way but without elevation realise the unnecessary labour, from a physical therapy point of view, and loss of time in recovery which result, and which are often totally out of proportion to the original injury Perfection may ultimately come by combining the teaching of Bohler and Lucas-Championniere The late Sir Robert Jones was content to use well-padded splints as a guard against undue pressure, not everybody can be trusted to apply a plaster splint to any fracture especially if the cast is to be unpadded This is a specialist job Even when perfection is attained it will repay the practitioner and patient in this country (whatever may be the case in Austria) if the period of immobilisation is reduced to a minimum, and physical treatment started at the earliest possible moment, this often means from the outset, provided that technique is satisfactory

London, N W 1
JAMES MENNELL

CONTROL OF RATS

SIR,—Your issue of Jan 31 (p 158) contained a valuable article by Mr Hardy on the control of rats The humanitarian aspect of any subject will not appear trivial to medical men, so may I call attention to the desirability of choosing humane methods whenever it is practicable to do so? Official advertisements have perhaps favoured the opposite choice by inculcating a kind of personal spite against rats—though to sensible people it will appear childish to speak as if the animals were intentionally harmful to mankind

Fumigation with hydrocyanic acid gas or with carbon monoxide (in exhaust gas from motor-cars or tractors) is unquestionably humane A good deal can be done by rat-proofing and destruction of breeding sites, in the manner described by Mr Hardy The breakback type of trap is usually, though not infallibly, humane, it is much cheaper than the wicked gin trap, contains much less metal, and is almost as efficient Cage traps should be of the kind that have a door at each end, so as to give a clear run, and should be inspected with the utmost regularity Unfortunately all the available poisons are exceedingly inhumane, and there is a strong case for research to find a humane and effective poison

284, Regent's Park Road,
London, N 3
C W HUME,
Hon Secretary, U F A W

UNWANTED INSTRUMENT CATALOGUES

SIR,—Peripatetic correspondent in your issue of Jan 17 (p 87) suggests that instrument catalogues, weighing anything up to 7 lb, when not wanted, should be patriotically given to the waste paper collection We venture to suggest unwanted catalogues should be returned to the publishing firm The time, labour and cost of printing of these works is a serious item of expenditure, although the fact that they are distributed free of charge on request to members of the medical profession gives a different impression This house receives many requests for copies of a catalogue to which it cannot accede owing to the activities of the Luftwaffe and the present impossibility of reprinting The return of all unwanted catalogues would be appreciated

DOWN BROS LTD
London, S E 1

GINGIVITIS IN THE FORCES

SIR,—Mr Coventry and I pointed out (*Lancet*, Jan 31, p 153) that military cases admitted to hospital suffering from gingivitis were found to be deficient in vitamin C, as judged by accepted standards Since I investigated those patients I have confirmed my findings by other methods of assessment of ascorbic acid nutrition We stated in our first letter that patients did not show clinical scurvy, but since then I have observed the frequency of associated symptoms which might be referable to vitamin-C insufficiency These have been mainly lethargy, ready fatigue, malaise and irritability of temper Further investigations indicate that low ascorbic acid values are by no means confined to cases of gingivitis Other patients with no apparent gum lesion or manifest signs of scurvy gave low figures of ascorbic acid nutrition If the patients studied reflect the general standard, then there seems to be a depression, lesser or greater, of vitamin-C nutrition in the Army Whether the hypovitaminosis is of sufficient degree to need remedying is a matter for careful consideration and large-scale assays My own opinion is that the men I examined had vitamin-C nutritional levels low enough to handicap them as soldiers and certainly to render them less efficient in combat

FREDERICK STUHL

Obituary

JOHN HARRY HEBB

KT C B , C B E , B M OXFD

Sir John Hebb, who died at Ronkswell Hospital, Worcester, on Feb 15, in his 64th year, received his medical education at Oxford going on to the Westminster Hospital as university scholar After qualifying in 1905 he was house-surgeon at the Westminster and house-physician at the Bethlem Royal Hospital He then went into private practice becoming assistant medical inspector of school-children for Oxfordshire During the late war he served with the RAMC in the Mediterranean Expeditionary Force reaching the rank of major and being awarded the O B E On his return he joined the medical staff of the Ministry of Pensions, succeeding Sir Lisle Webb as director-general in 1933 At the time when he should have assumed office he was gravely ill, and although he was subsequently able to take up his duties there can be little doubt that the impairment of his health which resulted contributed to the ultimate breakdown under the stress of his responsibilities in the last three years In 1928 he was created C B E , and in 1937 C B in recognition of his services with the Ministry of Pensions In this latter year he was appointed hon physician to the King, an appointment which he held until his retirement in 1941

Elliott & Fry

In the summer of 1938 Hebb was called upon to organise the Emergency Medical Services under the Ministry of Health, to which department he was seconded for this purpose The magnitude of the task was at once apparent, involving as it did the preparation of plans for dealing with an imminent declaration of war and the resultant treatment of casualties, and also a more elaborate and detailed scheme if, as happened, war was averted for the time being At the beginning of 1939 to his responsibilities for the provision of adequate hospital accommodation was added the supervision of plans for first-aid posts throughout the country But Hebb's superhuman energy was equal to the occasion The clinical arrangements for special types of casualties—neurosis, head and chest injuries, orthopædic cases—the supply of instruments, apparatus and drugs, the design of folding beds and stretchers, the planning of ward huts with all their ancillary buildings, all these received his personal and unremitting attention He never spared himself, and in 1940 he had an attack of coronary thrombosis from which he made a good recovery Characteristically he ignored the danger signal, and when in 1941 he retired with a knighthood he took the post of medical superintendent at the new Ronkswood Hospital, Worcester, and was putting the final touches preparatory to the reception of patients when a second attack proved fatal

Hebb had exceptional administrative ability, as was shown by his work at the Ministry of Pensions, and more particularly as director-general of Emergency Medical Services at the Ministry of Health The success this service has had is largely due to his initiative and driving power , it was a job after his own heart and he threw himself into it body and soul His genius for improvising in a few months a vast series of arrangements, which at the peace-time tempo would have taken a decade to complete, can be appreciated by those who took up the task when ill health compelled him to leave it He exacted hard work from his staff, but he worked harder than any of them himself His work was his life, and he died as he would have wished while still working for a coordinated system which may well have a profound influence on the hospital policy of this country for many years after the war

DAVID ANDERSON MILN

M R C S , SURGEON LIEUTENANT R N V R

Dr David Miln died in Malay on Jan 20 at the age of 26, from wounds received in an air-raid He was the only son of Mrs Miln and the late David Miln, barrister of Witcombe, Gloucestershire and Forest Hill, London He was educated at Alleyn School, Dulwich, where he won his colours for swimming and boxing In 1934 he went on to the London Hospital with a Price scholarship and before he qualified in 1939 he had many prizes to his credit After holding a house-appointment at his hospital he joined the R N V R in June 1940, and three months later he arrived at Singapore To begin with the comparative safety of his life and the routine which made up his work fretted him, but his letters to his mother show that he quickly decided that his contribution to the war must be to work hard at the job on hand and to seize his opportunities to study tropical medicine He had started to learn the Malayan language on his way out and soon he could speak it fluently, while his enthusiasm and energy soon started " quite a number of hares running " He obtained permission to attend operations, post-mortems and outpatient sessions at the Singapore General Hospital and he " found it heaven to get back to hospital medicine after the minor rubbish ' he saw all day He also began to work at the pathological department of the hospital which had been planned according to a scheme instituted by Professor Turnbull, and Miln found he was soon regarded as a sort of unofficial representative of his hospital and was expected to be ready to quote the opinions of " the London pundits " Meanwhile his official work had also increased and he found being the doctor of 1200 Malays was interesting and worth while He began to investigate cases of beriberi among them, and diagnosed his first case of leprosy At the end of last year his interest and work centred more and more round malaria, and when after various wanderings he returned to Singapore it was only to attend an antimalarial course and then set out up-country to work as a malaria control officer Shortly before his death he returned to report on a survey with which he had been entrusted and which he regarded as the most responsible job of his life

IAIN ALASDAIR MACMILLAN BEATON

B SC , M B GLASG , D P H , LIEUTENANT I M S

Dr Iain Beaton, who died on active service in India at the age of 28, was the elder son of Mr Donald Beaton of Kelvinside, Glasgow He was educated at Hillhead High School and the University of Glasgow where he graduated in science in 1934, and in medicine three years later His first resident posts were as house-gynæcologist at the Western Infirmary and as senior house-surgeon at the Glasgow Royal Maternity and Women's Hospital In 1938 he returned to the Western Infirmary to hold further house-appointment, and A J H , his chief, writes " Beaton had had considerable ' house ' experience and was more fully equipped than the usual house-surgeon He was of an inquiring mind, and although quiet in his manner he never hesitated to ask for information to clear up a point that was obscure to him His interest in his work and care in its performance leave a pleasant memory " Later Beaton was appointed medical officer at the Cleland County Hospital, Lanarkshire Last year after taking his D P H he entered the I M S as a temporary lieutenant He died from enteric fever at Rawalpindi on Jan 9 He leaves a widow

Lafayette

Messrs Burroughs Wellcome & Co are issuing ' Quinizarin ' in bottles of 100 g and 250 g The use of this compound as a diagnostic agent in the study of sweat secretion has been described in the *Journal of Neurology and Psychiatry* (1940 3, 197) to immerse these ampoules in spirit in order to sterilise the outer surface. We have found that after immersion for half an hour—a longer period than that sometimes employed—numerous bacteria can be cultivated from fluid in which the labels have subsequently been soaked off. If, therefore, an ampoule so treated is placed in the same bowl of sterile water as the spinal needles and syringes, it will contaminate them, and if the ampoule is held in the hand it may infect the anæsthetist's gloves. Exposure to formaldehyde vapour in a cabinet such as that used for sterilising catheters is apparently an effective method of sterilisation, but, since such a process is often impracticable, it would seem advisable to regard the outside of all labelled ampoules as frankly septic and make no attempt to sterilise them. They can be held in a sterile towel or gauze, their necks etherised, nicked with a sterile file and snapped off. The contained solution can then be drawn up into the syringe without fear of contamination. A few organisms may not matter in subcutaneous or intravenous injections, in intrathecal ones they may prove fatal.

Hill End Hospital. C LANGTON HEWER
LAWRENCE P GARROD

CORROSIVE STRICTURE OF THE STOMACH

SIR,—In reply to Mr Joll (*Lancet*, Oct 11 1941, p 439) I should like to state that partial gastrectomy has been performed for strictures, but authors who have had a relatively large experience in the treatment of burns of the stomach are still inclined to advise gastro-enterostomy rather than resection. In analysing 34 cases, V Orator (*Zbl Chir* 1929, 56, 514) states that corrosive strictures are unsuitable for resection. B Petrov (*Sovet Khir* 1935, No 6, p 106) reports 41 operations for burns of the stomach: of 6 jejunostomies, all were fatal, of 31 gastro-enterostomies, 5 died, and of 4 resections, 1 died. He concludes "The operation of choice in pyloric stenosis from burns is gastro-enterostomy, not resection." Mr Joll says that in his case there were no technical difficulties. Petrov states that in many cases operation is very difficult because of adhesions and severe shrinking of the stomach under the left costal margin. Here the transverse epigastric incision will probably give easier access than the longitudinal one.

Ventersdorp, South Africa. C A R SCHULENBURG

CRUSH FRACTURES OF THE OS CALCIS

SIR,—The swing of the pendulum as it affects fashions in treatment is always worth watching. I read with interest the paper by Mr Gray (*Lancet*, Jan 24, p 106) on the treatment of fractured os calcis. Lucas-Championnière did not publish his work on the treatment of fractures by massage and mobilisation till 1895—long after he had begun to practise it regularly. His teaching did not prove a success—first, because it was grossly abused, and secondly because it required constant supervision from the surgeon. Yet there was no reason to condemn the method because it was abused by a faulty technique. The pendulum then swung over to Bohler's treatment which, as practised in this country, only differed from the treatment given before the Lucas-Championniere method was advocated in the demand for perfect alignment. In earlier days the doctrine of "good enough" had held sway, and Arbuthnot Lane and Bohler did good service by insisting on alignment. The Lucas-Championniere treatment died from abuse, and Bohler's technique of unpadded plaster splinting will do the same. His method requires not only perfect reduction and fixation in plaster, but elevation until all swelling has disappeared. In England it would be impracticable at present to admit all patients with Colles's fractures, say, in order to ensure that the hand could be kept vertical until the fingers could move fully and no longer swelled when the arm was allowed to hang. Elevation is an essential part of Bohler's treatment, and omitting it has been responsible for immeasurable damage. Those with wide experience of fractures which have been treated in Bohler's way but without elevation realise the unnecessary labour, from a physical therapy point of view, and loss of time in recovery which result, and which are often totally out of proportion to the original injury. Perfection may ultimately come by combining the teaching of Bohler and Lucas-Championniere. The late Sir Robert Jones was content to use well-padded splints as a guard against undue pressure, not everybody can be trusted to apply a plaster splint to any fracture, especially if the cast is to be unpadded. This is a specialist job. Even when perfection is attained it will repay the practitioner and patient in this country (whatever may be the case in Austria) if the period of immobilisation is reduced to a minimum, and physical treatment started at the earliest possible moment, this often means from the outset, provided that technique is satisfactory.

London, N W 1. JAMES MENNELL

CONTROL OF RATS

SIR,—Your issue of Jan 31 (p 158) contained a valuable article by Mr Hardy on the control of rats. The humanitarian aspect of any subject will not appear trivial to medical men, so may I call attention to the desirability of choosing humane methods whenever it is practicable to do so? Official advertisements have perhaps favoured the opposite choice by inculcating a kind of personal spite against rats—though to sensible people it will appear childish to speak as if the animals were intentionally harmful to mankind.

Fumigation with hydrocyanic acid gas or with carbon monoxide (in exhaust gas from motor-cars or tractors) is unquestionably humane. A good deal can be done by rat-proofing and destruction of breeding sites, in the manner described by Mr Hardy. The breakback type of trap is usually, though not infallibly, humane, it is much cheaper than the wicked gin trap, contains much less metal, and is almost as efficient. Cage traps should be of the kind that have a door at each end so as to give a clear run, and should be inspected with the utmost regularity. Unfortunately all the available poisons are exceedingly inhumane, and there is a strong case for research to find a humane and effective poison.

284, Regent's Park Road,
London, N 3.
C W HUME,
Hon Secretary, U F A W

UNWANTED INSTRUMENT CATALOGUES

SIR,—Peripatetic correspondent in your issue of Jan 17 (p 87) suggests that instrument catalogues, weighing anything up to 7 lb, when not wanted, should be patriotically given to the waste paper collection. We venture to suggest unwanted catalogues should be returned to the publishing firm. The time, labour and cost of printing of these works is a serious item of expenditure, although the fact that they are distributed free of charge on request to members of the medical profession gives a different impression. This house receives many requests for copies of a catalogue to which it cannot accede owing to the activities of the Luftwaffe and the present impossibility of reprinting. The return of all unwanted catalogues would be appreciated.

London, S E 1. DOWN BROS LTD

GINGIVITIS IN THE FORCES

SIR,—Mr Coventry and I pointed out (*Lancet*, Jan 31, p 153) that military cases admitted to hospital suffering from gingivitis were found to be deficient in vitamin C, as judged by accepted standards. Since I investigated those patients I have confirmed my findings by other methods of assessment of ascorbic acid nutrition. We stated in our first letter that patients did not show clinical scurvy, but since then I have observed the frequency of associated symptoms which might be referable to vitamin-C insufficiency. These have been mainly lethargy, ready fatigue, malaise and irritability of temper. Further investigations indicate that low ascorbic acid values are by no means confined to cases of gingivitis. Other patients with no apparent gum lesion or manifest signs of scurvy gave low figures of ascorbic acid nutrition. If the patients studied reflect the general standard, then there seems to be a depression, lesser or greater, of vitamin-C nutrition in the Army. Whether the hypovitaminosis is of sufficient degree to need remedying is a matter for careful consideration and large-scale assays. My own opinion is that the men I examined had vitamin-C nutritional levels low enough to handicap them as soldiers and certainly to render them less efficient in combat.

FREDERICK STUHL

Obituary

JOHN HARRY HEBB

KT C B, C B E, B.M OXFD

Sir John Hebb, who died at Ronkswell Hospital, Worcester, on Feb 15, in his 64th year, received his medical education at Oxford going on to the Westminster Hospital as university scholar After qualifying in 1905 he was house-surgeon at the Westminster and house-physician at the Bethlem Royal Hospital He then went into private practice becoming assistant medical inspector of school-children for Oxfordshire During the late war he served with the RAMC in the Mediterranean Expeditionary Force reaching the rank of major and being awarded the O B E On his return he joined the medical staff of the Ministry of Pensions, succeeding Sir Lisle Webb as director-general in 1933 At the time when he should have assumed office he was gravely ill, and although he was subsequently able to take up his duties there can be little doubt that the impairment of his health which resulted contributed to the ultimate breakdown under the stress of his responsibilities in the last three years In 1928 he was created C B E, and in 1937 C B in recognition of his services with the Ministry of Pensions In this latter year he was appointed hon physician to the King, an appointment which he held until his retirement in 1941

Elliott & Fry

In the summer of 1938 Hebb was called upon to organise the Emergency Medical Services under the Ministry of Health, to which department he was seconded for this purpose The magnitude of the task was at once apparent, involving as it did the preparation of plans for dealing with an imminent declaration of war and the resultant treatment of casualties, and also a more elaborate and detailed scheme if, as happened, war was averted for the time being At the beginning of 1939 to his responsibilities for the provision of adequate hospital accommodation was added the supervision of plans for first-aid posts throughout the country But Hebb's superhuman energy was equal to the occasion The clinical arrangements for special types of casualties—neurosis, head and chest injuries, orthopædic cases—the supply of instruments, apparatus and drugs, the design of folding beds and stretchers, the planning of ward huts with all their ancillary buildings, all these received his personal and unremitting attention He never spared himself, and in 1940 he had an attack of coronary thrombosis from which he made a good recovery Characteristically he ignored the danger signal, and when in 1941 he retired with a knighthood he took the post of medical superintendent at the new Ronkswood Hospital, Worcester, and was putting the final touches preparatory to the reception of patients when a second attack proved fatal

Hebb had exceptional administrative ability, as was shown by his work at the Ministry of Pensions, and more particularly as director-general of Emergency Medical Services at the Ministry of Health The success this service has had is largely due to his initiative and driving power, it was a job after his own heart and he threw himself into it body and soul His genius for improvising in a few months a vast series of arrangements, which at the peace-time tempo would have taken a decade to complete, can be appreciated by those who took up the task when ill health compelled him to leave it He exacted hard work from his staff, but he worked harder than any of them himself His work was his life, and he died as he would have wished while still working for a coordinated system which may well have a profound influence on the hospital policy of this country for many years after the war

DAVID ANDERSON MILN

M R C S, SURGEON LIEUTENANT R N V R

Dr David Miln died in Malaya on Jan 20 at the age of 26, from wounds received in an air-raid He was the only son of Mrs Miln and the late David Miln, barrister of Witcombe, Gloucestershire and Forest Hill, London He was educated at Alleyn School, Dulwich where he won his colours for swimming and boxing In 1934 he went on to the London Hospital with a Price scholarship and before he qualified in 1939 he had many prizes to his credit After holding a house-appointment at his hospital he joined the R N V R in June 1940, and three months later he arrived at Singapore To begin with the comparative safety of his life and the routine which made up his work fretted him, but his letters to his mother show that he quickly decided that his contribution to the war must be to work hard at the job on hand and to seize his opportunities to study tropical medicine He had started to learn the Malayan language on his way out and soon he could speak it fluently, while his enthusiasm and energy soon started "quite a number of hares running" He obtained permission to attend operations, post-mortems and outpatient sessions at the Singapore General Hospital and he "found it heaven to get back to hospital medicine after the minor rubbish" he saw all day He also began to work at the pathological department of the hospital which had been planned according to a scheme instituted by Professor Turnbull, and Miln found he was soon regarded as a sort of unofficial representative of his hospital and was expected to be ready to quote the opinions of "the London pundits" Meanwhile his official work had also increased and he found being the doctor of 1200 Malays was interesting and worth while He began to investigate cases of beriberi among them, and diagnosed his first case of leprosy At the end of last year his interest and work centred more and more round malaria, and when after various wanderings he returned to Singapore it was only to attend an antimalarial course and then set out up-country to work as a malaria control officer Shortly before his death he returned to report on a survey with which he had been entrusted and which he regarded as the most responsible job of his life

IAIN ALASDAIR MACMILLAN BEATON

B SC, M B GLASG, D P H, LIEUTENANT I M S

Dr Iain Beaton, who died on active service in India, at the age of 28, was the elder son of Mr Donald Beaton of Kelvinside, Glasgow He was educated at Hillhead High School and the University of Glasgow where he graduated in science in 1934, and in medicine three years later His first resident posts were as house-gynæcologist at the Western Infirmary and as senior house-surgeon at the Glasgow Royal Maternity and Women's Hospital In 1938 he returned to the Western Infirmary to hold further house-appointment, and A J H, his chief, writes "Beaton had had considerable 'house' experience and was more fully equipped than the usual house-surgeon He was of an inquiring mind and although quiet in his manner he never hesitated to ask for information to clear up a point that was obscure to him His interest in his work and care in its performance leave a pleasant memory" Later Beaton was appointed medical officer at the Cleland County Hospital, Lanarkshire Last year after taking his D P H he entered the I M S as a temporary lieutenant He died from enteric fever at Rawalpindi on Jan 9 He leaves a widow

Lafayette

Messrs BURROUGHS WELLCOME & Co are issuing 'Quinizarin' in bottles of 100 g and 250 g The use of this compound as a diagnostic agent in the study of sweat secretion has been described in the *Journal of Neurology and Psychiatry* (1940 3 107) to immerse these ampoules in spirit in order to sterilise the outer surface We have found that after immersion for half an hour—a longer period than that sometimes employed—numerous bacteria can be cultivated from fluid in which the labels have subsequently been soaked off If, therefore, an ampoule so treated is placed in the same bowl of sterile water as the spinal needles and syringes, it will contaminate them, and if the ampoule is held in the hand it may infect the anæsthetist's gloves Exposure to formaldehyde vapour in a cabinet such as that used for sterilising catheters is apparently an effective method of sterilisation, but, since such a process is often impracticable, it would seem advisable to regard the outside of all labelled ampoules as frankly septic and make no attempt to sterilise them They can be held in a sterile towel or gauze, their necks etherised, nicked with a sterile file and snapped off The contained solution can then be drawn up into the syringe without fear of contamination A few organisms may not matter in subcutaneous or intravenous injections, in intrathecal ones they may prove fatal

Hill End Hospital C LANGTON HEWER
LAWRENCE P GARROD

CORROSIVE STRICTURE OF THE STOMACH

SIR,—In reply to Mr Joll (*Lancet*, Oct 11 1941, p 439) I should like to state that partial gastrectomy has been performed for strictures, but authors who have had a relatively large experience in the treatment of burns of the stomach are still inclined to advise gastro-enterostomy rather than resection In analysing 34 cases, V Orator (*Zbl Chir* 1929, 56, 514) states that corrosive strictures are unsuitable for resection B Petrov (*Sovet Khir* 1935, No 6, p 106) reports 41 operations for burns of the stomach of 6 jejunostomies, all were fatal, of 31 gastro-enterostomies, 5 died, and of 4 resections, 1 died He concludes "The operation of choice in pyloric stenosis from burns is gastro-enterostomy, not resection" Mr Joll says that in his case there were no technical difficulties Petrov states that in many cases operation is very difficult because of adhesions and severe shrinking of the stomach under the left costal margin Here the transverse epigastric incision will probably give easier access than the longitudinal one

Ventersdorp, South Africa C A R SCHULENBURG

CRUSH FRACTURES OF THE OS CALCIS

SIR,—The swing of the pendulum as it affects fashions in treatment is always worth watching I read with interest the paper by Mr Gray (*Lancet*, Jan 24, p 106) on the treatment of fractured os calcis Lucas-Championnière did not publish his work on the treatment of fractures by massage and mobilisation till 1895—long after he had begun to practise it regularly His teaching did not prove a success—first, because it was grossly abused, and secondly because it required constant supervision from the surgeon Yet there was no reason to condemn the method because it was abused by a faulty technique The pendulum then swung over to Bohler's treatment which, as practised in this country, only differed from the treatment given before the Lucas-Championniere method was advocated in the demand for perfect alignment In earlier days the doctrine of "good enough" had held sway, and Arbuthnot Lane and Bohler did good service by insisting on alignment The Lucas-Championniere treatment died from abuse, and Bohler's technique of unpadded plaster splinting will do the same His method requires not only perfect reduction and fixation in plaster, but elevation until all swelling has disappeared In England it would be impracticable at present to admit all patients with Colles's fractures, say, in order to ensure that the hand could be kept vertical until the fingers could move fully and no longer swelled when the arm was allowed to hang Elevation is an essential part of Bohler's treatment, and omitting it has been responsible for immeasurable damage Those with wide experience of fractures which have been treated in Bohler's way but without elevation realise the unnecessary labour, from a physical therapy point of view, and loss of time in recovery which result, and which are often totally out of proportion to the original injury Perfection may ultimately come by combining the teaching of Bohler and Lucas-Championniere The late Sir Robert Jones was content to use well-padded splints as a guard against undue pressure, not everybody can be trusted to apply a plaster splint to any fracture, especially if the cast is to be unpadded This is a specialist job Even when perfection is attained it will repay the practitioner and patient in this country (whatever may be the case in Austria) if the period of immobilisation is reduced to a minimum, and physical treatment started at the earliest possible moment, this often means from the outset, provided that technique is satisfactory

London, N W 1 JAMES MENNELL

CONTROL OF RATS

SIR,—Your issue of Jan 31 (p 158) contained a valuable article by Mr Hardy on the control of rats. The humanitarian aspect of any subject will not appear trivial to medical men, so may I call attention to the desirability of choosing humane methods whenever it is practicable to do so? Official advertisements have perhaps favoured the opposite choice by inculcating a kind of personal spite against rats—though to sensible people it will appear childish to speak as if the animals were intentionally harmful to mankind.

Fumigation with hydrocyanic acid gas or with carbon monoxide (in exhaust gas from motor-cars or tractors) is unquestionably humane A good deal can be done by rat-proofing and destruction of breeding-sites, in the manner described by Mr Hardy The breakback type of trap is usually, though not infallibly, humane, it is much cheaper than the wicked gin trap, contains much less metal, and is almost as efficient Cage traps should be of the kind that have a door at each end, so as to give a clear run, and should be inspected with the utmost regularity Unfortunately all the available poisons are exceedingly inhumane, and there is a strong case for research to find a humane and effective poison

284, Regent's Park Road,
London, N 3
C W HUME,
Hon Secretary, U F A W

UNWANTED INSTRUMENT CATALOGUES

SIR,—Peripatetic correspondent in your issue of Jan 17 (p 87) suggests that instrument catalogues, weighing anything up to 7 lb, when not wanted, should be patriotically given to the waste paper collection We venture to suggest unwanted catalogues should be returned to the publishing firm The time, labour and cost of printing of these works is a serious item of expenditure, although the fact that they are distributed free of charge on request to members of the medical profession gives a different impression This house receives many requests for copies of a catalogue to which it cannot accede owing to the activities of the Luftwaffe and the present impossibility of reprinting The return of all unwanted catalogues would be appreciated

London, S E.1 DOWN BROS LTD

GINGIVITIS IN THE FORCES

SIR,—Mr Coventry and I pointed out (*Lancet*, Jan 31, p 153) that military cases admitted to hospital suffering from gingivitis were found to be deficient in vitamin C, as judged by accepted standards Since I investigated those patients I have confirmed my findings by other methods of assessment of ascorbic acid nutrition We stated in our first letter that patients *did not* show clinical scurvy, but since then I have observed the frequency of associated symptoms which might be referable to vitamin-C insufficiency These have been mainly lethargy, ready fatigue, malaise and irritability of temper Further investigations indicate that low ascorbic acid values are by no means confined to cases of gingivitis Other patients with no apparent gum lesion or manifest signs of scurvy gave low figures of ascorbic acid nutrition If the patients studied reflect the general standard, then there seems to be a depression, lesser or greater, of vitamin-C nutrition in the Army Whether the hypovitaminosis is of sufficient degree to need remedying is a matter for careful consideration and large-scale assays My own opinion is that the men I examined had vitamin-C nutritional levels low enough to handicap them as soldiers and certainly to render them less efficient in combat

FREDERICK STUHL

HEALTH OF CAPE TOWN

WITH an equable climate, an average of 3000 sunshine hours a year, complete absence of local tropical diseases, nd on the whole a well-to-do European community, Cape Town should be a healthy place, and so it is for Europeans. But it is a sorry picture that Dr Shadick Higgins paints of he non-Europeans, usually classed as Cape Coloured, who constitute just over half of a total population of 300,000. n his report for 1939–40 he says that 57% of the coloured deaths were under the age of 25, tuberculosis has become very prevalent and venereal diseases are rife. The general incidence of notified tuberculosis among the coloured was 7·08 per 1000, against the European incidence of 1·14 per 1000, and the disease seems to run a particularly rapid course in the coloured. In the year 3483 new cases attended for treatment at the venereal disease clinic and of these 2714 were Cape Coloured, making the incidence of treated cases among them 17·6 per 1000. Moreover, half the new patients were suffering from syphilis. Dr Higgins shows how much social and economic conditions are to blame. Some of the coloured are skilled workers, but the majority are labourers, many of them earning under 30*s* a week. Overcrowding and undernourishment are inevitable. To show the effects of overcrowding the tuberculosis officer points out that 55·8% of coloured contacts of tuberculosis examined had the same disease; and in a series of 81 cases of tuberculous meningitis an "open" case of tuberculosis had been in contact with the patient in 23. But great improvements were being made when the war began. Large council housing schemes for the coloured were being built in the "Flats" or suburbs, with low rentals and cheap transport. The native location has its own small hospital with nursing staff and medical personnel. Maternity and child-welfare organisations were well established and their services were being extended, and special nurseries for toddlers had been started. Undernourishment was being met to some extent by free milk and meals for the poor and the sale of state-subsidised butter, of which nearly a million pounds had been sold. The incidence of enteric fever in 1939–40 was the lowest on record and there were no deaths from measles or scarlet fever. The incidence of diphtheria too had fallen considerably, but there was still a striking difference in the fatality of European and coloured cases (3·1% for Europeans and 15·4% for non-Europeans). In spite of the overcrowding there were only 35 cases of cerebrospinal fever. Dr Higgins hopes that the low cultural standards among the coloured can be raised by extending education and adding other social amenities. He points out that there is no national health insurance scheme in South Africa for them. He has started using coloured health visitors and is impressed by the experiment. With a large hospital catering only for coloured established at Cape Town there are now facilities for the training of such coloured nurses and they will play an important rôle in future public-health work. The problems of the coloured of Cape Town are much the same as those which face medical officers of health in all native, Asiatic and other crowded communities, and Dr Higgins's experience will repay careful study.

DOCTOR IN THE LIONS' DEN

ARMENIA, the first country to adopt Christianity as the state religion in AD 302, is a country which has suffered wars and persecutions for many centuries. Situated between Europe and Asia, it has been attacked by Persians, Mongols, Romans, Saracens and Turks. The latter carried on the traditional persecution of the "infidel" Armenian Christians until after the last war. The recurrent massacres and atrocities perpetrated on the Armenians by the Turks exceeded in barbarity the pogroms of the Orthodox Russians against the Jews before 1917. Against such a background, general practice in Turkey by an Armenian physician was likely to be precarious. Dr Avedis Nakashian, who has recorded his adventures in his autobiography,[1] found this out for himself. He was educated at the American Missionary College at Aintab and later studied medicine at Beirut, where he qualified in 1891. From then until 1922 he practised in Turkey. He made the most of his opportunities and being one of the few properly trained doctors in the country he was able to acquire plenty of surgical experience. He would set up his surgery in any town or village he visited in Eastern Turkey and rich and poor would flock to him for treatment. He took big fees from the rich but treated the poor free. He attended governors, sheiks, or bandit chiefs with equal readiness, but on several occasions, although he always steered clear of politics, he had to pack his bag hurriedly and flee to a more friendly locality. With the upheavals following the last war, culminating in the defeat of the Greek army in Anatolia and the burning of Smyrna, Dr Nakashian decided that it was too dangerous for him to stay any longer in Turkey, so he made his way to America. There in 1924, after unhappy experiences on Ellis Island, he "mingled with the happy and free millions of New Yorkers, safe in the melting pot of Uncle Sam."

Dr Nakashian's book is naïvely written and some of his stories show traces of oriental embroidery, but he gives an interesting picture of life in Turkey during the first quarter of this century. If one can read the doctor through his book, he is not only a competent surgeon, but has that sympathetic understanding of human nature which is the mark of the true physician.

ACUTE INTESTINAL OBSTRUCTION

IN his Honyman Gillespie lecture in Edinburgh on Feb. 19 Mr K. PATERSON BROWN, F.R.C.S.E., discussed acute intestinal obstruction from the clinical standpoint, restricting himself to postoperative obstruction. Such obstructions, he said, are usually the result of adhesions, peritonitis, or a combination of the two. Those due to adhesions may develop soon after the abdominal exploration or be long delayed. In the former case obstruction is usually of the simple mechanical type, but when a considerable time has elapsed before symptoms appear there is a greater likelihood of a strangulation. When peritonitis is the primary cause paralytic ileus may set in, accompanied in high obstruction with rapid distension and colic and copious vomiting. When the lower ileum is obstructed some absorption of digestive juices is possible and distension is more gradual; but there is increased intestinal secretion and venous stasis leading to œdema of the bowel. Eventually a paralysis is imposed on the mechanical obstruction. Vomiting may be early but is often delayed until gross distension has developed. He explained that in both types there is great loss of water and electrolyte—in high obstruction by vomiting, in low obstruction by accumulation within the distended bowel. In high obstructions chloride loss is great, and hypochloræmia and alkalosis are added to dehydration. In low obstructions the chloride loss is not so great and ketosis may be added to dehydration. He did not suggest that a disturbance of water and salt balance is the only factor militating against recovery in acute intestinal obstruction, but it certainly plays an important part in causing serious deterioration. Under normal conditions an individual loses each day 1000–1500 c.cm. of water in vaporisation from skin and lungs, a small amount from the fæces and 600–1500 c.cm. in the urine. It has been estimated that the surgical patient requires about 3500 c.cm. of fluid a day. In the postoperative phase it may not be possible to give any by mouth. The abnormal losses of intestinal obstruction must also be replaced, and this sometimes entails the administration of enormous quantities of fluid—10 or more litres in 24 hours. Replenishment of lost chloride is also vital and determinations of the plasma chloride concentration are helpful. He quoted the work of Bingham and Bartlett, who have suggested a clinical rule for estimating the chloride requirements: if the plasma chloride level is known, then for every 100 mg. that the plasma chloride needed to raise it to normal 0·2 g. of salt per 1 lb. of body weight must be given. If excessive sodium chloride is given, it may cause œdema, and if the patient still requires fluid after the plasma chlorides have been restored to normal it must be given in the form of 5% glucose in water; hypertonic saline is unsatisfactory and dangerous for a patient in this state.

In paralytic ileus, he said, conservative measures for the treatment of obstruction are chiefly applicable, but the surgeon must be certain he is not missing a strangulation. It is better to prevent paralytic ileus than to

---

[1] A Man who Found a Country. Dr A. Nakashian. London: Allen and Unwin. Pp. 279. 12s. 6d.

Notes, Comments and Abstracts

CIVILIAN CONVALESCENT TREATMENT

J OWEN REID, M D EDIN
MEDICAL SUPERINTENDENT TO THE PRINCESS MARY'S L C C HOSPITAL MARGATE

FOR some time past lack of adequate convalescent facilities for civilians has caused concern Many of the usual peace-time arrangements are no longer available A public-health official recently informed me that "convalescence might be regarded as an unnecessary luxury in war-time" Nothing, I believe, could be further from the truth In these days of increased mental and physical strain, when holidays are reduced to a minimum, when many people are working for long hours in factories, and when the normal comforts of home life are reduced, recuperation under skilled supervision is necessary to hasten the return of the sick to the bench and lathe This could be fully supplied by the provision of convalescent hospitals The principle has already been applied by the Army in their convalescent camps, and civilians, now sharing the front line, deserve equal benefits

The words "convalescent hospital" embody a new conception of convalescent treatment which differentiates an institution so designated, and equipped for the purpose, from the multitudinous establishments of varying repute grouped under the traditional term "convalescent home" The prime functions of the convalescent hospital are to provide every possible form of medical treatment required by a patient from the moment he is fit to be moved from a general hospital, and to restore him to health in the shortest possible time This would materially hasten the turnover in the parent hospitals

ACCOMMODATION AND STAFFING

The convalescent hospital of the future should be situated in pleasant country surroundings or at the seaside, preferably on the outskirts of a small town, so that patients in their free time are not severed from civilisation The sexes should have separate hospitals, and children should be treated in an institution set apart for them It would, I think, greatly add to efficiency and ease of control were such hospitals limited to about 350 beds

The buildings must be comfortably furnished, with ample accommodation for reading, writing and recreation Various therapeutic units should be provided, among them a massage department of liberal dimensions Patients always appreciate small wards containing 4–6 beds, because these confer a degree of privacy and enable friends, or similar types of patient, to be housed together Adequate sick-ward accommodation is essential Our experience at Margate showed that about a tenth of the patients admitted passed through the sick-ward at some period of their stay A few extra beds for isolation must also be provided The grounds should be attractive and provide adequate space for recreation

Staffing must be on lines similar to those of a general hospital but the ratio of trained to untrained nursing staff can be lower At the same time the wards must be adequately covered by trained staff, and it should be borne in mind that convalescence for patients does not imply convalescence for the staff The hospital must be able to meet every modern therapeutic need but should not be called on to deal with acute surgery because patients requiring immediate operation can always be transferred to a neighbouring general hospital A first-class massage department is indispensable, and must incorporate electrical treatment, diathermy, artificial sunlight, infrared therapy and remedial exercises Classes for physical exercises must be formed in several groups so that patients may progressively graduate from the elementary to the more advanced Such measures applied to chest diseases are beneficial, patients with heart disease and those with abdominal wounds, particularly hernias, can also be given a series of carefully graduated exercises All such classes must be conducted by skilled instructors under medical supervision At Margate, a policy of centralising all surgical dressings in a special department was found convenient, saving time in the wards and economising materials and instruments All patients knew the hours at which they were to attend and there were no lengthy periods of

Throughout convalescence radiological are desirable in many disorders and essential in For example, with diseases of the respiratory efficient control of cases in the recovery stages of monia, empyema or lobectomy often calls for examinations, and the same is true of many diseases other systems The medicolegal aspect makes advisable that all injuries sustained by patients should X rayed immediately

Patients should be dissuaded from taking med they do not need This may be difficult, for the masses have an inborn faith in the bottle of medicine Much of the convalescent hospital's success will depend on the culinary arrangements, diets should be suitable and meals attractive Variety stimulates that keenness of appetite and enjoyment of food associated in the mind of the convalescent with the return to normal health Dining rooms must be warm and comfortable with separate tables seating six or eight Food should be daintily served and service prompt and courteous Patients on a special diet must be seated apart from the other General supervision will be facilitated if patients occupy the same seats during the whole of their stay This makes it easy to check attendances, which must be compulsory at all meals except afternoon tea The day must not start too early Breakfast should be about 8 15 A M—a late hour in hospital routine

Entertainment is an important psychotherapeutic factor in convalescence, diverting the mind from infirmity of the body Patients must never be allowed to become bored An established but varied routine which fills the day while leaving the afternoon free is helpful This applies especially to the evenings, when all patients must be within the precincts of the hospital and not wandering about the countryside Concerts, cinematograph shows games and an occasional dance provide a pleasant ending to a day which should finish with bed for all by 9 30 P M During the day much can be done to provide varied diversions At Margate, we used to run charabanc excursions twice a week for most of the year and a steamer trip once weekly during the summer Most patients enjoy a modern library and there must be a liberal supply of newspapers, periodicals and indoor games in the reading- and recreation-rooms All such arrangements can be controlled by a competent recreation officer Occupational therapy, in comfortable and suitable workrooms, must be encouraged Interest can be stimulated by awarding small prizes, say once a fortnight, for the best articles in the various handiwork groups

As much freedom as possible must be allowed provided treatment comes first With afternoons free the patients are generally well contented Irksome and petty restrictions must be avoided, at Margate, we had no rules but rather instructions for the guidance of patients Such freedom restores not only a sense of self reliance and responsibility, but helps to eliminate any subconscious desire for continued invalidism

The closest possible liaison must be established between the convalescent hospital and the group of institutions it serves Meetings and discussions between the medical staffs must be frequent and full notes sent and returned with every patient Each hospital must work as part of a system entirely devoted to the restoration of health It is to be hoped that a scheme on these lines will be seriously considered by those responsible for the present and future development of the hospital services in this country

I am indebted to the Medical Officer of Health of the London County Council for permission to publish this paper These observations are made from experience gained during the development of the council's policy of convalescent hospital treatment

---

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES —A meeting of this society will be held at 11, Chandos Street, London, W 1, on Saturday, Feb 28, at 2 P M, when Captain C S Nicol will read a paper on pyrototherapy by intravenous TAB vaccine in the treatment of gonorrhœa and non gonococcal urethritis The next meeting will take place on March 28, when Colonel L W Harrison will open a discussion on methods of enlightenment of the general public on venereal diseases

ORIGINAL ARTICLES

CONTINUOUS METHOD OF DRYING PLASMA AND SERUM

JOHN F WILKINSON,
M D MANC, PH.D, F R C P, F I C
PHYSICIAN IN CHARGE AND DIRECTOR OF THE DEPARTMENT OF CLINICAL INVESTIGATIONS AND RESEARCH, ROYAL INFIRMARY AND UNIVERSITY OF MANCHESTER, REGIONAL TRANSFUSION OFFICER E M S

KENNETH BULLOCK,
PH.D MANC, F I C, PH C
LECTURER IN PHARMACY, UNIVERSITY OF MANCHESTER

WILLIAM COWEN,
M SC MANC, A.M I CHEM.E
SENIOR LECTURER IN CHEMICAL ENGINEERING, MANCHESTER COLLEGE OF TECHNOLOGY

IN an earlier communication Aylward and others[1] considered the question of concentration and drying of plasma and the advantages of the desiccated preparations so obtained, especially their stability, economy in storage, ease of transport, and use in the preparation of concentrated plasma Plasma and serum can be quite readily desiccated in small quantities by several methods, but on the larger scale many difficulties arise . the serum or plasma proteins are easily denatured, and sterility is not easy to maintain on larger apparatus, which is also very expensive to install and run. This paper indicates how these difficulties can be overcome and describes an economical, continuous process of spray-drying which can be adapted to large-scale use

In 1872 Samuel R Percy of New York City patented a "method of atomising and desiccating fluid and solid substances, also viscous substances containing water, by the use of dried, heated or cooled air or gas which forces the substance into atoms ; the atoms being thrown forward and forced into a chamber and dried in consequence of the dried and heated air which propels them into the chamber and also owing to the dried and heated state of the chamber into which they are thrown" (U.S Patent No 125406)

Owing to the very rapid desiccation resulting and the fact that substances are much more stable to heat in the desiccated condition, spray-drying has been found suitable for the drying of heat-sensitive materials , thus, it has a wide commercial application in the production of dried milk. Two of us (J. F W and K. B) have already demonstrated the increased stability of the heat-labile preparations of stomach containing the sensitive enzyme hæmopoietin, after desiccation, while as far back as 1932 we also examined samples of spray-dried whole blood.

Probably the first mention of spray-drying of blood is in Stauf's patent (U.S Patent No 666711, dated 1901) which claims "a process of obtaining the solid constituents of liquids such as blood, milk, and the like in the form of powder, the said process consisting in converting the liquid into a fine spray, bringing such spray or atomised liquid into a regulated current of heated air so that the liquid constituents are completely vaporised, conveying the dry powder into a suitable collecting space away from the air current and discharging the air and vapour separately from the dry powder ' Many variations have been tried by altering the shapes and sizes of drying chamber and collecting apparatus, spraying from the bottom with an upward current of air, or from the top with a downward current of air, and using either stationary or centrifugal rotary atomisers

When we first investigated the possibility of spray-drying of human plasma or serum to be used for transfusion into patients, the only plant available was so large that ten to twenty *gallons* of plasma were needed for even preliminary experiments and it was clear that it would be very difficult to obtain a sterile product with such a plant A milk-drying apparatus was described by Waite[2] with which he reported the drying of some blood plasma (? animal), but his apparatus was not suitable for preparing sterile products We were therefore obliged to design an apparatus to meet the special difficulties of the problem and we have now produced a much improved apparatus based on this spray-drying principle that is capable of dealing under sterile conditions with such quantities of plasma or serum as are available ; these are relatively small compared with such a product as milk. To increase the scale of working, if desirable, would be simple

Plant for Spray-drying Plasma or Serum

The principle of our plant is that the plasma or serum is passed through a suitable atomiser into a stream of sterile warm air, the water being evaporated from the surfaces of the droplets The main advantages of this process are (*a*) the rapid evaporation obtained on account of the very large superficial area exposed at the surfaces of the droplets , and (*b*) the temperature of the material does not rise above the wet-bulb temperatures of the drying air until drying is almost complete, so that drying may be done quickly at temperatures much lower than those required in other processes carried out at normal pressure, and the danger of impairing the product by over-heating is avoided.

The apparatus, all of which can be sterilised before, and kept sterile during use, consists essentially of a large drying chamber into which the plasma or serum is blown in a very fine umbrella spray from an atomising jet in the top of the chamber, into a current of warm sterile air circulating within the chamber The dried plasma or serum collects at the bottom of the chamber, and also in a second smaller chamber or cyclone, the moisture being carried away in the outgoing air stream

The *drying chamber* (A in fig 1) is made of 18 gauge Firth's F D P 'Staybrite' steel welded and polished on the inside surfaces so that there are no cracks or niches , it is 6 ft high by 2 ft in diameter and carries a truncated head and conical base both made of similar staybrite steel The head is closed either by a heat-resisting glass or staybrite cover (B) All these detachable parts are made so that they can easily be dismantled for cleaning The cover has a hole drilled through the centre, through which the atomising jet (fig 2) is inserted and fixed before sterilisation. The stream of sterile air enters the chamber tangentially so that it takes a spiral course in the chamber round the periphery like a whirlwind, the air in the centre being relatively undisturbed.

Sterile dry air is blown into the drying chamber as follows (fig 1) A fan (C), capable of moving 250 c ft of air per min against a resistance equivalent to 19 in (water gauge), is used for drawing the air through a thick felt syrup-strainer, covered with two layers of cotton-wool and cotton cloth arranged alternately (D), and delivering it past a control valve, a standard 1 in. nozzle for measuring the air flow (E) and through the heater (F), into the chamber We have also used an oil filter as a precleanser of the air before its passage through the textile filter The oil filter is unnecessary from a bacteriological point of view, but on particularly foggy days it protects the cloth filter from excessive dirt in the atmosphere The heater (F) is a staybrite steel box containing ten 1000-watt 'Creda' electric fire bars each approximately 12 in. long, fitted in parallel in two sets of five on each diagonal plane of the heating chamber in the direction of motion of the drying air , they present a large clean heating surface over which the air must pass to be heated and sterilised before entering the drying chamber External resistances are coupled in series with the supply to these elements and it is possible to maintain the air stream at any temperature up to 250° C

Jet for atomising the plasma or serum (fig 2) —A simple internal type compressed-air atomiser (G in fig 1) has been designed to work in conjunction with any one of four stainless steel jets (0 25 to 1 mm diameter supplied by Messrs Accles and Pollock, Ltd , Birmingham) Fig 2 shows the design of the atomiser finally used. The atomiser is fixed into the detachable cover of either staybrite steel or heat-resisting glass, the latter having the great advantage of allowing visual observation of the behaviour of the spray, thus leading to better control It was observed that liquids could be sprayed easily through the atomiser by using compressed air at any pressure greater than approximately 18 in (water gauge) if the head of liquid was at least 2 in (water gauge) greater than that of the air being used in the atomiser This fact was utilised in designing the system adopted for feeding the liquid to be sprayed into the dryer (fig. 1)

Feeder apparatus —The stream of nitrogen or air used in conjunction with the atomising jet is applied from either a cure it, and since the type of case in which it was likely to occur can be recognised, preventive measures can be taken. Injections of liquid pituitary extract, 1 c cm. four hourly, should be begun immediately after operation and continued for 48 hours, but pituitary extract has no place in the treatment of established ileus Morphine must be given often enough to ensure that the patient is completely at rest and free from discomfort Continuous gastroduodenal suction should be used, he considers, to maintain decompression of the bowel, especially if the continuity of the bowel has been interrupted, in the treatment of established ileus suction is maintained until the aspirated material is no longer dark and foul-smelling and the patient's bowels move spontaneously, fluid and salt therapy are maintained throughout Conservative treatment of strangulation obstruction is never justified but may be useful in mechanical obstruction due to matting shortly after an abdominal operation Continuous suction and administration of fluid and salt may be followed by recovery, but even if it is not, operation can be carried out later when the bowel is at least partially decompressed and the patient's water and salt balance are normal If abdominal tenderness develops during conservative treatment, operation is called for, in strangulation obstruction operation must be early but preoperative preparation—stomach wash-outs and rapid infusion of blood and saline—must not be neglected If the bowel is viable, simple relief of the strangulation followed by continuous suction and the administration of adequate quantities of fluid are sufficient treatment, but if the bowel is gangrenous he advocates a two-stage operation, the affected loop is brought outside the peritoneal cavity is closed, the gangrenous portion of gut is removed and the contents from the upper loop are collected and fed into the lower loop Continuity of the bowel was restored at a second operation, preferably about a week later

---

[1] Aylward F X Mainwaring B R S and Wilkinson J F *Brit med J* 1940 ii 583

[2] Waite, R. *Chem and Ind* 1940 59, 659

Medical News

University of Cambridge

Dr W J O'Connor has been appointed university demonstrator in pharmacology

Royal Society of Medicine

A general meeting of the fellows of this society will be held on Tuesday, March 3, at 4 30 P M On March 4, at 2 30 P M, Mr L F Newman will read a paper to the section of the history of medicine on dietetics in the sixteenth and seventeenth centuries The section of surgery will meet at the same hour to discuss growth and new growth The opening speakers will be Mr L R Broster, Mr Harold Burrows, Dr W E. Gye, F R S, Mr P B Medawar, and Dr F G Spear At the section of otology, on March 6, at 10 30 A M, Mr W M Mollison will speak on deafness due to central lag, and Dr F W Kobrak on the functional activity of the tympanic muscles At 2 30 P M, on the same day, at the section of laryngology, Mr V E Negus, Mr T Pomfret Kilner and Major H M Graham will open a discussion on injuries of the nose and throat The section of anæsthetics meets at the same time, and Mr Ralph Lee, Mr H A E Talley and Dr C Langton Hewer are reading short papers

Ophthalmological Society of the United Kingdom

This society proposes to hold a two day congress in London, on Friday and Saturday, May 29 and 30 Titles of papers should be sent to the acting hon secretary, Mr Frank Law, 36, Devonshire Place, London, W 1, before the end of March

Tuberculosis in Scotland

The annual report of the Royal Victoria Hospital Tuberculosis Trust shows that during this war there has been a greater relative increase in the death rate from tuberculosis in Scotland than in the first complete year of the last war In 1914 the death rate was 162 per 100,000, in 1915 164, in 1939 it was 68, in 1940 80 When the death rate rises, the cause may be found partly in acceleration of death in old-standing cases, and partly in deaths of those who have recently acquired the disease Some of the deaths are probably of patients who in peace time might have survived for several years but who in war time—owing to overstrain and other factors—succumb more rapidly When war began large numbers of open cases were sent home to provide accommodat[illegible] expected casualties Infection was passed to children [illegible] new cases of childhood tuberculosis increased The committee of the trust consider that the new cases and the old ones whose condition has deteriorated owing to lack of hospital accommodation should be regarded as casualties of war Facilities for treating such patients are inadequate and the committee urges all responsible authorities to resist any slackening of curative effort War time rationing, increased calls of industry, lack of ventilation in blackout hours, and the increased number of cases under domiciliary treatment are all factors helping to spread the disease

Medical Honours

The M B E has been awarded to Dr Adaline Miller, for her services as ship's surgeon when the ss *Britannia* was sunk by enemy gunfire During the action Dr Miller attended to the wounded and dying She continued her good work after the company had taken to the lifeboats and by her efforts saved many lives

The R N.V R *officers' decoration* has been awarded to Surgeon Commander B W C Archer, M D St And, Surgeon Commander A S Bradlaw, M B Dubl, Surgeon Commander F A McLaughlin, F R C S, and Acting Surgeon Commander H M Willoughby, M R C S

Conference on Physical Education

On Friday and Saturday, March 6 and 7, at BMA House, Tavistock Square, London, W C 1, the Ling Association is holding an inter allied conference on physical education which will be open to teachers of physical education, doctors and others interested The speakers will include Miss Achsa Bean M D, assistant chair- man of the department of health and hygiene of Vassar College, Dr George Hoan Hsing Woo, Miss Phyllis Spafford secretary of the association, Lieutenant Kjeld Birkelund, *gymnastic instructor in the Norwegian Army* and Mr Ruscoe-Clarke, F R C S Further information may be had from the offices of the association, Hamilton House, Bidborough Street, London, W C 1

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export

Appointments

JONES, W D LOVELOCK M B WALES, D P H medical superintendent at Amersham Hospital
MILLER, ADALINE N, M B GLASG anæsthetist at the Leicester Royal Infirmary
NUSSBAUM, OLGA, M D VIENNA asst school M O for Wolverhampton

Births, Marriages and Deaths

BIRTHS

ADDISON—On Feb 12, the wife of Major G M Addison, R A M C, M R F—a daughter
HARGREAVES—On Feb 18, in Weymouth, the wife of Major E R Hargreaves R A M C—a daughter
MCKENZIE—On Feb 21, at Cheltenham, the wife of Squadron Leader William McKenzie, F R C S—a son
MCKEON—On Feb 19, at Lancaster, the wife of Dr J A McKeon—a daughter
RITCHIE—On Feb 18, at Hove, the wife of Dr Peter Ritchie—a daughter
WARRACK—On Feb 19, in Edinburgh, the wife of Major G M Warrack, R A M C—a son

MARRIAGES

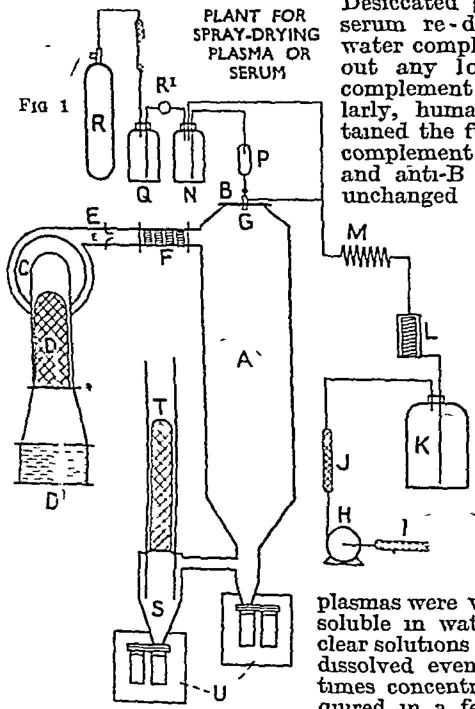
KENNEDY—NORRIS—On Feb 17, in London, Alastair Baird Kennedy, L M S S A, surgeon lieutenant, R N V R, to Gillian Barbara Norris
MACLAREN—MUNRO—On Feb 19, at Pinchbeck, Henry Colin Maclaren, M B, to Jean Ramsay Munro
WALLEY—CAMPBELL—On Feb 8, at Stirling, Jon Walley, B M, surgeon lieutenant, R N V R, to Josephine Helen Campbell, M R C S, captain, R A M C

DEATHS

BROWN—On Feb 21, in Glasgow, James Pearson Brown, D S O, T D, J P, M B GLASG, F R F P S of Campbeltown
CONDER—On Feb 15, at Cheltenham, Archibald Francis Reignier Conder, M C M D EDIN, aged 62 years
KENDALL—On Feb 16, at St Albans, George William Kendall M D DUBL, of Lordship Park, N 16, and Llynon, Anglesey
LEWIS SMITH—On Feb 18, Frank Lewis Smith, O B E, M R C S surgeon rear admiral R N
MAY—On Feb 20, Walter John May, M R C S, L D S, of Upper Wimpole Street, and Gerrard's Cross
NELSON—On Feb 18, at Camberley, Surrey, Kenneth Montague Nelson, M C, M R C S, lieut colonel, R A M C
O'CARROLL—On Feb 18, at Dundrum, co Dublin, Joseph Francis O'Carroll, M D R U I, F R C P I, formerly professor of medicine at University College Dublin
ROLL—On Feb 21 at Thames Ditton Grahame Winfield Roll, M B CAMB, F R C S, M R C P, aged 79 years

pepsin so that the resulting powder re-dissolved readily without diminution in digestive power. Thus, an aqueous solution containing 10 g. of scale pepsin and 90 g. of lactose per litre yielded a fine dry powder of which 1 g. (containing 0.1 g. of pepsin), when assayed by the standard U.S.P. egg-white digestion method, showed the same activity within experimental limits as 0.1 g. of the original scale pepsin when examined at the same time under the same conditions. Muscle extracts have also been spray-dried without loss in activity of the sensitive glycolytic enzyme system.

FIG. 1



A, drying chamber. B, glass or steel cover. C, fan. D, textile air filter. D¹, oil filter. E, nozzle for measuring air flow. F, heater. G, atomiser. H, motor blower. I, felt filter bag. J, glass wool filter. K, pressure-equalisation vessel. L, heater. M, cooler. N, supply bottle. P, drip tube. Q, Winchester containing sterile filtered liquid to be dried. R, gas cylinder. R¹, sintered glass filter. S, cyclone separator. T, textile filter. U, receivers in glass-fronted boxes.

The desiccation of human plasma-saline, plasma and serum, and of guineapig serum was carried out in the same manner without difficulty and without the necessity for any preliminary treatment such as precondensation. Desiccated guineapig serum re-dissolved in water completely without any loss of its complement titre. Similarly, human sera retained the full titres of complement and anti-A and anti-B agglutinins unchanged. Grouping sera of high titre were separately dried on this plant yielding undenatured fine powders which retained their anti-A and anti-B agglutinins unimpaired. All these sera and plasmas were very readily soluble in water yielding clear solutions and readily dissolved even to a five-times concentration if required in a few minutes. The sodium nitroprusside test for denaturation was completely negative.

Sterility.—The preparation of a sterile product depends on scrupulous care in sterilising the apparatus at the beginning and in collecting the dried product. Once the machine is running no contamination can occur inside until the run is stopped; this continuity of the process is of much importance. We have repeatedly tested all parts of the apparatus and at different stages of running for sterility and are satisfied that no source of contamination is present. The desiccated products were found to be sterile using the tests for sterility recommended by the Blood Transfusion Research Committee of the Medical Research Council. In addition, sample bottles of dried plasma or serum have been reconstituted by the addition of sterile water and incubated for 7–14 days at room temperature and at 37° C without evidence of the presence of organisms.

Physical properties.—Spray-dried serum, plasma and plasma-saline form fine, light, fawn-coloured powders, very readily soluble in cold water yielding perfectly clear solutions. These powders, when examined under the microscope, have a hollow shell appearance; indeed this appearance is a test for the correct operation of the spray during drying.

The moisture content of dried plasma has been stated to be an important factor in its keeping properties. A sample of spray-dried whole plasma exposed to the atmosphere of the laboratory came to equilibrium when it contained 10–11% of moisture. This then may be taken to be the moisture content of the air-dried powder. Of the spray-dried whole plasma or serum, samples collected below the drying chamber and cyclone had moisture contents varying between 3.7% and 10.64%, depending rather on the rate of spraying and the adjustment and the degree of fineness of the spray than on minor changes in temperature or the volume of drying air used. Thus, raising the temperature of the drying air from 77° to 100.5° C resulted in a drop in the moisture content of only 1.42%. In other experiments approximately doubling the rate of the air flow caused a drop in moisture content of the same order.

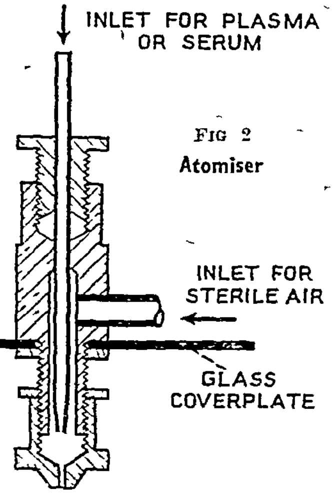


FIG. 2
Atomiser

"Chemically dry" preparations.—In view of the fact that a "chemically dry" powder is said to keep indefinitely, experiments have been carried out to ascertain the further possibilities of complete desiccation of the spray-dried powder. Dried whole plasma containing 10.45% moisture, after exposure in a thin layer over phosphorous pentoxide in vacuo for 48 hours contained only 0.01%. Spray-dried whole plasma in bottles approximately 3 in. in diameter and 5 in. in height, about three-quarters filled, when exposed in vacuo over phosphorous pentoxide showed a fall in the moisture content to 0.7% in five days, while in fourteen days it was practically nil. These figures illustrate that complete desiccation of spray-dried powders can be obtained by evacuation over P_2O_5. The dry powders obtained from plasma-saline, whole plasma and serum have been found to be easily and completely soluble in water without cloudiness of the reconstituted liquids.

Reconstitution.—Solution of powder in sterile water takes place in a few minutes if done correctly. It is convenient for ordinary use to put the requisite amount of desiccated serum or plasma into a dry sterile M.R.C. blood bottle with or without a few grammes of glass beads. The bottle is sealed and evacuated by means of a needle through the stopper, which is then withdrawn. This procedure removes any air from the microscopic shell-like structure of the powder and thus permits complete solution in water within 1–2 min. when sterile water is allowed to run into the bottle and shaken. Rapid solution can be obtained even when a five-times concentrated serum or plasma is required.

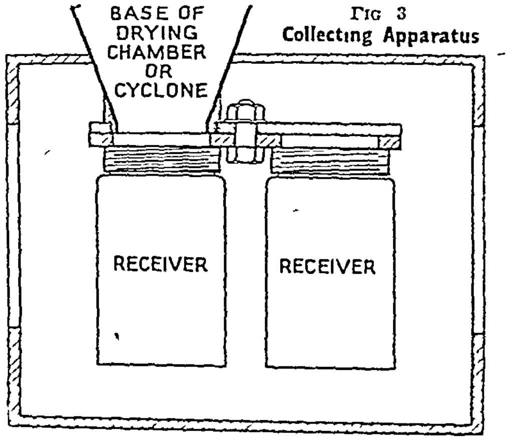


FIG. 3
Collecting Apparatus

Clinical tests have been carried out using reconstituted desiccated (spray-dried) plasma, plasma-saline and serum. It is intended to present fuller details later. We can note here that the reconstituted solutions in sterile water in normal concentration behaved exactly as did the original fluids when tested clinically. We have also employed reconstituted plasma and serum in concentrations up to five times with satisfactory results. These concentrated cylinder of compressed nitrogen or a motor blower (H) which draws the air through a felt filter bag (I) and passes it through a glass wool filter (J) into a large pressure equalisation vessel (K) This air stream passes slowly over the surface of a 750-watt heating element enclosed in an insulated steel container (L) where the temperature is raised to about 400° C The stream of sterilised air flows through the cooler (M) and is divided so that part goes to the supply bottle (N) to put the plasma or serum under pressure and displace the amount fed to the atomiser, the remainder of the sterilised compressed air is directed to the atomiser The liquid displaced from the bottle (N) by compressed air flows through a drip tube (P) to the atomiser and is sprayed into the drying chamber, the rate of flow being controlled by a valve

The sterile plasma or serum to be dried can be supplied to the feed bottle (N) by the following two different methods (1) Winchester bottles (Q) containing the sterile, filtered liquids are connected as required to the inlet tube of the feed bottle (N) and their contents blown into the feed bottle by air under suitable pressure from gas cylinder (R) (2) The plasma or serum is stored in a large tinned copper reservoir and then blown through a Seitz filter directly into the sterile reservoir (N), this can be done as convenient

Cyclone separator (fig 1)—Although some of the dried plasma or serum collects at the bottom of the drying chamber, owing to its fineness and lightness a large proportion is carried out by the air stream The air stream is, therefore, passed through a small cyclone separator (S) for further removal of the powder The cyclone separator is also made from 18 gauge staybrite steel and has proved to be very efficient, most of the dried powder being collected at the base of the cyclone rather than at the base of the drying cylinder There is no loss of dried powder in the air stream passing through the textile filter (T) attached to the exit pipe of the cyclone

COLLECTION OF DRIED PLASMA OR SERUM

Fig 3 shows the method of collecting the dried powders under sterile conditions at the bases of the drying chamber and the cyclone thus enabling the plant to be run continuously

To each base is fitted a closed wooden box having a glass front and a hole at each side closed with a dust-proof "glove," by means of which manipulations can be carried on inside without opening the box Inside the box also are two 40 watt lamps to warm the receiving bottles slightly above the dew point, so avoiding condensation of moisture in them In these two boxes special carefully machined attachments, designed on the principle of the microscope double objective nosepiece are fixed to the lower outlets in the bases of the drying chamber and cyclone respectively Each is composed of two rigid flat circular plates connected at the centres on the pivot,, the top plate has one eccentric hole for connexion to the appropriate base The bottom plate has two slightly larger diametrically opposed holes drilled on the same pitch circle as that in the upper plate Screw caps (to fit the receiving bottles) are fixed concentrically with each hole in the bottom plates and drilled with the same size of hole as that in this plate The flat surfaces of the two plates in contact are carefully machined to make an air tight joint A bottle can be screwed into each cap and by turning the bottom plate about its pivot each bottle may be connected in turn to the plant for collecting dried powder, while a full bottle may be removed and replaced by a fresh one under sterile conditions without interfering with the continuity of the drying process

ROUTINE EMPLOYED

The top plate of the drying chamber carrying the atomiser, both the swivel nosepieces, all rubber and glass tube connexions, and the drip tube are sterilised separately in parchment paper in the autoclave for half an hour at 10 lb per sq in, the ends of the rubber tubes and nozzles are temporarily plugged with wool into small test-tubes The collecting bottles, plugged with wool and covered with parchment are sterilised in the air oven for an hour at 150° C The screw caps for these are sterilised separately in the same way

The plant is started as follows The heaters are regulated so that air at 230° C is blown into the drying chamber The previously sterilised top of the drying chamber is put into position and the exits of the cyclone closed When air has been blown through the drying chamber for an hour with an exit air temperature of 150° C, the swivel nosepiece in the closed position is attached to the base of the chamber and the hot air blown into the cyclone and out at the lower exit in its base for a further hour at 150° C Finally, the previously sterilised textile bag and the second swivel nosepiece are attached to the cyclone and hot air (exit temperature 150° C) is blown through the whole machine for a further hour In this way the entire apparatus is completely sterilised inside The temperature of the ingoing air is then reduced to 70–80° C and the plant allowed to cool down and reach equilibrium for a further half hour, when the receiving bottles are attached to the nosepiece under the hoods and all tubes are fitted with preliminary flaming and all suitable precautions to preserve sterility The receiving bottles are turned under the drying chamber and cyclone respectively and the spray is started, the temperature of air entering the drying chamber being maintained at 70–80° C The plasma or serum is run in at such a rate that the drops can just be counted in the drip tube As they are filled the receiver bottles are changed by swivelling the nosepieces and taking the usual precautions under the box hoods during the removal of the full bottles and replacement by sterile empty ones

When the process is to be discontinued, the bottles are swivelled to the neutral positions, after stopping the spray and gently tapping the outside of the drying chamber and cyclone to shake down any powder sticking to the sides of the conical bases Then the heaters are switched off and allowed to cool before stopping the air flow The apparatus can then be opened, washed out with cold water and cleaned The usual precautions are taken to prevent undue contamination or disturbances of the air in the room where the apparatus is being used, the floor being treated with oil, and other precautions taken to reduce the risk of contamination, as used in the plasma-filtration room

In using an apparatus of this type for the spray-drying of solutions, there are obviously many variable factors to be considered, the nature of the resulting product depends on the proper adjustment of these The main factors concerned are—

(a) *The nature of solution* to be sprayed, its total solid content, and the characters of the solute Serum, plasma or plasma saline containing some 4–10% of total solids does not require precondensation as might be necessary with more dilute solutions

(b) *Jets and atomiser*—Shape, size, number, adjustment, position in chamber, pressure of air and liquid in the atomiser, the nature of the atomised spray as to fineness, dispersion, &c

(c) *Air current*—Temperature, speed, volume, initial dryness, its direction of movement in the drying chamber Also the type, size and resistance to air flow of the air filter

(d) *Heater*—Temperature of air entering drying chamber

(e) *Drying chamber*—Size, temperature, point of air entry and exit, the latter influencing the relative proportions of powder collecting in the receivers of the chamber and cyclone respectively

(f) *Cyclone*—Internal construction

(g) *Textile bag filter*

(h) *Maintenance of sterility*

The speed of drying depends also on these factors and the size of the plant; we can dry successfully in this size of apparatus at the rate of 1½–2 litres per hour, and the yield on a continuous run is practically quantitative We find that a little of the desiccated product may adhere lightly to the internal polished wall of the drying chamber, and a proportion falls to the bottom and collects in the conical base whence it drops into the receiving bottle The majority, however, of the fine powder is collected in the receiver under the cyclone If the textile bag is sufficiently fine there is no loss of powder at all from the apparatus The optimal working conditions described have been arrived at after many experiments, in which all these factors were varied

Results

In all our experiments we have borne in mind the absolute necessity for (1) producing an undenatured desiccated preparation which will re-dissolve in water to yield a solution identical with the original starting material, and (2) maintaining sterility of the starting material, the inside of the apparatus and the final product

Preservation of heat-labile characters—Using this apparatus we spray-dried fresh cow's milk without any demonstrable loss of its peroxidase reaction or solubility in water It was equally easy to desiccate solutions of no real bother I can't stop them, not much but you get the wind up when they're whizzing down, bombed out of three houses so it's not too good now—sirens rather upset me.

Of the abnormal responses there are several varieties. A lorry driver of 35 says "They don't affect me in any way." He admits he's shaky yet denies this is nervousness though his wife "is nervy and shaky, this is nervousness because she shakes after the bomb has fallen and I don't." Some of the denials seem equally irrational, and also are rather obviously determined by the impression that fear, anxiety or panic must be denied: "Not at all, I've a tin hat and all that", "certainly I'm not worried, not in any way—as a matter of fact I've volunteered." Similar reactions often occur in those with shelter-phobia—"Of course not, I stay out all the time"—but their real reason is that house or shelter at times of aerial bombardment produce acute claustrophobia.

If it is granted that the division into normal and group 1, 2 and 3 is valid it is worth mentioning that no connexion is to be found showing that the poor mixers or those with poor family histories belong to any one group. On the other hand if together with those showing a poor work record we include those unwilling to contemplate being foremen or accepting responsibility we have 18 cases, and 14 of these showed an unreasonable reaction to danger, though more than half denied that they did. Non-recognition or absence of fear may accompany constitutional or environmental inferiority, or the explanation may be that the inferior individual has to look with a blind eye at his danger. The old bedwetters and persistent nail-biters showed no specific reaction. The control group contained as many as 23 persons with compulsive traits, though none of these was serious. More than half of these people behaved (by their own account) in a well-adjusted way in situations of danger. The most surprising feature among the controls was the number who suffered from mild phobias, usually with symptoms in cinemas or tubes; these they avoided, and hence carried on quite happily. At first sight no serious cases of phobias were encountered, but when questioned about their reactions to air-raids, a different picture was revealed; 15 had shelter-phobia. This was not a distaste for shelter conditions but showed itself as a sense of constriction in the chest, often accompanied by sweating or palpitations. It occurred in big shelters as often as in Anderson shelters. Here are some typical examples:—

CASE 1.—Engineer, aged 24. "At first shelters turned my nerves up, since then I go in them and don't get scared." Doesn't like shelters even though his house has been hit. Every bomb seems to be coming for the shelter; "you feel safer if you go out and help."

CASE 2.—Stoker, aged 41. Never liked cinemas or music halls. "I don't go down no shelters" (emphatically), "I like fresh air" (despite his occupation).

CASE 3.—Labourer, aged 40. Never liked travelling or cinemas. "I get a bit scared at times, I stand out there all the time in the alley. I seem to have more confidence. I'd hate sheltering, I'm choked."

CASE 4.—Engineer, aged 32. Some years ago claustrophobia, never since. "Folks are amazed at my fatalism." And then the reason comes out: "I won't go into a shelter—it's claustrophobia."

CASE 5.—Liftman, aged 52. "I like to go out and see them"—because he has fears of shelters, though not of lifts.

Shelter-phobia is mild where there has been no previous phobia. My impression, from cases like 2, 3 and 5, is that some of the apparent bravery is phobia-determined; where there have been previous phobias of closed spaces complacency even in large shelters is uncommon.

CASE 6.—A shelter warden who has stood up well to strain considering his psychopathic heredity developed a recent anxiety about more and more safety exits in his large shelter. This may indicate that his own adjustment is weakening, and in his criticism of the owners on this question of exits one can see how personal anxiety, too heavily strained, may lead to a paranoid reaction about the alleged negligence of the authorities.

AIR-RAID REACTION CASES

Of the 49 men and 14 women in my series of 63 reactions to raids 28 had been involved in incidents but only 10 had been injured, and only 1 of these seriously. The homes of several had been wrecked (as had occurred with the controls). Several had had periods of overwork, but by no means always just prior to the onset of symptoms. Two men of the best mental calibre had certainly overworked and had reacted in the one case by a confusional state, in the other by a depression. A rough estimate suggests that before the onset of symptoms at least 90% would have been graded in category 1 by a medical board unacquainted with their personality history, whereas a personality history alone would have caused 48% to be graded low. When these patients were asked "How do the air-raids affect you?" only 3 gave an answer which suggested a reasonable acceptance of danger, 15 showed an excessive reaction, 18 grudgingly admitted anxiety, 27 persisted in denying it. For purposes of comparison a group of 52 established psychopaths known before September, 1940, and seen after that date are compared with the control cases and the air-raid reaction group in table I.

TABLE I—COMPARISON OF ALLEGED REACTIONS IN THREE CLASSES OF PATIENT

Type of response	Controls % (102 cases)		Air raid reactions % (63 cases)		Previous psychopaths % (52 cases)	
Normal	68		4		13	
Excessive reaction	11		24		23	
Fear grudgingly admitted	10	21	29	72	27	64
Fear denied	11		43		37	

There was thus no appreciable percentage difference between the grouping in those suffering from air-raid reactions and in established psychopaths, but there was an outstanding difference between these and the controls, of whom 68% accepted the effects of acute dangers in a reasonable way, whereas an almost equal number of the others gave answers suggesting a suppression of their feelings.

COMPARISON OF PSYCHOPATHIC TRAITS

The difference between the control group and the psychiatric cases may be made clearer by a comparison of psychopathic traits. Assessment of these on a point system was tried, but was not easy. No *qualitative* difference in, say, the bad work records or the family histories is possible, but the following list (table II) shows that on the whole the comparison tells against the cases of air-raid reaction and favours the controls.

TABLE II

—	Air raid reactions	Controls
Past war experience	6	3
Gives up work easily	6	3
Constant changes in occupation	13	4
Specially bad work record	1	1
Recurrent vague ailments	9	5
Antisocial behaviour at times	5	1
Admits being highly strung	24	31
Poor family history (psychopathy, separated families, &c.)	21	18
Poor social mixers	35	19
Highbrow, exclusive, hobbies	7	0
Total "bad" marks	127	85
Total cases	63	102
Psychopathic traits per person	2	0.8

This represents a ratio of 5:2 in the incidence of psychopathic pointers in the patients with air-raid reactions, quite apart from the quality of their deviations.

SOCIAL HISTORY AND PROBLEMS OF THE AIR-RAID GROUP

Returning to the psychiatric cases, rather more than a third of all the cases, and rather less than half the men (23 cases) were civilian defence workers. These were exposed to greater dangers than the others in this series but their personality histories were particularly poor, and it is doubtful if they were at all appropriate for the work, or if their training increased their ability to stand up to solutions have offered no difficulty in preparation as indicated earlier Grouping sera can be dried equally well by this method and retain their anti-A and anti-B agglutinins, giving a most useful method of storing such sera for long periods without deterioration

Summary

A new apparatus is described for the continuous spray-drying of plasma, serum or plasma-saline under sterile conditions The apparatus is economical, inexpensive to build and can be worked continuously

Using this apparatus, human plasma, plasma-saline and serum have been dried on a semi-technical scale without loss, impairment or denaturation so far as can be detected

The products are sterile, fine, dry powders containing 3–10% moisture and are readily soluble in water yielding clear solutions

These products can be completely desiccated to "chemically dried" powders over phosphorus pentoxide in vacuo

Human and guineapig sera when spray-dried retained their complement titres unchanged

Human sera similarly did not show a lowering of their anti-A and anti-B agglutinin titres

They can be reconstituted into clear solutions, indistinguishable from the original plasma, plasma-saline or serum

Clinical results using these reconstituted liquids appear to be identical with those obtained with the original undried plasma, plasma-saline or serum

The desiccated plasma or serum will dissolve readily to as much as a five-times concentrated solution, which has also given good clinical results

Human sera of high titres for blood-grouping were also dried successfully without loss of titre

We wish to thank the University of Manchester for a generous grant and facilities for the erection of our second plant, Prof James Kenner, F R S, of the College of Technology, for facilities to erect the first plant, Dr Fred Stratton and Mr J Cannell of the Regional Transfusion Laboratories, Dr J C Brindret of the Public Health Laboratories, who has made independent bacteriological examinations of our plant and technique, and other members of our staffs and students who have spent long hours in maintaining continuous running of the plants

Mr F A Whittle and William Birch (Engineers) Ltd, Milton Street, Lower Broughton, Salford, were responsible for the manufacture of the two plants from our designs

---

MENTAL REACTIONS TO AIR-RAIDS

HENRY WILSON, M D CAMB, M R C.P, D P M
PSYCHOTHERAPIST, NEUROLOGICAL DEPARTMENT, LONDON HOSPITAL

THE small number of psychiatric casualties that have followed aerial bombardment has been a matter of surprise Why are these cases so much fewer than was expected? This paper presents some particulars which may help in part to answer this question, but one observer alone, or even several observers in any one district, can have no more than a small view of the problem A complete summary would include the study of psychiatric casualties in the forces (see Curran and Mallinson 1940, 1941), psychiatric casualties at first-aid posts and casualty hospitals, reactions in shelters, reactions in evacuation areas, where some of the stresses between billeter and billettee are probably due to anxiety about those left behind, or shame that the billettee has not been able to face the music, psychosomatic reactions

Considerable fear reactions have been witnessed in some shelters but have always been controlled by wardens, doctors and first-aid workers whose presence has certainly been important Reactions in evacuation areas have not been much recorded, though stupor has been described in people from heavily bombed areas (Harrisson 1941) Psychosomatic reactions are well recognised, but, as recorded below, it is surprising that they are not seen in persons who have come to first-aid posts in acute emotional states

Of 697 civilian patients brought to the first-aid post to which I am attached, 134 were suffering from the results of fright and anxiety and were dealt with by methods similar to those described by Mira (1939), Sargant and Slater (1940), Brown (1941) In the rush of work no adequate notes or follow-up of these cases, which ranged from acute emotional disturbance to hysterical paraplegia and stupor, were possible but all left hospital within twenty-four hours and only 6 returned Their names and addresses were known and further attendances in any department of the hospital could be traced This has been done, and it is remarkable that only another 4 attended any department of the hospital at times up to nine months succeeding the acute fear reaction, and none of these for what could possibly be regarded as hysterical conversion symptoms Thus most of the cases have apparently returned to normal, though some may have been evacuated They were all told that their reaction was due to fear, that that fear was one they shared with all other patients and with the first-aid workers, and that it was important that they should return to their normal work and resist the temptation to exaggerate the experiences through which they had passed

In order to answer our question a comparison has been made between 63 patients suffering from psychiatric symptoms due to aid-raid stress, seen in the neurological department of an EMS hospital, and 102 patients (86 men and 16 women), taken at random as controls from the surgical outpatient department of the hospital, where no question of hysterical conversion symptom was present (No service cases are included)

CONTROL CASES

Of the 102 control cases, 2 had had frank psychopathic illnesses within the last four years, and one a psychotic episode since September, 1940, from which there had been apparently complete recovery They were typical east enders ranging from 18 to 69 in age (only 4 were over 60), some were clerks, but most of them were labourers artisans, shop assistants and housewives, only 5 were in civilian defence The method of investigation was as follows

Information relating to previous history, injuries, work record, "attacks," use of leisure, and social adaptability were obtained, and the family history was reviewed The province of the sexual life was deliberately avoided, because it is always difficult to assess, may colour future replies and could not be entered into fruitfully in any rapid and practical review of military recruits or civilian conscription Finally, after inquiry about previous war service comes the question "How do the air raids affect you?" This was the last question addressed to them They had previously been told they were one of a group of normal persons who were being compared with a group of abnormal patients, and they were all coöperative and forthcoming with the exception of one cantankerous and suspicious man

Among the 102 controls 70 showed a normal response though 22 of these admitted occasional nervous upsets in years before the war, 11 were more disturbed than was regarded as normal (group 1), 10 only grudgingly admitted it (group 2), and 11 denied any disturbance (group 3)

It is difficult to define "normal response," since people vary in their sensitivity Perhaps the most striking example of normality was this answer "Anyone saying he's not nervous is a liar Kid other people, never kid yourself" It would appear that those over 60 share with normal adolescents the distinction of being least moved, the former perhaps because of developed stoicism The latter's indifference may be related to their "non-attachment", certainly there is a difference between the unattached adolescent and the recently married adult

Loosely described, normal response admits some fear accompanied by somatic reactions such as trembling, sweating, mild palpitations and looseness of the sphincters Where any of these become excessive the response was classed as abnormal (group 1) Two other groups are classed as abnormal group 2, where fear is not admitted at once, but only expressed reluctantly, group 3, where fear is denied and specious arguments are produced in support of this denial

Of those classed as normal responses the following are examples I tremble a bit, anticipation not too good, I get a bit excited and pass a lot of water, bit jumpy to begin with, I'm not brave but I don't like to frighten others, I do get worried but not excessively, system On this, obsessive-compulsive traits are rated as high handicaps In this series the stable controls might have scored worse than those developing symptoms, since compulsive traits were commoner The difference is possibly to be explained by the occurrence, in the factory, of constant tensions—in these cases, of one particular tension. As has been pointed out by others the obsessional character is afraid of unknown fears; air-raids have become known dangers

An examination of recruits for civilian defence, and possibly a wider examination of persons in danger areas, should stress other factors Of these I suggest that a history of the previous work-record (including an assessment of normal ambition and the recognition of abnormal unwillingness to accept responsibility), and the question "What makes you want to take up these new duties?" are important Are methods of improving group-allegiances and teamwork fostered in the civilian defence services? Are team contests arranged between various stations? Is any effort made to arrange that station shall compete against station, shelter against shelter, on the lines of inter-regimental and intercompany contests in the Army, or the rivalry between divisions in the regular police

It is natural that civilian defence workers should hesitate to admit their anxieties, but it is unnatural that they should deny them. Many of those who broke down did so, in part, because they were afraid of their fear Sometimes this was fear of social ostracism, but, as one expressed it. "If I was to be afraid, I don't know what would happen I might bust" When any service must recruit some persons of this type it is clear that reasonable expression of timidity and anxiety should be allowed if it is associated with those opportunities of corporate responsibility and wholesome co[illegible]ion which are so conducive to strengthening morale

Lastly, in the laudable intention to prevent contagious hysteria the civilian defence services appear to accept certificates of debility provided not more than three weeks' absence at a time is granted Some of these certificates are repeated after short intervals of inefficient labour For some defence workers three weeks is too long, much shorter periods before return to situations of stress are desirable in many cases, perhaps in all Immediate recognition of the man's incapacity to face arduous work is desirable and for these rapid transfer to other work of national importance, more suited to their handicaps, may be desirable This calls for closer coöperation between examining medical officers and the appropriate ministries

SUMMARY

Of 134 cases of acute emotional reaction to air-raids admitted to a first-aid post in an area housing a highly emotional population only 6 returned for subsequent treatment Even if half were evacuated the stability of the others is remarkable

Full psychiatric examination of another 63 psychiatric patients attending hospital for subacute symptoms due to air raid stress was compared with that of 102 controls from the surgical outpatient department

Psychopathic traits were 2½ times as common in the psychiatric patients as in the controls, and the controls were far more conscious of the fear excited by aerial bombardment than the psychiatric patients Shelter-phobia was present in 15 of the 102 controls

The admission and acceptance of fear is a safeguard against breakdown in conditions of acute stress This has a bearing on the selection of candidates for the civilian defence services, and a short psychiatric examination might eliminate a large proportion of unsuitable volunteers In the defence services themselves methods of enhancing group unity, and an admission of the strains and fears around would be likely to increase individual and corporate stability

REFERENCES

Brown F (1941) *Lancet* i 686
Culpin M and Smith M (1930) *Rep industr Hlth Res Bd, Lond* No 61
Curran D and Mallinson W (1940) *Lancet* ii, 738
— — (1941) *Brit med J* i 30
Harrisson T (1941) *Ibid* i 573
Mira E (1939) *Ibid* i 1217
Sargant W and Slater, E (1940) *Lancet* ii, 1

THE NEUROGENIC BLADDER

COMBINED TIDAL IRRIGATOR AND CYSTOMETER

Oscar W Stewart, M.D
MAJOR R C A M C
(*No 1 Canadian Neurological Hospital*)

Donald Munro, in 1936, reiterated the long-recognised fact that urinary sepsis is the chief cause of death in any type of cord injury after the first week[1] He reviewed the various types of abnormal behaviour found in the bladder, and their relation to the anatomical site of the spinal injury and to the variations in a given injury over a period He also called attention to the influence which extraneous factors, such as infection—general and within the bladder itself—have on the behaviour of the bladder after cord injuries To prevent cystitis and its complications, he described an apparatus for automatic periodic filling and emptying of the bladder[2] Later reports have emphasised the value of this method of care of the bladder paralysed as a result of spinal injuries

CLASSIFICATION

Physiological studies of the normal bladder and of the bladder showing disturbed function after spinal-cord lesions, have made it possible to correlate the different types of behaviour with the site of the lesion The several workers who have contributed to this understanding (notably Holmes Munro, Denny-Brown, Robertson, Langworthy, McLellan, Learmonth and Watkins) in the main divide the types of disordered function into three, depending on the site of the lesion—that is, on the part of the nervous control that is interrupted The three types are the spinal reflex bladder, the autonomous bladder and the atonic bladder Even this classification is rough, for the related parts played by the visceral and autonomic nervous systems are not yet wholly understood, and the reasons for changes which follow, for example, injuries to the sacral spinal segments or the cauda equina are not clear The classification applies to the ultimate and permanent state of the bladder after destructive lesions It is important to remember this because immediately after any severe cord injury, regardless of site, paralysis of the bladder exists which is the same in every case and characterised by retention, atony of the bladder musculature, distention and finally overflow This state has been spoken of as coexisting with "spinal shock," which signifies the temporary abolition, from a number of causes, of all spinal reflexes below the lesion It is not until the dominant components of an imbalanced neurogenic control produce measurable physiological and clinical signs that we are able to recognise the characteristic type of abnormal behaviour in each case Needless to say there are intermediate stages from the state of spinal shock to any one of the ultimate types of neurogenic bladder

The spinal reflex bladder ultimately results from a severe or complete lesion of the cord above the sacral segments Automatic emptying is entirely brought about through the spinal reflex arc The length of time required for the establishment of reflex bladder activity varies from weeks to months but is greatly delayed by infection and improper care during the early stages This is the desired end-result in such injuries, and the spinal reflex bladder is the most common type of neurogenic bladder to be dealt with

Autonomous bladder —This term is most commonly applied to the type of bladder which results from destruction of the sacral segments, conus medullaris, cauda equina, sacral plexus or the hypogastric plexuses Both the afferent and the efferent fibres of the reflex arc are interrupted, and therefore no reflex activity capable of emptying the bladder is possible Most workers describe increased tone and a high intravesical pressure in such a bladder, in contrast to the atonic bladder, where the sensory components alone are destroyed Eventually, emptying of the autonomous bladder may be regularly accomplished by manual compression of the abdominal wall and straining Intelligence, coöperation and ingenuity on the part of the patient and the physician can danger well, 8 had poor work records, were unable to remain in jobs long, or were carrying on unproductive one-man businesses, often in debt and difficulties

---

[1] *New Engl J Med* 1936 215 766

[2] Munro and Hahn J *Ibid* 1935 212 229

CASE 7—A carpenter aged 30, who had had constant changes of job, His father was a compensation case of many years' standing, always in debt His mother had chronic neurosis, his only brother was an obvious evader, his only sister had died in circumstances suggesting mental illness three years before

One regular fireman is included among the 63 but he had had a depressive illness a year before Not a single regular policeman is included, and Dr R D Summers, divisional police surgeon for the district, tells me that he has only encountered one case in a regular policeman among the 900 under his care The temptation to escape from irregular work or unsuccessful hawking into the regular war-time employment of civilian defence must be strong, particularly when it was considered less dangerous than military service Several accounted for their volunteering for civilian defence by describing the enthusiasm of their wives for the project One (perhaps a little off his guard) said "I didn't know my trade was reserved over 30, that made me go into the A F S" Only one had been a labourer, which seems as uncommon an occupation among those who break down as that of the regular fireman or regular policeman

Since only those air-raid reaction cases have been included about whom sufficient notes were available the series as a whole were of a more chronic type than the acute emotional reactions seen in the first-aid post The cases of the 23 civilian defence workers were complicated by indecision about their responsibility They had not seen clearly where their duty lay, or were still playing with ideas—dimly conscious—of situations where danger might be less A few belonged to the type (perhaps rather more common just east of Aldgate Pump), who find in any situation a chance for compulsory escape, and one gathered that a certificate urging immediate evacuation would have been welcome to some of these To a few, compensation for minor injuries had already been paid and their recovery seemed as hopeless as that of the peace-time unsettled compensation case One young woman with abrasions of the hand had succeeded in obtaining compensation pay within ten days—surely a record for any Ministry of Pensions She developed hysterical cephalgia and pain in the arm when the condition of the hand returned to normal. A more serious problem was presented by the following patient

CASE 8—A storekeeper, aged 28 He was a nail-biter, asthenic but otherwise normal With his present firm 6 years, 5 years ago had an accident No lump sum settlement but had received 49*s*, plus 6*s* 3*d* compensation weekly and light work ever since "They've tried to put hard work on me but —— " (a famous surgeon) "said I was never fit for it The manager tries to put it across me" The patient was in an Anderson shelter in October, 1940, when a bomb fell fairly near He was not injured but went at once to rejoin his evacuated wife On the evening of his projected return he developed severe pain in the right orbital ridge The insurance company wrote to him "It is observed that you are incapacitated from work by reason of nervous debility (bomb shock)", and then followed all the most potent suggestions for a continuance of symptoms

A man with this history and with this letter is unlikely to abandon his symptoms despite his total ignorance of their origin

Equally vague histories of blast are often met with, and "blast shock" threatens to become an ætiological menace In this series, 7 cases complained of it without any evidence of injury Careful history will reveal that the alleged symptoms of the blast did not arise at once, in 3 at any rate they did not appear until the patient had taken a conveyance depositing him many miles from the incident But where some injury did occur the train of events seems different

CASE 9—A quarryman, aged 42, who had always been reserved, and for years claustrophobic When his father was dying of vesical retention he developed disabling penile pain No sufficient explanation for this could be found physically or psychologically Theories of identification with the father might have been indulged in but hardly with therapeutic relief When he was fully conscious, more than two days after unproductive 'Evipan' investigation, he remembered vividly being hurled by blast from a bomb against a shelter in which he could not take refuge (because of his phobia) and he had penile pain associated with constant urge to micturate after this As far as could be judged he was not concussed, but he had had complete amnesia With the recovery from the amnesia his symptoms of pain disappeared though many longstanding psychopathic symptoms persisted

CASE 10—A corporation lorry driver, aged 41, was on a roof when bombs began to fall He rushed downstairs and was thrown head forwards against the wall by the resulting blast He did not lose consciousness but immediately developed persistent pain over his mastoids where operation had been performed thirty years before Under evipan he revived some of his anxieties, of which the greatest was constituted by the conflict over his longing to seek shelter and his stubborn refusal to do so, not apparently because he had any phobia or latent phobia of closed spaces but because he identified shelter-philia with the characteristics of a race he saw fit to despise

Among the air-raid reaction cases nail-biting was common, but shelter-phobia and compulsive traits less common than in the normal group Bad work-records occurred along with unsuccessful marriages or poor reactions to marriage difficulties Case 7, for instance, had (in addition to his heavily weighted family history) the cares of a fantastic affaire-de-cœur which only a socially inefficient person could have become involved in Repressed anxiety in 4 cases ran parallel with increased irritability and grave suspicions which might be the forerunners of serious paranoid reactions, 7 showed very slight patchy amnesias which only close questioning revealed, with an inaccuracy about dates and events so small as to be easily overlooked In 2 cases evipan investigation did not overcome this, though the patient in other ways was considerably improved

ABSENCE OF FEAR

Taking the two groups it appears that total denial of fear is a poor prognostic sign. Contact with the cases shows that there are two types in which fear seems reduced and undeveloped The first is the stable, well trained individual—e g, the regular policeman The second is the adolescent whose desire to be up and about is very different from the man with shelter-phobia who cannot be confined It would seem on the basis of a very few cases that the adolescent's apparent indifference is altered to normal anxiety when his work becomes more responsible, or he begins thinking of serious marriage.

DISCUSSION

In reviewing both groups one is impressed by two main features the much commoner denial of anxiety feelings in the air-raid reaction cases as compared with the controls, and the preponderance of psychopathic traits in the reaction cases Some of the controls *may* break down under further strain, but so far only one has done so

It must be borne in mind that these 165 cases are only a partial cross-section The evidence suggests that a large number of those who suffer from acute anxiety quickly become stabilised The fact that there is obvious evidence of their anxiety necessitating attention at the first-aid post may itself be of assistance, particularly when steps are taken to reassure them that their reaction is natural But conversion symptoms—especially the dyspepsias, complaints of inframammary pain and headaches seen in the outpatient department—must be occurring and it is probably important to convince such patients at the first session of the obvious connexion between the onset of the symptom and the acute dangers or terror Having done so, reassurance about the normal nature of the reaction is as important as it is for the cases of acute emotional excitement seen at the first-aid post

Of delayed neuroses we can only surmise, while collecting evidence from evacuation areas But the question presents itself recurrently how can some of these air-raid reactions be lessened? For, despite the optimistic tone of some writings, my own experience is that even with enthusiasm and evipan narcosis chronic conditions are developing

Culpin and May Smith (1930), investigating factory workers, have rated psychological stability by a point

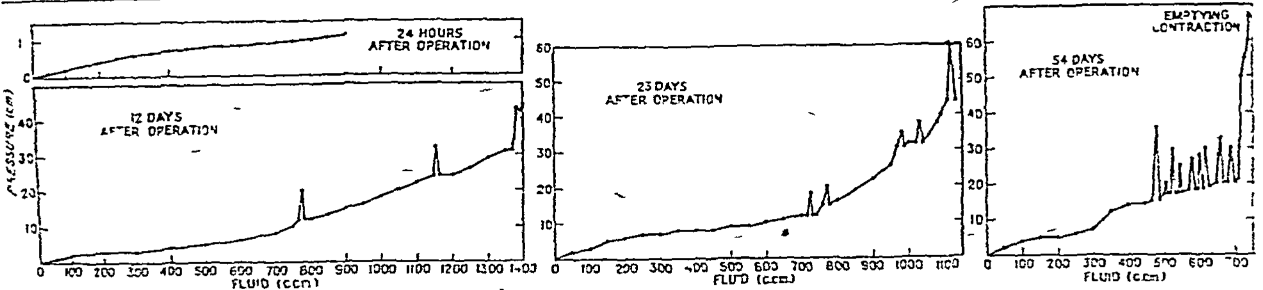


FIG 2.—Four consecutive cystometrogram records on a patient with a severe dorsal-cord lesion. Gradual return of detrusor tone and reflex contractions are shown. This patient was treated throughout by tidal irrigation and was evacuated to Canada with the set attached to a board and suspended by the side of his bed.

The use of the combined tidal irrigator and cystometer ensures accurate irrigation and drainage with known quantities of irrigating fluid and under known intravesical pressures, and makes it possible to follow the changing tone of the bladder musculature as often as is desired without a change-over in apparatus.

OPERATIONAL DETAILS

The fluid from the drip enters the horizontal arm of the glass Dakin's tube (J) and passes into the bladder through the rubber tubing connected to the indwelling catheter. It also ascends into the air vent (G) and into the siphon tubing (K) as the intravesical pressure rises. When the pressure within the bladder rises sufficiently to force the column of fluid over the siphon-tube loop, drainage of the bladder begins by siphonage. The column of fluid in the air vent roughly parallels that in the siphon-tube loop. When siphonage begins, fluid is drawn out of the air-vent tube at once and air is sucked in through the pin-point opening (D), but too slowly to break the siphon until the bladder is empty. When the bladder is completely empty the cycle begins again. It is always possible to tell at a glance if the apparatus is working properly, for respiratory excursions can be seen in the column of fluid in the air-vent tube. With any block between the system and the bladder these disappear. The indwelling catheter should be changed every 3 or 4 days. The patient should have the workings of this apparatus explained to him and be charged with noting the respiratory excursions and the rate of drip of the irrigating fluid.

For tidal irrigation the sterilised apparatus is assembled on a board to which it is attached by ties passed through holes in the board. The flask containing the irrigating fluid is suspended at least 75 cm. above the level of the Dakin's tube. The board is then suspended so that the Dakin's tube is level with the patient's symphysis pubis. The desired height of the siphon-tube loop is secured by suspending it with cord passed through holes in the board. Before the apparatus is connected to the indwelling catheter, fluid should be run through it to eliminate air. The apparatus is connected to the catheter by a glass connecting tube which should have a lumen at least ¼ in. in diameter. The clamp (B) is regulated to allow the irrigating fluid to drip at the desired rate. The number of drops a minute depends on how many times a day the bladder is to be irrigated and by what quantity of fluid. For example, if it is desired that the bladder be emptied when 300 c.cm. have been run in, and this is to be done ten times a day, the rate of delivery is 125 c.cm. per hour or a little over 2 c.cm. per min., and the drops per min. would be about 50. In practice, this calculation must take into account the secretion of urine into the bladder, which goes on continually. If infection is present when tidal irrigation is begun the number of daily irrigations should be increased and therefore the rate of drip speeded up. This is true also if at any time during the course of convalescence symptoms of infection develop. Frequent irrigations will quickly clear the urine and the symptoms of toxicity. If symptoms of infection do occur during the period of tidal irrigation they usually mean that the apparatus is not working properly, and the cause should be looked for and corrected.

The height of the siphon loop is that which the intravesical pressure must reach to initiate siphonage. If the bladder is to be emptied when 300 c.cm. of fluid have been run in the pressure within the bladder produced by this amount of fluid must be known so that the siphon loop can be set at this level. A cystometrogram is always done before tidal irrigation is begun, to give data both as to the level at which the siphon loop is to be set and the tone of the bladder musculature. Regular cystometrograms taken at short intervals are essential in regulating the rate of drip and the siphon tube height, for as the bladder tone improves readjustments in both must be made.

For cystometry it is only necessary to close off the siphon tube by means of the clamp (M), and loosen the clamp (H) to admit fluid into the manometer tube for intravesical pressure readings. With the glass Dakin's tube at the level of the symphysis pubis, the height of the column of fluid in the manometer measures the intravesical pressure. The bladder should be empty before starting the cystometrogram and fluid should drip into the bladder at about 120 drops per min. Readings are usually taken at 50 c.cm. intervals. Bladder contractions are plotted whenever they occur. The cystometer incorporated in this combined apparatus is the same, in principle, as the one used by Munro. It may be possible to simplify this combination even further, but the one described here has proved useful in the management of war casualties.

For more detailed study of the bladder reactions and behaviour, a glass T-tube may be interposed at the junction of the manometer tube (E) and the arm of the Dakin's tube. The T-tube is connected to a tambour and writing pen which records continuously, on a moving drum, all changes in intravesical pressure.

Irrigating fluid.—Sterile normal saline or one of the mild antiseptic solutions may be used as an irrigating solution. At Colonel Leonard Colebrook's suggestion we have used on the last 6 cases a 0.5% solution of sulphanilamide in normal saline. Higher concentrations tend to crystalise out with the variations in room temperature. Our experience so far suggests that this solution is of considerable value. The sulphanilamide is not absorbed by the bladder mucosa in amounts detectable in the blood. With greater knowledge of the specificity of the of the sulphonamides for various infecting organisms, it may prove valuable to add solutions of other compounds in the series to the sulphanilamide solution.

SUMMARY

Continuous tidal irrigation and drainage in the care of the cord bladder is again advised as the best means of avoiding infection and other complications which continually threaten convalescence in cases of injury to the spinal cord.

Repeated cystometric studies are needed for the judicious use of tidal irrigation.

An apparatus is described combining a simple, practical tidal irrigator with a cystometer. Although alternating irrigation and drainage is entirely automatic, this apparatus must be used with understanding and intelligent supervision.

Lieut.-Colonel W. V. Cone, chief of the neurosurgical service, has helped and advised in all phases of this work. I wish also to thank Lieut.-Colonel E. W. J. Akins of the Royal Canadian Engineer Corps, who helped with charts and diagrams, and Sergeant A. D. Melville, R.C.E., for his drawings.

ORGANON LABORATORIES (London) are issuing 'Davitamon-five' tablets for the day-to-day prophylaxis and treatment of mild hypovitaminoses. Each tablet contains 1000 i.u. vitamin A, 50 i.u. vitamin B_1, 200 i.u. vitamin C, 200 i.u. vitamin D, and 0.5 mg. PP factor of the B complex.

reduce to some extent the inconveniences and hazards of this type of bladder During the initial stage, the use of tidal irrigation gives the greatest protection

Atonic bladder results when the sensory fibres alone are destroyed This state is seen in tabes dorsalis, but rarely encountered in traumatic lesions Because of the complete loss of sensation the bladder becomes greatly distended unless the patient is trained to empty the bladder regularly by compressing the abdominal wall During the acute phase, however, tidal irrigation and drainage are again the most satisfactory methods of treatment

A fourth type is usually mentioned—the *uninhibited neurogenic bladder* Judging by its name this group should include all bladders devoid of cerebral inhibition, regardless of the site of interruption, but it is customary to apply the description only to those cases where cerebral inhibition is lost or interfered with by reason of injury to or disease of the cerebral hemispheres It is often seen in cases of frontal-lobe damage, either by tumour or by trauma, with loss of frontal-lobe substance or disturbed frontal-lobe function Precipitate micturition occurs and bladder sensation is greatly diminished Where cerebral inhibition is complete, the cystometrogram record is similar to that found with the spinal reflex bladder

TIDAL IRRIGATION AND THE CYSTOMETROGRAM

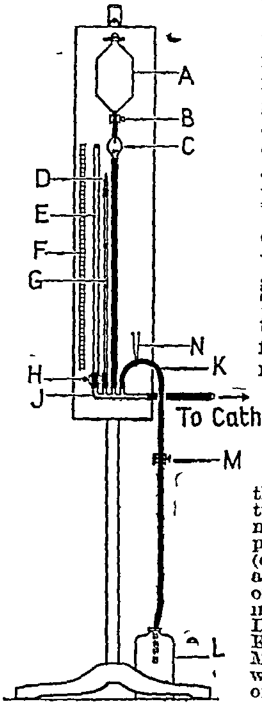
The chief task of the clinician confronted with a bladder paralysed from any cause whatever is to combat infection. Repeated catheterisations invariably lead to infection, and once infection is present retention and distention contribute to the subsequent complications which seriously affect the final result

Munro was the first to emphasise the value of tidal irrigation in such cases, and he described an apparatus which he used with success All who have treated "cord bladders" in this way find that the method, besides controlling infection, greatly reduces the difficulties of nursing and medical care The need for regular catheterisation is eliminated and the hazards of bed-wetting avoided Besides taxing nursing care, bed-wetting is a paramount factor in the development of bedsores, which add greatly to the difficulties of treatment

Bellis[3] has described an apparatus for tidal irrigation which embraces the same general principles as that of Munro but is far simpler and just as effective (fig 1) Automatic tidal irrigation, working on these principles, must take into account the tone of the bladder, so that the apparatus can be regulated to irrigate at desired intervals and with specified amounts of irrigating fluid As the bladder tone changes adjustments must be made in the apparatus to ensure uniform and controlled tidal irrigation and drainage The intravesical pressure can be measured by means of a cystometrogram as increasing amounts of fluid are run into the bladder The simple cystometer described by Munro[4] is accurate enough for all clinical purposes Fluid is run into the empty bladder through an indwelling catheter attached to the cystometer, which consists of an air vent and a glass tube manometer in series The intravesical pressure is registered by the height of the column of fluid in the manometer tube and measured in cm of water above the level of the symphysis pubis By plotting the pressures at 50 c cm intervals, a curve can be drawn indicating the tone of the bladder musculature (detrusor muscle) Reflex contractions are likewise observed and recorded as a sudden rise in the pressure column due to the raised intravesical pressure In addition to serving as a guide for tidal irrigation, the cystometrogram graphically pictures the changing state of the bladder from the initial stage of spinal shock to recovery in the less severe cases, or to the establishment of a spinal reflex bladder in the case of a complete cord lesion above the sacral segments (fig 2) When the reflex contractions are observed to be sufficiently strong, tidal irrigation may be discontinued to allow the bladder to empty itself automatically This step should be supervised carefully After each reflex bladder emptying, the patient should be catheterised to determine the amount of residual urine If the amount of residual urine is considerable and the patient develops symptoms, it may be necessary to continue the tidal irrigation until the detrusor tone is such that emptying is accomplished with little or no residual urine The need for numerous cystometrograms during the period in which tidal irrigation is being used has led me to modify the apparatus described by Bellis so that a cystometer is added without harming the simplicity of the irrigator The apparatus has, in fact, been simplified further by attaching a small glass tip with a pin-point opening (D in fig 3) to the top of the air vent instead of incorporating this "valve" in the glass Dakin's tube itself This change makes it possible to use the ordinary glass Dakin's tube which is generally available In the Bellis apparatus this air-vent tube and valve are comparable to the reservoir bottle in the Munro apparatus, and in principle should not empty until the bladder is completely emptied Actually, it is only necessary for the pin-point opening to be small enough to ensure that the amount of air entering the system during the siphonage of the bladder is not sufficient to break the siphon action, this, together with the efficiency of the apparatus, can be tested before use by attaching a rubber balloon to the rubber tube which would normally lead to the indwelling catheter

FIG 3

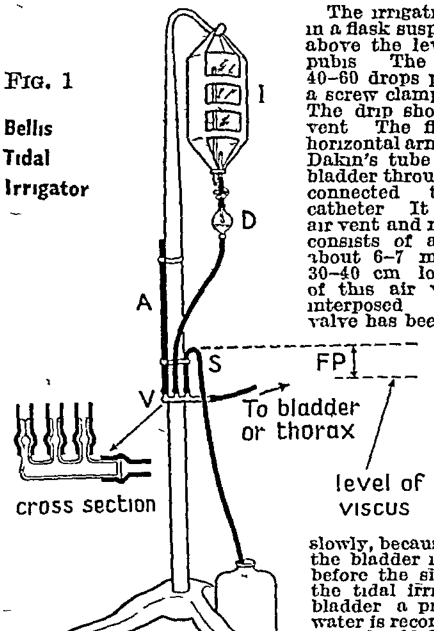
Tidal Irrigator and Cystometer Combined



A, reservoir, B, metal screw shut off clamp, C, Murphy drip bulb (air vent in side closed), D, glass tube with end drawn out to pin point opening, connected to the top of the air vent tube by a short rubber tube, E, ¼ in glass tubing to serve as manometer for measuring intravesical pressure, F, scale, G, air vent tube (capillary tubing with inside diameter approx 1/16 in, H, metal clamp to shut off manometric tube when apparatus is in use as tidal irrigator, J, standard Dakin's glass tube with four outlets, K, siphon tubing, L, collecting bottle, M, metal screw clamp to cut out siphon when doing cystometrograms, N, loop of cord supporting siphon tubing

FIG. 1

Bellis Tidal Irrigator



The irrigating fluid (I) is placed in a flask suspended at least 75 cm above the level of the symphysis pubis The flow is regulated at 40–60 drops per min by means of a screw clamp above the drip (D) The drip should not have an air vent The fluid then enters the horizontal arm of the modified glass Dakin's tube and passes into the bladder through the rubber tubing connected to the indwelling catheter It also ascends into the air vent and manometer (A), which consists of a vertical glass tube about 6–7 mm in diameter and 30–40 cm long At the bottom of this air vent a valve (V) is interposed The opening of the valve has been narrowed by fusion so that it just admits the point of a pin The height of the siphon tube (S) is adjusted to the desired pressure (FP) which the bladder must reach to initiate siphonage When siphonage is instituted, the bladder is drained rapidly and the manometer slowly, because of the valve Thus the bladder is completely emptied before the siphon is broken In the tidal irrigation of the atonic bladder a pressure of 2–5 cm of water is recommended This pressure should be increased to 10–15 cm if the bladder detrusor is intact When the apparatus is working properly, there are visible respiratory excursions in the manometer (Bellis[3])

Note—Description and illustration are taken from the original article by Bellis, and I have not been able to check them personally for accuracy

---

[3] Bellis, C J *Surgery*, 1940, 8, 791

[4] *New Engl J Med* 1936, 214 617

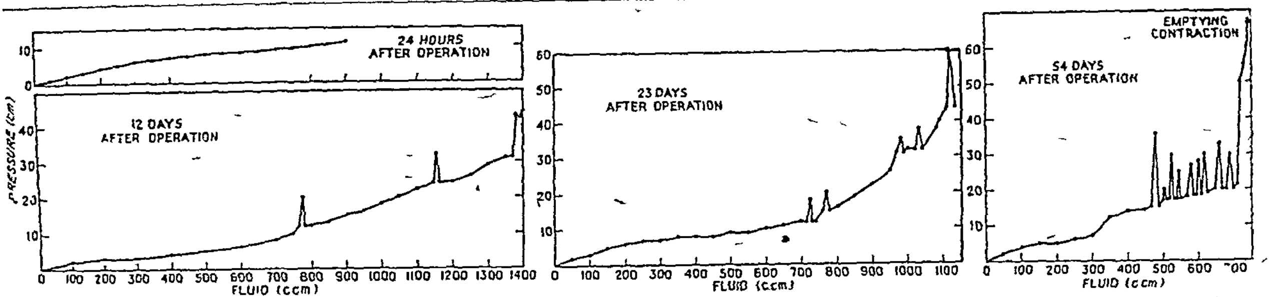


FIG 2—Four consecutive cystometrogram records on a patient with a severe dorsal cord lesion Gradual return of detrusor tone and reflex contractions are shown This patient was treated throughout by tidal irrigation and was evacuated to Canada with the set attached to a board and suspended by the side of his bed

The use of the combined tidal irrigator and cystometer ensures accurate irrigation and drainage with known quantities of irrigating fluid and under known intravesical pressures, and makes it possible to follow the changing tone of the bladder musculature as often as is desired without a change-over in apparatus

OPERATIONAL DETAILS

The fluid from the drip enters the horizontal arm of the glass Dakin's tube (J) and passes into the bladder through the rubber tubing connected to the indwelling catheter It also ascends into the air vent (G) and into the siphon tubing (K) as the intravesical pressure rises When the pressure within the bladder rises sufficiently to force the column of fluid over the siphon-tube loop, drainage of the bladder begins by siphonage The column of fluid in the air vent roughly parallels that in the siphon-tube loop When siphonage begins, fluid is drawn out of the air-vent tube at once and air is sucked in through the pin-point opening (D), but too slowly to break the siphon until the bladder is empty When the bladder is completely empty the cycle begins again It is always possible to tell at a glance if the apparatus is working properly, for respiratory excursions can be seen in the column of fluid in the air-vent tube With any block between the system and the bladder these disappear The indwelling catheter should be changed every 3 or 4 days The patient should have the workings of this apparatus explained to him and be charged with noting the respiratory excursions and the rate of drip of the irrigating fluid

For tidal irrigation the sterilised apparatus is assembled on a board to which it is attached by ties passed through holes in the board The flask containing the irrigating fluid is suspended at least 75 cm above the level of the Dakin's tube The board is then suspended so that the Dakin's tube is level with the patient's symphysis pubis The desired height of the siphon tube loop is secured by suspending it with cord passed through holes in the board Before the apparatus is connected to the indwelling catheter, fluid should be run through it to eliminate air The apparatus is connected to the catheter by a glass connecting-tube which should have a lumen at least ¼ in in diameter The clamp (B) is regulated to allow the irrigating fluid to drip at the desired rate The number of drops a minute depends on how many times a day the bladder is to be irrigated and by what quantity of fluid For example, if it is desired that the bladder be emptied when 300 c cm have been run in, and this is to be done ten times a day, the rate of delivery is 125 c cm per hour or a little over 2 c cm per min, and the drops per min would be about 50 In practice, this calculation must take into account the secretion of urine into the bladder, which goes on continually If infection is present when tidal irrigation is begun the number of daily irrigations should be increased and therefore the rate of drip speeded up This is true also if at any time during the course of convalescence symptoms of infection develop Frequent irrigations will quickly clear the urine and the symptoms of toxicity If symptoms of infection do occur during the period of tidal irrigation they usually mean that the apparatus is not working properly, and the cause should be looked for and corrected

The height of the siphon loop is that which the intravesical pressure must reach to initiate siphonage If the bladder is to be emptied when 300 c cm of fluid have been run in, the pressure within the bladder produced by this amount of fluid must be known so that the siphon loop can be set at this level A cystometrogram is always done before tidal irrigation is begun, to give data both as to the level at which the siphon loop is to be set and the tone of the bladder musculature Regular cystometrograms taken at short intervals are essential in regulating the rate of drip and the siphon tube height, for as the bladder tone improves readjustments in both must be made

For cystometry it is only necessary to close off the siphon tube by means of the clamp (M), and loosen the clamp (H) to admit fluid into the manometer tube for intravesical pressure readings With the glass Dakin's tube at the level of the symphysis pubis, the height of the column of fluid in the manometer measures the intravesical pressure The bladder should be empty before starting the cystometrogram, and fluid should drip into the bladder at about 120 drops per min Readings are usually taken at 50 c cm intervals Bladder contractions are plotted whenever they occur The cystometer incorporated in this combined apparatus is the same, in principle, as the one used by Munro It may be possible to simplify this combination even further, but the one described here has proved useful in the management of war casualties

For more detailed study of the bladder reactions and behaviour, a glass T tube may be interposed at the junction of the manometer tube (E) and the arm of the Dakin's tube The T tube is connected to a tambour and writing pen which records continuously, on a moving drum, all changes in intravesical pressure

Irrigating fluid—Sterile normal saline or one of the mild antiseptic solutions may be used as an irrigating solution At Colonel Leonard Colebrook's suggestion we have used on the last 6 cases a 0 5% solution of sulphanilamide in normal saline Higher concentrations tend to crystalise out with the variations in room temperature. Our experience so far suggests that this solution is of considerable value The sulphanilamide is not absorbed by the bladder mucosa in amounts detectable in the blood With greater knowledge of the specificity of the of the sulphonamides for various infecting organisms, it may prove valuable to add solutions of other compounds in the series to the sulphanilamide solution

SUMMARY

Continuous tidal irrigation and drainage in the care of the cord bladder is again advised as the best means of avoiding infection and other complications which continually threaten convalescence in cases of injury to the spinal cord

Repeated cystometric studies are needed for the judicious use of tidal irrigation

An apparatus is described combining a simple, practical tidal irrigator with a cystometer Although alternating irrigation and drainage is entirely automatic, this apparatus must be used with understanding and intelligent supervision

Lieut -Colonel W V Cone, chief of the neurosurgical service, has helped and advised in all phases of this work I wish also to thank Lieut Colonel E W J Akins of the Royal Canadian Engineer Corps, who helped with charts and diagrams, and Sergeant A D Melville, R C E, for his drawings

---

ORGANON LABORATORIES (London) are issuing 'Davitamon-five' tablets for the day-to-day prophylaxis and treatment of mild hypovitaminoses Each tablet contains 1000 i u vitamin A, 50 i u vitamin B_1, 200 i u vitamin C, 200 i u vitamin D, and 0 5 mg PP factor of the B complex

reduce to some extent the inconveniences and hazards of this type of bladder During the initial stage, the use of tidal irrigation gives the greatest protection

Atonic bladder results when the sensory fibres alone are destroyed This state is seen in tabes dorsalis, but rarely encountered in traumatic lesions Because of the complete loss of sensation the bladder becomes greatly distended unless the patient is trained to empty the bladder regularly by compressing the abdominal wall During the acute phase, however, tidal irrigation and drainage are again the most satisfactory methods of treatment

A fourth type is usually mentioned—the *uninhibited neurogenic bladder* Judging by its name this group should include all bladders devoid of cerebral inhibition, regardless of the site of interruption, but it is customary to apply the description only to those cases where cerebral inhibition is lost or interfered with by reason of injury to or disease of the cerebral hemispheres It is often seen in cases of frontal-lobe damage, either by tumour or by trauma, with loss of frontal-lobe substance or disturbed frontal-lobe function Precipitate micturition occurs and bladder sensation is greatly diminished Where cerebral inhibition is complete, the cystometrogram record is similar to that found with the spinal reflex bladder

TIDAL IRRIGATION AND THE CYSTOMETROGRAM

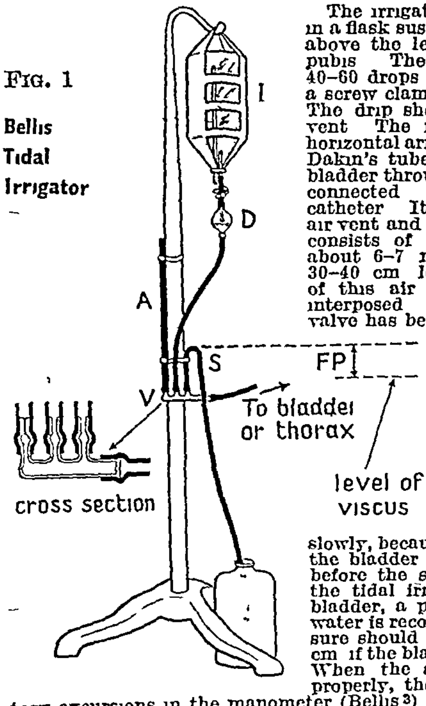
The chief task of the clinician confronted with a bladder paralysed from any cause whatever is to combat infection Repeated catheterisations invariably lead to infection, and once infection is present retention and distention contribute to the subsequent complications which seriously affect the final result

Munro was the first to emphasise the value of tidal irrigation in such cases, and he described an apparatus which he used with success All who have treated "cord bladders" in this way find that the method, besides controlling infection, greatly reduces the difficulties of nursing and medical care The need for regular catheterisation is eliminated and the hazards of bed-wetting avoided Besides taxing nursing care, bed-wetting is a paramount factor in the development of bedsores, which add greatly to the difficulties of treatment

Bellis[3] has described an apparatus for tidal irrigation which embraces the same general principles as that of Munro but is far simpler and just as effective (fig 1) Automatic tidal irrigation, working on these principles, must take into account the tone of the bladder, so that the apparatus can be regulated to irrigate at desired intervals and with specified amounts of irrigating fluid As the bladder tone changes adjustments must be made in the apparatus to ensure uniform and controlled tidal irrigation and drainage The intravesical pressure can be measured by means of a cystometrogram as increasing amounts of fluid are run into the bladder The simple cystometer described by Munro[4] is accurate enough for all clinical purposes Fluid is run into the empty bladder through an indwelling catheter attached to the cystometer, which consists of an air vent and a glass tube manometer in series The intravesical pressure is registered by the height of the column of fluid in the manometer tube and measured in cm of water above the level of the symphysis pubis By plotting the pressures at 50 c cm intervals, a curve can be drawn indicating the tone of the bladder musculature (detrusor muscle) Reflex contractions are likewise observed and recorded as a sudden rise in the pressure column due to the raised intravesical pressure In addition to serving as a guide for tidal irrigation, the cystometrogram graphically pictures the changing state of the bladder from the initial stage of spinal shock to recovery in the less severe cases, or to the establishment of a spinal reflex bladder in the case of a complete cord lesion above the sacral segments (fig 2) When the reflex contractions are observed to be sufficiently strong, tidal irrigation may be discontinued to allow the bladder to empty itself automatically This step should be supervised carefully After each reflex bladder emptying, the patient should be catheterised to determine the amount of residual urine If the amount of residual urine is considerable and the patient develops symptoms, it may be necessary to continue the tidal irrigation until the detrusor tone is such that emptying is accomplished with little or no residual urine The need for numerous cystometrograms during the period in which tidal irrigation is being used has led me to modify the apparatus described by Bellis so that a cystometer is added without harming the simplicity of the irrigator The apparatus has, *in fact*, been simplified further by attaching a small glass tip with a pin-point opening (D in fig 3) to the top of the air vent instead of incorporating this "valve" in the glass Dakin's tube itself This change makes it possible to use the ordinary glass Dakin's tube which is generally available In the Bellis apparatus this air-vent tube and valve are comparable to the reservoir bottle in the Munro apparatus, and in principle should not empty until the bladder is completely emptied Actually, it is only necessary for the pin-point opening to be small enough to ensure that the amount of air entering the system during the siphonage of the bladder is not sufficient to break the siphon action, this, together with the efficiency of the apparatus, can be tested before use by attaching a rubber balloon to the rubber tube which would normally lead to the indwelling catheter

FIG 1

Bellis Tidal Irrigator

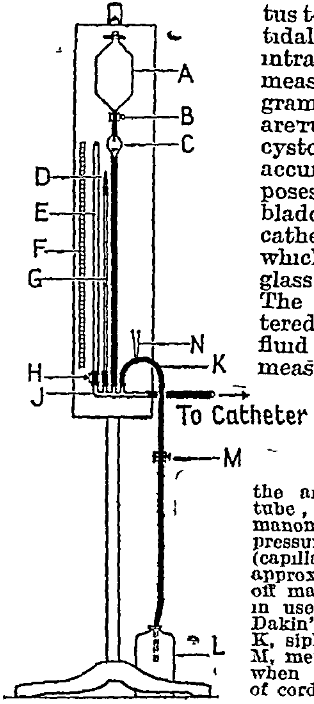


The irrigating fluid (I) is placed in a flask suspended at least 75 cm above the level of the symphysis pubis The flow is regulated at 40–60 drops per min by means of a screw clamp above the drip (D) The drip should not have an air vent The fluid then enters the horizontal arm of the modified glass Dakin's tube and passes into the bladder through the rubber tubing connected to the indwelling catheter It also ascends into the air vent and manometer (A), which consists of a vertical glass tube about 6–7 mm in diameter and 30–40 cm long At the bottom of this air vent a valve (V) is interposed The opening of the valve has been narrowed by fusion so that it just admits the point of a pin The height of the siphon tube (S) is adjusted to the desired pressure (FP) which the bladder must reach to initiate siphonage When siphonage is instituted, the bladder is drained rapidly and the manometer slowly, because of the valve Thus the bladder is completely emptied before the siphon is broken In the tidal irrigation of the atonic bladder, a pressure of 2–5 cm of water is recommended This pressure should be increased to 10–15 cm if the bladder detrusor is intact When the apparatus is working properly, there are visible respiratory excursions in the manometer (Bellis[3])

Note—Description and illustration are taken from the original article by Bellis, and I have not been able to check them personally for accuracy

FIG 3

Tidal Irrigator and Cystometer Combined



A, reservoir, B, metal screw shut off clamp, C, Murphy drip bulb (air vent in side closed), D, glass tube with end drawn out to pin point opening, connected to the top of the air vent tube by a short rubber tube, E, ¼ in glass tubing to serve as manometer for measuring intravesical pressure, F, scale, G, air vent tube (capillary tubing with inside diameter approx $\frac{1}{16}$ in, H, metal clamp to shut off manometric tube when apparatus is in use as tidal irrigator, J, standard Dakin's glass tube with four outlets, K, siphon tubing, L, collecting bottle, M, metal screw-clamp to cut out siphon when doing cystometrograms, N, loop of cord supporting siphon tubing

---

[3] Bellis, C J *Surgery*, 1940, 8, 791

[4] *New Engl J Med* 1936, 214, 617

TABLE II—CONCENTRATION OF SULPHONAMIDE COMPOUNDS IN HUMAN FÆCES, BLOOD AND URINE

—	Subject	Dosage	Fæces: When passed (hr after 1st dose)	Fæces: Concentration (mg / 100 ml)	Blood concentration (mg / 100 ml.)	Urine: When passed (hr after 1st dose)	Urine: Concentration (mg / 100 ml)
Sulphaguanidine	1	Standard	24 48	384 635	1 6 2 1*	1st 24 2nd 24	323 22
	2	,,	24	2500	1 7	1st 24	71
	3	,,	24	560	1 7	1st 24	66
	4	9 A M 3 g 2 P M 1 g	3 24	0 3900	1	at 4 4–8	37 125
	5	10 P M 3 g‡ 9 A M 2 g 2 P M 2 g 8 P M 2 g	12 17 36	495 700 2530		1st 24 2nd 24	186 (243) 44 (74)
Sulphapyridine	6	1 g 4 hrly		3 5		1st 24 2nd 24	96 135
	7	Standard	24 50	4 13	2 1 3 4†	1st 24 2nd 24	78 (105) 24
	8	1 g 4 hrly		300	6 7	1st 24	320
	9	Standard	6 30	0 0	2 8	1st 24	42
	10	,,	8 48	0 4	3 1	1st 24	44 (147)
Sulphathiazole	11	Standard	12 18 24	11 69 72	2 8	1st 24	105 (132)
	12	,,	6 12	2 4 12	3 1	1st 24	68 (89)
	13	,,	8 24	20 22	2 2	1st 24	69
	14	1 g t d s		38	1	1st 24	17 (80)
Sulphadiazine	15	2 g, 1 g 1 g, 1 g	17 34 41 48	9 9 7 tr 5 6	5 2 (5 2)	1st 24 2nd 24	37 (37) 31 (43)
	16	2 g, 1 g 1 g, 1 g	6 25	5 2 tr	2 0 (2 2)	1st 24 2nd 24	105 (105) 99 (170)
	17	2 g, 1 g 1 g, 1 g	13	0	3 8 (4)	1st 24	68 (128)
Sulpha benzamide	18	1 P M 1 g 8 P M 1 g	19 24	22 15	1 3 (1 4)	1st 4 4–18	11 8 (12 3) 32 (38)
	19	2 g, 1 g 1 g, 1 g	9 11 48	14 12 0	1 7 (2)	1st 24 2nd 24	51 (102) 43 (88)
	20	Standard	24 54	 72	1 5 (2 3)	1st 24 2nd 24	68 (99) 39 (86)
	21	,,	54	31	4 9 (4 9)	at 6 6–48	86 (115) 25 (56)
	22	,,	9 23 50	0 30 67	7 4 (7 4)	at 26	66 (100)

Subject 5 had diarrhœa subject 6 concussion subject 8 pneumonia and subject 14 pyelitis all the rest were healthy volunteers

Concentrations of total sulphonamide are shown in parentheses, all other figures are for concentration of free drug

Blood samples were taken 4 hours after the 1st dose except where otherwise indicated. * at 8 hours † at 24 hours ‡ vomited at 5 A M

the fæces on plates of McConkey's agar (Marshall et al 1940) With diets containing 4% of the drug (which proved toxic to many of the mice) the concentration of sulphathiazole in the fæces ranged from 80 to 400 mg per 100 ml and that of sulphaguanidine from 600 to 1300 mg per 100 ml The effect on the number of organisms cultivated from the fæces was somewhat irregular, but usually sulphathiazole produced a great diminution in their number, not amounting to complete suppression, while sulphaguanidine seemed to be much less effective From these rough experiments it was concluded that if a high concentration of sulphathiazole could be produced in the fæces it would probably be more effective in controlling the bacterial flora than would sulphaguanidine But since sulphaguanidine produces much higher concentrations in human fæces than sulphathiazole it is probable that under clinical conditions the advantage lies with sulphaguanidine Confirmation of this, by comparing a series of dysentery cases treated with sulphaguanidine and a similar series treated with sulphathiazole would be valuable

DISCUSSION

These observations made on a limited number of human subjects, most of whom were normal, indicate that sulphaguanidine given by mouth produces much higher concentrations in the fæces than any of the other compounds tested Admittedly the intestine of the normal person differs from that of a patient with dysentery In the latter the intestinal contents pass through more quickly, so that the time available for absorption is less, moreover, the volume of the stools passed is greater, so that the concentration of drugs in them is correspondingly diminished Nevertheless, these differences should affect all the compounds in much the same way Judgment as to the relative value of the different compounds for the treatment of bacillary dysentery must ultimately depend on a comparison of their clinical effects Meanwhile, this work supports the view that sulphaguanidine is likely to prove more useful than any of the other four here studied

SUMMARY

A study has been made of the concentrations of various sulphonamide compounds in the fæces of cats, mice and men after administration by mouth

The fæces of cats often contained high concentrations of all the compounds examined

In mice, sulphathiazole seemed to be more effective than sulphaguanidine in diminishing the number of bacteria present in the fæces, but the doses required to demonstrate this were toxic

In the fæces of normal people, sulphaguanidine was excreted in high concentrations, while sulphapyridine, sulphathiazole, sulphadiazine and sulphanilylbenzamide was found only in fairly low concentrations These results seem to support the view that sulphaguanidine will prove particularly suitable for the treatment of bacillary dysentery

I wish to thank the various volunteers, and the superintendent and medical and nursing staffs of New End Hospital, Hampstead, Mr George Brownlee, Ph.D, Colonel Leonard Colebrook, Dr Robert Cruickshank, and Messrs May & Baker Ltd for supplying the compounds; Miss Marjorie Kuck and Mr R E Leaver for technical assistance

REFERENCES

Anderson, D E W and Cruickshank, R. (1941) *Brit med J* ii 497
Bell G J (1941) *Lancet* ii, 101
Bratton A C and Marshall E K. jun (1939) *J biol Chem* 128, 537
Brownlee G and Tonkin, I. M (1941) *Nature Lond* 148, 167
Cooper M L, Zucker, R L and Wagoner, S (1941) *J Amer med Ass* 117, 1520
Marshall Bratton White H J and Litchfield, J T jun (1940) *Bull Johns Hopk Hosp* 67, 163
— — Edwards L B and Walker, E (1941) *Ibid*, 68 94
Masefield W G (1941) *Brit med J* ii 199
Ravenel, S F and Smith D L (1941) *Sth med J, Nashville*, 34, 504 (abstracted *Trop Dis Bull* 1941 38, 600)
Reitler R and Marberg K. (1941) *Brit med J* i, 277

Messrs JOHN WYETH & BROTHER (London) announce a new product, 'Alulotion,' consisting of ammoniated mercury with kaolin. It is intended for the treatment of impetigo and other skin diseases, and is available in bottles containing 3 fl oz

SULPHONAMIDE COMPOUNDS IN FÆCES

FRANK HAWKING, D M OXFD
(*National Institute for Medical Research*)

THE introduction of sulphaguanidine for the treatment of bacillary dysentery (Marshall et al 1940, 1941) is based on a new principle in the chemotherapy of sulphonamide compounds—the adoption of a compound which is poorly absorbed in the alimentary canal, so that its oral administration will produce relatively high concentrations among the contents of the large intestine. Previously the concentration of the sulphonamide compounds in the blood, urine and other body fluids has been exhaustively studied, but that in the fæces has received little attention. This paper describes an investigation of the fæcal concentrations obtained after oral administration of various sulphonamides. I hoped in this way to obtain information about their probable relative value in the treatment of bacillary dysentery.

The method used for chemical estimation was based on that given by Marshall and his colleagues (1941), modified so as to be more economical of reagents during war time. Between 1 g and 3 g of fæces, obtained by sampling different parts of the specimen, was weighed out and emulsified in 30 ml warm water; 7 ml of 30% trichloracetic acid was added and the mixture was made up to 50 ml and filtered through a fine paper. The rest of the estimation was performed according to the methods of Bratton and Marshall (1939).

RESULTS WITH CAT FÆCES

Adult cats weighing 1–3 kg. were used. They were given the compound (0.5 g per kg body-weight, suspended in gum acacia) by stomach-tube. Cats fed on a meat diet often defæcate only once in four days; by giving them bread and milk and raw liver, and by mixing phenolphthalein (0.2 g per kg) with the sulphonamide, motions (usually formed) were produced in one or two days. Blood samples were taken from the ear 6 hours after giving the drug (with a few exceptions as shown in the table). The results of this work are given in table I. Although there was some irregularity, all the compounds usually produced concentrations in the fæces considerably higher than their maximum solubility, indicating the passage of undissolved drug. Only one animal was observed with sulphanilamide, so that no conclusion can be drawn about this drug. The weight of the fæces varied from 5 to 15 g; therefore on some occasions a considerable proportion (up to a third) of the dose given by mouth seems to have been excreted in the fæces. Though the dosage in these experiments may have been rather high, cats seem to be unsatisfactory for investigating the excretion of sulphonamides in fæces, since the amount of absorption in these animals bears little relation to that found in human subjects, as the following experiments show.

TABLE I—CONCENTRATION OF SULPHONAMIDE COMPOUNDS IN THE FÆCES OF CATS, AFTER A SINGLE ORAL DOSE OF 0.5 G PER KG BODY-WEIGHT

—	Cat	Fæces		Blood	
		Mg per 100 ml	Passed (hr after drug)	Mg per 100 ml	Sample taken (hr after drug)
Sulphaguanidine	1	89	24	0.37	24
	2	187	24	0.20	24
	3	1920 75 0	< 24 24 96	0.85	6
	4	3800 182	24 48	1.5	6
	5	22 75	96 144		
	6	360	24	2.6	6
Sulphanilamide	7	32	24	28 1.5	24
Sulphapyridine	8	3400	48 -	6.1 3.5	24
	9	49	48	3.1	6
	10	790 30	24 48	8.5	6
Sulphathiazole	11	4900 159	24 72	0.25	24
	12	4 1600 400	5 24 72	1.6	24
	13	1080	96	6.2	6
	14	2500 25 0	48 72 96		
Sulphadiazine	15	3200	48	13.4 8.1	6 24
	16	150	24	9.0	6
	17	2800 9	24 48	3.7	6
	18	1600	24	11.2	6

RESULTS WITH HUMAN FÆCES

Observations on human fæces were made on 22 subjects—18 volunteers and 4 hospital patients who were receiving sulphonamide therapy for clinical reasons. A standard course was usually given to the volunteers, consisting of 3 g after breakfast, 1 g after midday and evening meals, and 1 g after breakfast next morning. Urine specimens were collected over the first two 24-hour periods following the first dose. Any deviations from this standardised procedure are indicated in table II. The doses were somewhat lower than those which would be employed in actual therapy, but enough was given to make plain the differences between the various compounds. The specimens of fæces passed were mostly of normal consistence. Table II shows that under these conditions sulphaguanidine produces high concentrations in the fæces, confirming the findings of Marshall and his colleagues (1941) and of Anderson and Cruickshank (1941). The concentrations recorded are higher than 220 mg per 100 ml which is the solubility of sulphaguanidine at 37° C (Marshall et al 1940), thus indicating the presence of undissolved drug. In case 5, which received 9 g sulphaguanidine by mouth, 1.3 g was recovered from the fæces and 3.1 g from the urine during the 48 hours after the first dose. Thus even with sulphaguanidine, the amount excreted in the urine was greater than that excreted in the fæces, and approximately half the amount given by mouth was still unaccounted for; either its excretion was delayed or it underwent chemical transformation in the body.

The other four compounds gave much lower concentrations in the fæces. In some of these cases—for example, those receiving sulphathiazole and one case receiving sulphapyridine—the concentration in the intestine might have been high enough to produce therapeutic action, especially if larger doses had been given; this may account for the favourable clinical reports which have been published on the use of sulphapyridine and sulphathiazole in the treatment of bacillary dysentery (Reitler and Marberg 1941, Ravenel and Smith 1941, Masefield 1941, Bell 1941, Cooper, Zucker and Wagoner 1941). Nevertheless the concentrations which they produce in the fæces are clearly much inferior to those following administration of sulphaguanidine. This is true even for sulphabenzamide (sulphanilylbenzamide) which was reported by Brownlee and Tonkin (1941) to resemble sulphaguanidine in its poor absorption from the intestine as judged by animal experiments. According to the limited number of results here described, it shows little or no advantage over sulphathiazole. The 5 normal people who received sulphabenzamide did not experience nausea or other discomfort from the drug.

EFFECT ON FÆCAL BACTERIA

Experiments were also made by feeding mice on a diet containing a sulphonamide compound and examining the numbers of organisms which could be cultivated from there was no rise in temperature and he gained weight steadily

In the 9 months of his illness he was given a total of 780 g of sulphonamide sulphanilamide 90 g, sulphapyridine 130 g, and sulphathiazole 560 g Changes were made to avoid renal damage, and the dose was finally fixed at 1 g of sulphathiazole every 4 hours Sulphapyridine had the most depressing effect on the patient, but sulphathiazole did not upset him in the least and he took this drug continuously for 10 weeks without a complaint

DISCUSSION

Daily intermittent fever up to 105° F is often seen in meningococcal septicæmias and is characteristic of cases of gonococcal and meningococcal endocarditis Its dramatic control each time the sulphonamides were given, and its recrudescence on withdrawal indicated the lethal effect of these drugs on all circulating organisms, and their failure to overcome the focus of origin on the heart valves The severity of the anæmia and the presence of blood in appreciable quantities in the urine were thought to contra-indicate the administration of heparin, in view of the dangerous consequences which have sometimes followed its use Indeed, the sulphonamides were given with some anxiety lest renal complications might ensue.

SUMMARY

A man with meningococcal endocarditis recovered after nine months' chemotherapy, during which he received 90 g of sulphanilamide 130 g of sulphapyridine and 560 g of sulphathiazole

Sulphonamides may thus offer a hope of cure in a condition which has hitherto been nearly always fatal

We wish to thank Dr V L Connolly, medical superintendent of this hospital, and Dr Reginald Miller for permission to publish this case, Colonel Leonard Colebrook and Dr C W Morley for their work on the bacteriological investigations, and Mr Cowfield for his blood estimations of the sulphonamides We are also indebted to Dr W R Thrower, of May and Baker Ltd for supplying us with sulphathiazole

REFERENCES

Broadbent, W H and Broadbent, J (1906) Heart Disease, London
Dickson, R. C, McKinnon, N E, Magner, D and McGillivray, N B (1941) *Lancet*, ii 631
Gwynn, N B (1931) *Arch intern Medicine*, 48, p 1110
Hartwell R M. (1939) *Amer J Dis Child* 58, p 823
Mackarell, W W (1915) *J R Army med Cps*, 25, 353
Masters, A M (1931) *J Amer med Ass* 96, 164
Saloman, H (1902) *Berl klin Wschr* 39, 1045
Steell, G (1906) Textbook of Diseases of the Heart, Manchester
Stevenson W D H (1931) *Brit med J* ii, 1173
Stott, A. W and Copeman, W S C (1940) *Lancet* i 1116
Warfield, L M and Walker, J K (1903) *Bull Ayer clin Lab* 1, 81
Worster Drought C and Kennedy, A M (1919) Cerebro spinal Fever, London, p 347

A HEREDITARY TENDENCY TO HERNIA

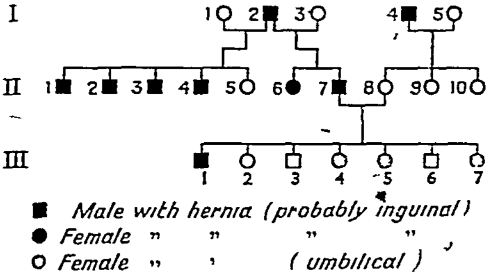
PHILIP EVANS, M D, M SC MANC, M R C P
PHYSICIAN, EMS, HONORARY ASSISTANT PHYSICIAN TO THE CHILDREN'S DEPARTMENT KING'S COLLEGE, HOSPITAL

A QUARTER of all patients with hernia give a history of hernia in parents or grand-parents (Watson 1938) The pedigree reproduced here shows an unusual proportion of a family to be affected in this way The value of the information is limited, because the children in generation III are young and may yet develop inguinal hernia, while the adults in generations I and II would probably not know if they had temporary umbilical hernias in infancy

In generation I—No 2 married twice He had a double rupture and wore a truss for years, this information was supplied by II no 8 after she had consulted her husband II no 7 No 4 developed a hernia at the age of 74 and wore a truss

II —No 1 developed a hernia at the age of 4 years and wore a truss until he was at least 18 years old Nos 2, 3 and 4 have hernias but no details are known The exact ages are unknown, but all are over 45 No 6 is ruptured, age now between 42 and 45 No 7 is 41 years old He developed a hernia in one groin at the age of 30, and it was cured by operation soon afterwards When he was 38 a hernia appeared in the other groin and was treated by operation a year later

III —No 1 is 11 years old, he had a right inguinal hernia in infancy, with a radical cure at the age of 1¾ About a year later a left inguinal hernia developed, and was treated operatively 3 years afterwards On examination the inguinal operation scars were visible, the left testis was in the scrotum, the right was fixed subcutaneously in the region of the external ring No 2 is aged 8, and has no rupture No 3 is aged 7, and has no rupture No 4 is aged 6, his navel stuck out after birth and was strapped by the district nurse for 6 months, after which it was all right No 5 is aged 4, the navel was "turned inside out" after birth and was strapped by the nurse for a year, no rupture now No 6 is aged 3, and has no rupture No 7 is aged 1¼, she was a small premature baby and now weighs 18 lb, she started to walk, holding on to the furniture, 6 weeks ago, and the navel was then noticed to be "turned inside out", she has a small umbilical hernia, and there is one inch of separation of the recti



In brief, a man with hernia had 5 sons, all with hernia, and 2 daughters, 1 with hernia One of his sons married a woman whose father developed a hernia late in life The eldest son of this union developed hernia as a child These hernias were probably inguinal, but in addition 3 of the 6 children in the third generation had umbilical hernias in infancy Umbilical hernia and divarication of the recti are common in American negro babies, but 3 instances in an English sibship are unusual

Macready (1893), after careful study, concluded that inheritance was an agent (though perhaps a remote one), in the production of hernia Watson (1938) saw a patient with inguinal hernia and partially descended testis who said that his father and his father's father had had the same condition Hanrart (cited by de Lange 1936), Stransky (1925–26), de Lange (1936) and Kellett (1939) have reported the development of bilateral inguinal herniation in identical twins, which may be taken as evidence of a constitutional but not necessarily hereditary tendency to hernia The anatomical or physiological basis of the tendency is unknown but this note is written in the hope that others, particularly the family doctors of patients with hernia will be able to produce further and more detailed information about its inheritance

SUMMARY

There is a familial tendency to hernia

An account is given of a family of 22 members of whom 12 had inguinal or umbilical hernias

REFERENCES

Kellett C E (1939) *Arch Dis Childh.* 14, 265
de Lange, C (1936) *Ibid* 11, 39
Macready, J F C (1893) A Treatise on Ruptures London
Stransky E (1925–26) *Mschr Kinderheill* 31, 613
Watson, L F (1938) Hernia, London

MEASURE FOR VITAMIN C —Use of the oxidation-reduction indicator dichlorophenolindophenol, for the estimation of vitamin C in biological fluids and foodstuffs, is widespread A revised edition of a booklet on the method (The Colorimetric Determination of Oxidation-Reduction Balance, 3rd ed Pp 22) has just been published by British Drug Houses and is timely The theory of the method is well summarised, but the authors do not go deeply into the underlying mathematics and physics The value of the book which is free on request, would have been enhanced by a table of references

MENINGOCOCCAL ENDOCARDITIS

J. G. Cutts, M R C S G Krafft, M R C S
P H Willcox M B CAMB , M R C P
MEDICAL OFFICERS, EMS

The meningococcus is one of the rarest of the organisms which attack the heart valves and endocardium The other pathogenic cocci which do so are *Streptococcus viridans, Strep hæmolyticus,* gonococcus, pneumococcus and staphylococcus, in that order of frequency Although meningococcal endocarditis has been noted as a rare complication of meningococcal septicæmia during the last forty years, particularly in America, it is remarkable that no cases seem to have been reported in this country during or since the recent epidemic of cerebrospinal fever, in which meningococcal septicæmia as a cause of unexplained pyrexia was increasingly recognised Among the 17 cases of meningococcal septicæmia reported by Stott and Copeman (1940), and the 26 cases in Canadians described by Dickson and his colleagues (1941), endocarditis was never diagnosed The clinical picture of septicæmia—in which fever, muscle and joint pains and skin lesions are prominent—is quite distinct from that of meningococcal endocarditis

Since 1902, when meningococcal septicæmia was originally described by Salomon, some 24 cases of infection of the heart valves by the meningococcus have been reported Over half of these have been complicated by fatal terminal meningitis The valvular lesions, consisting of ulcerative destruction with vegetations on the mitral or aortic valves or both, have been demonstrated at autopsy In several cases (Mackarell 1915, Stevenson 1931) the organism has been found in the heart valves In almost all cases the lesion was suspected during life on account of persistent fever, cardiac murmurs, blood-cultures and embolic phenomena The interval between the original infection and the terminal meningitis varies from 8 months (Gwynn 1931) to 7 days (Hartwell 1939), the usual period being less than 6 weeks

Warfield and Walker (1903) described a case with daily intermittent fever, headache, delirium and herpes, in which the patient died after a month An ulcerative lesion of the mitral valve was found at autopsy but no evidence of meningitis, there were renal and splenic infarcts Similar cases have been recorded in America since Worster-Drought and Kennedy (1919) diagnosed the lesion in their case during the second week, by blood culture and by apical systolic and diastolic murmurs, the illness lasted 6 weeks Cases where the illness lasts many weeks have been recorded, but are rare Graham Steell (1906) alluded to the occasional association of malignant endocarditis with cerebrospinal fever, and Broadbent (1906) stated that the meningococcus may rarely be the cause of that disease Of the 12 cases of this type which we have been able to trace, 5 recovered from an illness indistinguishable from subacute bacterial endocarditis, and the organism was cultured from the blood The remaining 7 died after some months, only one having lived for as long as 8 months (Gwynn 1931) In 4 of these, meningitis was found at autopsy, and in 5 the meningococcus was recovered from the vegetations In only one case was there a history of rheumatic fever

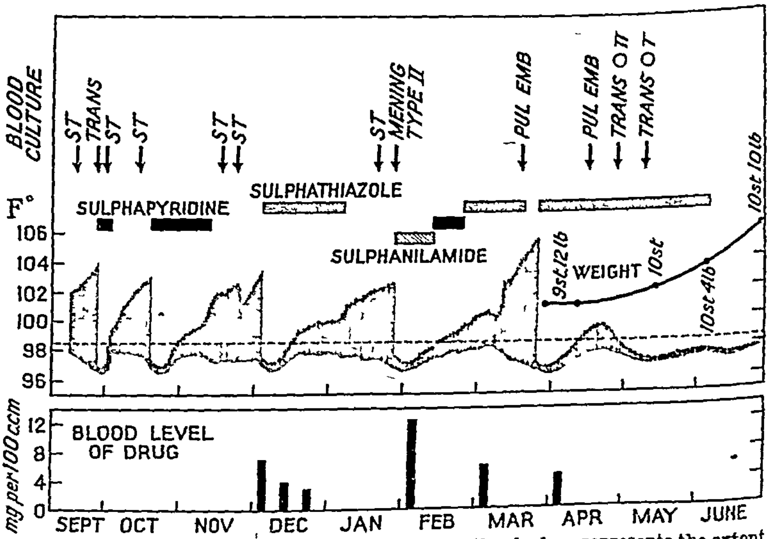
The temperature in these cases is typically of the daily intermittent type and the patient's condition is relatively good despite the degree and duration of the fever (Masters 1931). Clubbing of the fingers is absent Our case is of interest on account of its response to sulphonamides It seems that these must be given in full doses over a long period

CASE-HISTORY

A sergeant of 27 was admitted to an EMS hospital on Sept 12, 1940, with malaise, profuse night sweats and anæmia, he had no other symptoms In 1936 he had been ill for 6 weeks with gastritis, relieved by alkalis and dieting He was on active service in Palestine during 1937–38, and had been perfectly fit up to the onset of the present illness There was no history of rheumatic fever He was called up in September, 1939, and soon began to feel off colour His malaise became worse in January, 1940, and he complained of epigastric pain after meals, relieved by alkalis, but he was able to continue on duty until the autumn He was admitted to a hospital other than ours on Sept 3, 1940, with cough, night sweats, epigastric tenderness, slight splenomegaly, and temperature swinging to 103° F Blood count red cells 5,500,000, Hb 57%, white cells 9900, sedimentation rate 62 mm per hr A rough diastolic murmur was heard at the aortic area, with a soft systolic apical murmur, fine crepitations at the lung bases Sulphapyridine, 1 g every 4 hours, for 2 days brought the temperature down, and the drug was then discontinued When he came under our care, 9 days later, his temperature was normal but started to swing to 103° F almost at once Blood-counts showed an increase in the hypochromic anæmia, but no other change, cultures sterile The patient became increasingly ill Urine showed a cloud of albumin with some red cells A fine petechial eruption appeared on the hands and feet Agglutination reactions negative to the enteric group of organisms, no malarial parasites found A diagnosis of bacterial endocarditis was made

On Sept 21 a blood-transfusion of ½ pint was given A week later a course of sulphapyridine was begun with dramatic effect He changed within 8 hours of the first dose from fevered prostration to quiet ease This change was later repeated whenever chemotherapy was re instituted after having been withheld for a time (see chart) On only two occasions—during March and towards the end of April—did the drug fail to control the temperature, the cause in each case being a right basal pulmonary embolism A radiogram taken on March 28 showed an enlarged heart and consolidation at the right base, both of which were also demonstrable clinically The sulphonamides were withdrawn at intervals in order that blood cultures might be obtained, but these were negative until Jan 29, 1941, when a group II meningococcus was reported After this, sulphonamides were given regularly every 4 hours until June 3, when the patient appeared to be cured After the first pulmonary embolism the drug failed to control the fever and was accordingly withdrawn for a few days, and for a fortnight before the embolism some variations were tried, to determine the minimum dose Otherwise there were no breaks in the sulphonamide therapy

In May the patient's weight started to rise, and in June, after the temperature had been normal for over a month, the drug was gradually withdrawn By then he had no fever His sedimentation-rate was now 7 mm per hr The anæmia had been cured by two blood-transfusions and large doses of iron, white cells remained remarkably constant at about 14,000 per c mm, and only a few red cells were found in the urine Radiologically, heart and lungs were normal, an electrocardiogram showed no signs of myocardial damage, though a soft basal diastolic murmur persisted for many months, being loudest to the left of the sternum He remained under our care for a further 4 months, during which



Treatment and findings In the temperature chart the shading represents the extent of swing *ST* = sterile, *TRANS* = transfusion

THE LANCET

LONDON. SATURDAY, MARCH 7, 1942

CALLING IN THE SURGEON FOR PEPTIC ULCER

BILLROTH performed the first "Billroth I" operation in 1881 for the removal of a carcinoma of the pylorus[1]. Later the same year a young pupil of his, WÖLFLER, attempted the master's operation on a similar case but found the tumour fixed and the liver involved; he began, no doubt regretfully, to close the abdomen, when NICOLODANI, an assistant, whispered in his ear. WÖLFLER picked up the jejunum, brought it across the front of the colon with a long loop and attached it to the anterior surface of the stomach. That was the birth of gastro-enterostomy, the impromptu first execution of an operation whose subsequent fortunes, as well as whose performances, have been many and varied. In the earlier part of this century the discovery of duodenal ulcer as a disease combined with the relative simplicity and safety of the operation and the optimism of surgery in the hey-day of its expansion made gastro-enterostomy popular not only for ulcer or for pyloric obstruction but for a wide variety of functional disorders of the stomach as well. Since then its use has been restricted to cases of organic disease, but even among them its application has of late years been steadily curtailed. One might have expected that after sixty years its value and its limitations would have been clearly defined; that they are not yet plainly evident is due in part to the extraordinary variation in the natural history of peptic ulcers and in part to the lack of critical appraisal on the part of surgeons and physicians and to the inadequacy of their long-term records. The same is true of other operations for the relief of peptic ulcer. It is not yet possible to turn from the literature to Mr Smith with his uncomplicated duodenal ulcer and say with confidence that if operated on in such and such a way he will have an *x* per cent. chance of cure or a tolerably comfortable life, a *y* per cent. chance of this or that subsequent complication, and a *z* per cent. chance of postoperative death, and to compare these prospects with those he might expect under good medical management. Nor will such precision ever be attainable, for Mr Smith's future way of life, Mr Smith's "constitution," and even the quality of Mr Smith's surgeon and physician are all imponderables. Mr Smith's general practitioner, however, must constantly strive to get a little nearer such precision, for his is the major voice in the choice of Mr Smith's treatment. So he should be aware of the trend of good surgical experience.

In the Mayo Clinic, where the presence of malignancy in chronic peptic ulcer of the stomach is held to be 8–10%, surgical treatment is undertaken in 60% of patients with gastric ulcers[2]. Of 105 patients in 1940, 88 were submitted to partial gastrectomy, 12 to gastro-enterostomy, and 5 to local excision; only one of those died, after a partial gastrectomy. If it were justifiable to generalise from those figures it would be clear that gastrectomy is the treatment of choice because the likelihood of malignancy is so much greater than the risk of operative death. In the Massachusetts General Hospital in 1930–39,[3] 14% of cases diagnosed as gastric ulcer proved to be malignant. Of a whole group of 277 cases 92 were operated on: 69 underwent partial gastrectomy, 23 gastro-enterostomy. The fatality from partial gastrectomy for benign ulcer was 6·9%. The margin between this and 14% is less than the Mayo Clinic figures but still seems to justify partial gastrectomy as the treatment of choice. However, when the site of the ulcer is taken into account it appears that only about 10% of lesser-curve ulcers are found to be malignant, compared with 65% of prepyloric ulcers and 100% of greater-curve ulcers. Weighing operative risk against the risk of malignancy in lesser-curve ulcers no longer gives a clear-cut indication for gastrectomy—opinion would incline towards the operation in the case of larger ulcers and in older people, away from it in smaller ulcers and in younger people. The operative risk is clearly the first major consideration in approaching this question. It can be assessed in this way with some degree of precision against one other factor, the risk of malignancy. But the series quoted above are small ones, and even if they were a fair sample of what happens in good American hospitals they do not necessarily apply elsewhere. We need to know whether the risk of malignancy is as high in Britain as in America, especially in those areas where gastric ulcer, relative to duodenal, is so much more common and is oftenest on the lesser curve; and the individual practitioner would wish to know the fatality-rate of gastrectomy in the hands of the surgeon or at least of the hospital of his choice. Unless he considers that rate to be well below the risk of malignancy he should hesitate to influence patients with lesser-curve ulcers in the direction of gastrectomy, at least until medical management has had every possible chance; where medical treatment has failed he has to weigh the operative risk against the risk of malignancy plus the degree of invalidity resulting from a persistent benign ulcer—a task of judgment beyond the scope of arithmetic. He must also take into account the chance that an immediately successful partial gastrectomy will not secure the patient from further gastric symptoms: this, however, is small, for in the series from the Massachusetts General Hospital it was only 4%, whereas medical treatment was unsuccessful in 12%.

Turning to duodenal ulcer, we have a simpler problem because the risk of malignant change drops out. We have general agreement that gastro-enterostomy is no longer the best treatment for uncomplicated duodenal ulcer in younger patients, this for two reasons—first that it is too often followed by recurrence of the dyspepsia, sometimes with stomal ulceration, and second that, from a better knowledge of the natural history of the disease, it is suspected that many patients who recovered good digestion after gastro-enterostomy would have done so equally well under medical management or perhaps even untreated. The indication for gastro-enterostomy in duodenal ulcer is now simple and clear; it is persisting pyloric obstruction in the presence of a low gastric acidity, and is usually found in patients over fifty. The fatality-

---

[1] Judd, J. P. Ann. Surg. 1941, 114, 850.

[2] Gray, H. K., Walters, W., and Priestley, J. T. Proc. Mayo Clin. 1941, 16, 721.

[3] Allen, A. W., and Welsh, C. E. Ann. Surg. 1941, 114, 481.

Reviews of Books

The Man who Lived for Tomorrow

A biography of William Hallock Park, M D WADE W OLIVER New York E P Dutton Pp 507 $3 75

THE title of this book aptly describes W H Park In 1895 the death-rate from diphtheria in New York City was 250 per 100,000, in 1936, when the William Hallock Park Laboratory was dedicated, the rate was less than 1 per 100,000 His remarkable record in the fight against diphtheria is told clearly and unsensationally It is a far cry from 1888, when an American professor of children's diseases proclaimed infected sewer gas to be the cause of diphtheria, to Park's last years (he died in 1939), when scientists were chiefly concerned to improve a prophylaxis which was giving sound protection against diphtheria to 95% of those immunised Yet it is salutary to modern pride to recall that as early as 1886 Lœffler used the guineapig test to recognise avirulent diphtheria-like bacilli, and that in 1892 intubation was the method of choice in the Willard Parker Hospital Park, in 1893, was connected with what claims to be the first diagnostic laboratory ever established by a department of health, in 1894 he watched the cheering results obtained with the first antitoxin brought from Europe to America, and saw public subscription bring in $8000 to buy 60 horses for the manufacture of the new marvel As long ago as 1895 antitoxin was provided free in New York City to doctors attending patients unable to pay for it

Park's long history of association with diphtheria never faltered, he took measures to reduce serum rashes, based on the work of Banzhaf and Gibson on concentration, in 1913 he demonstrated to America the soundness of the Schick test, from 1914 onwards, in the first field-test ever properly controlled, he established the high value of active immunisation with toxin-antitoxin mixtures, and in 1933 he immunised in public the millionth child in New York City—the first child of the second million being injected by Bela Schick himself Park wrote successful books on bacteriology and on public health, thanks to his energy every advance in the fields of tuberculosis, meningitis, typhoid, poliomyelitis, scarlet fever and pneumonia was promptly and judiciously applied in his city Though a pioneer he was not a great scientific discoverer, but he was indefatigable in using all sound procedures straight away and in having new promising ones tried under his critical eye These and other events from the life of a devoted public servant of unfailingly kindly temperament are soundly documented and set forth soberly and well

Synopsis of Diseases of the Heart and Arteries

(2nd ed) GEORGE R HERRMANN, M S, M D, F A C P London Henry Kimpton Pp 468 25s

THIS synopsis can be recommended though in this country the price may be considered rather high It is more a practical textbook than a synopsis, the whole of cardiology, including peripheral vascular disease, is adequately covered Type and reproductions are of a uniformly high standard, except for one of the electrocardiograms Now and again statements appear which will not be universally accepted, such as "most patients with heart disease are of a nervous temperament" Some may become "nervous" as a result of faulty treatment, but many are placid A topically valuable section is the concluding one on military cardiovascular examinations, based largely on experience of what the author refers to as "World War I" Kymography, radiology and electrocardiography have all received adequate attention, but unnecessary space is not devoted to them at the expense of clinical aspects Barring the index, which needs some revision, the whole work is essentially practical

War in the Mind

CHARLES BERG, M D Lond, D P M, physician to the Tavistock Clinic London Macaulay Press Pp 272 8s 6d

DR Berg says in the preface that he has aimed to interest the general reader and to "provide the would-be practitioner with an easy, practical and I hope even an entertaining introduction to the subject" the subject is psycho-analysis With candour he reproduces a letter he had from Professor Freud, containing the passage—"You will understand that I entertain certain suspicions against the technique of analysts who have made the popularisation of analysis their aim" The ordinary medical reader for his part entertains certain suspicions about the discrepancy between the psycho-analyst insisting upon a minimum of four years training in this subject and the psycho-analyst writing an easy introduction not only for the physician but (see dust-cover) "for the student of his own and other people's psychology" The non-medical student of his own and other people's psychology may after reading the easy introduction decide to attempt a little psycho-analysis on his own, expecting the remarkable successes detailed in the case histories composing this book Certainly Dr Berg gives little indication of the limits of psycho-analytic treatment, and there is an odd "postscript for psychiatrists" with Lamarckian implications Nevertheless the writer has attained his object the book is an easy, practical and entertaining introduction to psycho analysis

Gould's Medical Dictionary

(5th ed) Editor C V BROWNLOW London H K Lewis Pp 1528 36s

DR George Gould issued his first medical dictionary in 1890 under a sense of vocation for he claimed that no monograph or textbook has so far-reaching and lasting influence as a modern encyclopædic dictionary. And he agrees with Simon Browne that we should "thank God for everything and therefore for dictionary makers" He has had his reward by having as many readers as Liverpool has inhabitants—and not only in America, for no other English-speaking country has yet produced a first-rate medical lexicographer This edition has been enlarged by several hundred new words and by the addition of tables of prefixes and suffixes The print and arrangement are uniformly good, but the illustrations are hardly worthy of the text To be adequate they would require a companion atlas One feels too that a little more grouping of information might have been attempted, for example, the reader seeking information about sulphonamides would have welcomed a list of the chief ones now on the market, instead of being told to "see sulfanilamide, prontosil and others of the sulfonamide group" And the student of the salmonella organisms might have been spared the task of hunting through 4½ pages of tables for his facts But no doctor could have the volume on his desk without being kept safely in the strait literary way

Happy Marriage

NORMAN E HIMES London Allen and Unwin Pp 368 12s 6d

DR Norman Himes, who has already contributed much to the literature on birth control and allied subjects, has here done exceptionally well, this practical book deals with the many problems of sexual and married life, in a way which will help the reader without annoying him Here is no preaching of an elder to the young, no tedious moralising, but a mass of information and constructive advice on almost every aspect of heterosexual relationship Dr Himes suggests how to look for a mate and how to choose one, how to predict the chances of happiness in marriage, discusses the engagement period and the pros and cons of early marriage, advises on whether to buy or lease a house, considers whether wives should work, gives hints on balancing the family budget and on making the best use of money, ruminates over factors influencing happiness in marriage and on the art of getting along with your mate, and ends with four brief but excellent chapters on sex life and adjustment in marriage, birth control and sterility There are many references to modern statistical findings particularly those of Terman, Burgess and Cottrell, thus the views expressed are based on more than personal opinion or impression The marriage prediction and adjustment tests devised by Burgess and Cottrell are discussed and set out in detail, doing the tests provides good winter evening entertainment though some of us may be disappointed to find we can only get a third or fourth class pass The book has been adapted for the English reader by Lella Secor Florence than good may be done by injudicious attempts at therapy The results of treatment must be judged in the light of the knowledge that natural healing can take place, that almost all corneal lesions improve for a time but may then relapse, that frequent relapse, often without symptoms either in rabbits or men, is characteristic of all severe lesions, and that end-results are usually long delayed Thus the assessment of therapeutic trials must inevitably be difficult

MACHINE TOOLS OF MASS RADIOGRAPHY

IMPROVEMENT in the apparatus for mass radiography of the chest has been so rapid during the last five years that it is now possible to obtain screen miniatures of consistently high quality The idea is much older than that McINTYRE of Glasgow, within twelve months of Rontgen's great discovery, wrote[1] "the thought occurred to me that it might be useful to photograph the fluorescent screen" His experiments were brilliant, and he records his naïve surprise at finding on the miniature screen picture also a large shadow of the camera lens and brass mountings, but unstable X-ray tubes, poor fluorescent screens and coarse-grained emulsion doomed these experiments to failure Fifteen years later[2] CALDWELL, one of the early American X-ray martyrs, worked out the basic principles of screen photography and predicted its modern applications with uncanny accuracy He might almost have foreseen the production in Holland of the rotating anode tube, of the 'fluorazure' screen in London, of the wide aperture lens in Germany, and of fine-grain film here and in America It now remains to make the apparatus compact and transportable The first large scale application was carried out by DE ABREU[3] in Brazil in 1930 and all modern apparatus is based on his ingenuity His work was closely followed in Germany, and in 1938 mass radiography was an established item in the war preparations of the Third Reich[4] With typical German thoroughness a miniature radiogram became an essential part of the recruit's overhaul Examination of the whole urban population was begun but interrupted before completion by the outbreak of hostilities The first paper[5] on the subject published in this country was by DORMER and COLLENDER of Durban, and COLLENDER has since perfected[6] an apparatus whereby the factors of time and distance are made identical with those for full-size radiography He is the fortunate possessor of an f/0 85 lens with a focal length of 8 5 cm, and his apparatus is so arranged that exposures are made in 1/10 sec at 5 feet He uses two rotating anode tubes facing two upright stands Two patients stand side by side and a smooth mechanism quickly moves the camera and tunnel from one stand to the other COLLENDER chides us for not adopting his technique at once, but he will be pleasantly surprised when he sees the superb results now being obtained in London by Miss K C CLARK with less elaborate equipment and slightly different technique The delay in the adoption of mass radiography in England has given us an opportunity to study results elsewhere Many chest surveys have been done—some with full-size films and some with screen miniatures—by various states, tuberculosis associations, insurance companies and large-scale employers in America, in London by the Royal College of Physicians under the Prophit bequest, and elsewhere as our correspondence columns indicate It is noteworthy that in surveys by trained radiologists on full-size films the results are more uniform than those obtained by health officers and factory medical staff with screen miniatures, where the proportion of positive diagnoses has varied between 1 and 6% Obviously the value of this method—as indeed of any other method—depends on the skill and experience of the diagnostician At present there is general agreement that interpretation is at least ten per cent more accurate with full-size films, but it remains to be seen whether this discrepancy yields to standardised technique and highly trained observation No trouble should be spared to make the screen miniature a success, for economy of time and of material are on its side

---

[1] McIntyre J *Lancet* 1896 ii, 1303
[2] Caldwell, E W *Amer Quart Roentgenol* 1911 3, 34
[3] de Abreu M *Fortschr Röntgenstr* 1938 58 574
[4] Janker, R Leuchtschirmphotographie Leipzig 1938
[5] Dormer, B A and Collender K G *Lancet* 1939, i, 1309
[6] Collender and John H G *Trans S Afr Inst elect Engrs* Nov 10, 1941

Annotations

ANÆSTHESIA DURING CHEMOTHERAPY

IT seems that in prescribing sulphonamides for patients destined for the operating table we have unwittingly been killing two birds with one stone—recent research suggests that sulphonamides may also act as basal hypnotics Adriani,[1] working with mice, found that the daily injection of sulphanilamide made the animals more susceptible to the anæsthetising action of barbiturates, and under the influence of sulphanilamide the minimal lethal dose of the barbiturates was also less When chloroform, ether, nitrous oxide, cyclopropane or tribromethanol were used as the anæsthetics, however, he found no difference between the behaviour of control rats and those receiving sulphanilamide Butler and his colleagues[2] have re examined this subject in greater detail, and they do not accept all of Adriani's conclusions after making a statistical analysis of his published data In Butler's experiments the sulphonamides were fed to male white mice on a basal diet of purina, special care was taken over randomisation of the animals used in the control and sulphonamide groups, and absorption of the drug was checked by blood-sulphonamide estimations The anæsthetics selected for investigation were chloroform, ether and pentobarbital, representing types widely different in chemical constitution and pharmacological action Statistical examination of their results showed that feeding of sulphanilamide, sulphapyridine, sulphathiazole, sulphadiazine, or N4 acetylsulphanilamide to mice for 2½ days caused them to be anæsthetised by smaller amounts of pentobarbital than were normal mice The median lethal dose of pentobarbital was also reduced by about the same absolute amount as the median anæsthetic dose, in other words, the previous administration of a sulphonamide had the same effect as an extra dose of the anæsthetic itself, and the safety margin was practically unchanged Results of the same kind were obtained with ether and chloroform Thus, contrary to Adriani's conclusions, the effect is not confined to the barbituric-acid series of anæsthetics Twenty four hours after withdrawing sulphonamide medication the basal hypnotic action had partly disappeared A blood-sulphanilamide of 6 mg per 100 c cm reduces the effective anæsthetic dose by 28% The mechanism of the interaction between the sulphonamides rate in the hands of the average competent surgeon is probably about 1–2%; no treatment other than surgical is of any avail. For those ulcers where surgery is sought on account of persistence of crippling dyspepsia despite medical management, or because bleeding has often occurred and recurrence is feared, or because obstructive symptoms are developing while the gastric acidity is high, the modern operation of choice is partial gastrectomy. In the Mayo Clinic this is now performed on nearly half the duodenal ulcer patients who come to operation,[2] whereas six years ago it constituted less than 10% of operations for duodenal ulcer; at the same time a larger proportion of duodenal ulcer patients are being treated medically, so that the average severity of the disease in those patients reaching the surgeon is greater, and is held to justify the more dangerous procedure. The balancing process here weighs the operative fatality plus the chance of postoperative disability on the one hand against the likelihood that medical management will not achieve tolerable health on the other. Again it is judgment, not arithmetic, which comes into play, but it is well to know the figure for the one ingredient that can be roughly measured—namely, the operative fatality. In 1936 Eusterman and Balfour[4] said that 4·8% of patients undergoing gastric resection for duodenal ulcer in the Mayo Clinic died in hospital. In 1940 the Mayo Clinic figure was 3·9%.[2] So the practitioner who, despairing of medical treatment in Mr Jones with his non-obstructing duodenal ulcer, calls in a surgeon, is exposing Mr Jones to a 1 in 20 or 1 in 25 chance of dying in a few weeks. That is on the assumption that the surgeon and the hospital or nursing-home are together capable of results equal to those of the Mayo Clinic. In many cases the risk is probably much greater. So the practitioner, who has no figures before him from the surgeon or hospital of his choice, would usually be wise to assume a 5–10% fatality for this operation, and to ask himself whether the state and prospects of his patient warrant taking that risk. If in doubt, let him redouble his efforts to understand and alter the patient's way of living in such a way as to promote the healing of his ulcer.

---

[1] Adriani J *J Lab clin Med* 1939, 24 1066
[2] Butler, T C, Dickison, H L Govier W M, Greer, C M and Lawson, P D *J Pharmacol* 1941, 72, 298

CORNEAL DAMAGE BY MUSTARD GAS

Two remarkable facts about mustard-gas lesions of the cornea emerged from the use of this gas in 1917–18. One is the ability of the cornea to heal spontaneously without opacity or loss of substance; the other is the development of long delayed sequelæ. Spontaneous corneal healing is the most probable end-result in the vast majority of eyes of those who survive exposure to gas. According to the Medical History of the War,[5] in a follow-up of about a third of all the gassed cases among the British only ten were seen with an infiltrated ulcer in which vision was permanently impaired by opacities of the cornea, and there were only four cases of panophthalmitis requiring removal of the eye. The passage of time has modified this favourable prognosis but only by the addition of a very small percentage of patients who have since revealed the existence of a latent complication. This is the so-called delayed keratitis described by T. J. Phillips,[6] who observed that men who had been exposed to mustard gas in 1917–18 were being seen from time to time for signs which were unfamiliar in ophthalmology, and who collected 70 cases at Moorfields. The total number of these patients in relation to those exposed was small; all had been exposed to very large doses of the gas; the delay in onset of symptoms varied from six to twenty years and the interval was said to be symptom-free. The association of mustard gas and of mustard gas only with these lesions was thus suspected but not proved. The existence, in the interval, of some slowly developing but symptomless process was also suspected and again lacked proof.

In order to make up for these deficiencies Miss Ida Mann and Dr B. D. Pullinger[7] have studied the action of the gas experimentally in rabbits and also in the few laboratory cases that this war has produced. Rabbits, whose pathological processes are speeded up in accordance with their shorter life (about 7 years) to about ten times the pace of those of man, are convenient subjects in which to trace the whole history of the lesion. The course of events depends on where the gas is applied and thus also on the total dose. Spontaneous healing without delayed sequelæ, with at the worst a faint nebula, follows invariably if the cornea alone is affected and no damage is done at the corneoscleral junction. When the corneoscleral junction, which is vascular in contrast with the rest of the cornea, is affected the end-result is variable. It depends chiefly on the dose of gas but partly also on its distribution and the damage done at the corneoscleral junction, to the conjunctiva and to the lids. It is only when a very large dose gains access to all these structures that the eye is lost early. A smaller amount may lead either to spontaneous healing after a peculiar type of vascularisation of the cornea, or, after many months, to a lesion corresponding to the human one known as delayed keratitis. This lesion has proved to be a degeneration rather than an inflammation, for after a long period of symptomless vascularisation the vessels begin to recede and as they do so deposits of cholesterin and fat appear in the substantia propria of the cornea in the region formerly occupied by vascular loops. After a time, if these deposits are near the surface, the epithelium over them is shed leaving a small shallow ulcer from the base of which the crystals have disappeared. The epithelium then heals, but new ulcers appear and the process is repeated many times over. Exactly why some of the vascular lesions end this way and others heal without this complication Mann and Pullinger do not discuss. They imply that the severity of the lesion in one particular anatomical distribution is directly proportional to the dose. But it should be remembered that both rabbits and men have a tendency, showing individual variations, to form lipoid deposits especially in avascular sites. The intima of blood-vessels is said to be avascular in certain animals, and probably in man, and it is here that in man and rabbits individual variation is seen in respect of cholesterin and fatty deposits.

Mann and Pullinger have dealt only with the clinical pathology and not with treatment, but some inferences can be drawn from their paper. In this as in other spontaneously healing lesions more harm of the wall containing the oxyntic cells being affected Such experiments showed that blood-supply was an important factor in the regulation of gastric function, but did not indicate that vasopressin necessarily played any part in regulating that function in the normal body The only evidence that vasopressin played a physiological rôle was that the gastric secretion and the responses of the gastric blood-flow to secretory stimuli were abnormal in hypophysectomised cats, except in one which had apparently normally functioning posterior pituitary tissue still present Vasopressin injections in rabbits also caused a profound macrocytic anæmia,[4] though the cause of this is still debatable These findings as a whole caused little stir in physiological circles and it remained for the clinicians to provide supporting evidence. Thus Jones[5] in 1938 described a patient who had a hypochromic anæmia, hypertension, decreased glucose tolerance and achlorhydria He suggested that this was a case of hyperfunction of the posterior lobe of the pituitary, and workers in Dodds's laboratories[6] were able to demonstrate large amounts of pressor and antidiuretic activity in the patient's urine As the patient's symptoms disappeared so did the pressor and antidiuretic activity of his urine More recently, Keith Simpson[7] reported a case in which a severe gastric lesion followed fracture of the base of the skull At autopsy, done 44 hours after the accident which caused the fracture, it was found that there was laceration and hæmorrhage of the pituitary stalk and of the tuber immediately over the gland There was also hæmorrhagic necrosis of the stomach, which was confined to the oxyntic cell-bearing area and was unrelated to any local injury The lesions are strikingly similar to those produced in experimental animals by vasopressin, and both Dodds and Keith Simpson regard the lesions as identical It seems reasonable to suppose that they are caused by the same means Simpson also reported the case of a boy who suddenly developed hæmatemesis three days after fracture of the base of the skull; he died 5 weeks later, and the stomach was then normal These clinical findings certainly support the experimental suggestion that there is some physiological relation between the functions of the posterior pituitary gland and of the stomach If clinicians bear the possibility in mind more cases illustrating the relation may be found

---

[4] Eusterman, G. B. and Balfour, D. C. The Stomach and Duodenum, Philadelphia, 1936.

[5] Medical History of the War, London, 1922, Surgery, vol II, p 531.

[6] Proc. R. Soc. Med. 1940, 33, 229.

[7] Ibid, 1942, 35, 229.

THE EYE AS A CAUSE OF GENERAL DISTURBANCES

THE eye is a specialised part of the nervous system and is not structurally more prone to pathological changes than the rest of that system, nor is ocular disease more likely to have general repercussions than disease of other tissues A better case can be made for the tonsils, sinuses and teeth, for infection of these often affects the general health, while ocular infection has no such consequences Apart from melanoma of the uveal tract, rare primary tuberculous infection of the eye, and such curiosities, it is difficult to think of an eye disease with systemic complications, though some ocular lesions are complications, or rather aspects, of general disease

Disturbances of vision—of mechanism not structure—may, however, influence well-being The eye is not only a specialised nervous tissue receiving and translating stimuli that reach it but also a compact mechanical device concerned with the collection of such stimuli Moreover, the two eyes act as a single organ, so that their coördination presents problems of its own Ophthalmology, the most precise of clinical studies, was the first to postulate that the functional activities of organs have pathological aspects as well as physiological limits Long before functional disturbances of the alimentary and circulatory systems were recognised the conception of asthenopia had been reached Mackenzie,[1] who introduced the term in 1843, regarded the symptoms as due to retinal exhaustion, which made it necessary for the patient to give up all work and take long sea-voyages, in the succeeding forty years the rôle of accommodation, refractive errors, and imbalance of the extraocular muscles came to be clearly appreciated But many promising beginnings run to extremes As soon as Donders's[2] work became translated into feasible clinical terms by Cuignet's introduction of retinoscopy into ophthalmic practice, an army of uncritical observers welcomed the correction of refractive errors as a panacea Even at the beginning of the twentieth century the correction of refractive errors was being advocated as a cure for epilepsy Gould,[3] in six enthusiastic volumes left few historical disasters or misfortunes unexplained—they all arose from uncorrected refractive errors among the great Accepted observations on the significance of moderate degrees of hypermetropia and of presbyopia as a cause of headache were the forerunners of a belief that small errors were just as significant or even more so Theoretical and practical difficulties that did not fit in with this uncritical opinion were—and sometimes still are—ignored The correction of small refractive errors implies an accepted standard of normality, this was supplied by the conception of emmetropia, but the fine methods of retinoscopy showed that ideal emmetropia is decidedly exceptional The correction of small errors also introduced the personal factor—patient and observer often gave different readings of the error to be corrected Particular attention was paid to small degrees of astigmatism The relief of symptoms had to be explained on the dubious hypothesis that the ciliary muscle (in violation of the all-or-none law of muscular contraction) contracted in one meridian so as to counteract the astigmatic error, in fact the ciliary muscle was almost endowed with intelligent behaviour Yet the fact remained that such errors could often be found in patients without symptoms Today the correction of hypermetropia of medium degree for the relief of headache is an accepted fact, and the reaction against the correction of refractive errors has perhaps gone too far

Anomalies in muscle-balance have an almost parallel history The use of complicated mechanical tests for motor imbalance overlooked the fact that muscle activity is a dynamic process, and that instruments such as Stevens's phorometer might introduce defects in muscle action which were not necessarily present clinically The occlusion method advocated by Marlow[4] also appears to give artificial results The use of prisms for the correction of muscle imbalance is today far less widespread than it was in the past A more interesting phase has developed of late years with recognition of the plastic nature of muscle activity This is the basis of orthoptic practice which aims at treating anomalies of muscle action, and is distinct from fusion training in squint, which has psychological implications Stutterheim,[5] in 1931, noted that artificial diplopia induced by prisms placed base out in front of the eyes could be overcome involuntarily up to a certain point, and to a much greater extent by voluntary effort In stimulating and developing this voluntary capacity means have been found to overcome symptoms of asthenopia in patients who do not respond to other methods of treatment Convergence is phylogenetically a recent acquirement and is thus particularly prone to disturbances of function The case for treatment based on these principles is and anæsthetics has not yet been explained Intensive sulphonamide therapy often causes drowsiness and mental depression, but Butler and his co-workers show that sulphanilamide alone does not produce anæsthesia even when the concentration in the blood is as high as 24 mg per 100 c cm Another interesting observation is that even when the drug is administered intravenously some delay occurs before the basal hypnotic effect becomes apparent This suggests that a comparatively slow chemical change is a necessary preliminary to the onset of this curious pharmacological action, and Butler mentions the possibility that the mechanism may include the inhibiting in the tissues of an enzyme system The probability of sulphonamides being used as basal anæsthetics can be dismissed as negligible Again, the induction of anæsthesia by means of volatile and non-volatile drugs is achieved by gradually increasing dosage, and the anæsthetist is guided by the reaction of the individual patient rather than by noting the amount of the anæsthetic that has been given Undoubtedly it is desirable that the anæsthetist should be aware that his patient has been receiving sulphonamides, and he may expect to use rather less anæsthetic than he would otherwise have required, but this is not likely to be of great practical importance Some adjustment of dosage might, however, have to be made where a measured quantity of anæsthetic is given, as with ‘Avertin’ Perhaps the main interest of the apparent interaction of the sulphonamides and the barbiturates lies in its opening up a new field for the investigation of the mode of action of sulphonamides in the tissues Another series of experiments on laboratory animals might be undertaken to determine whether the curative action of the sulphonamides in various infections is influenced by the simultaneous administration of barbiturates and related compounds

---

[4] Dodds and Noble *Nature Lond* 1935, 135, 788
[5] Jones E I *Lancet* 1938 1 13 *Proc R. Soc Med* 1940, 33 503
[6] Noble Rinderknecht H and Williams *Lancet* 1938, 1, 15
[7] *Guy's Hosp Rep* 1940–41 90 21

[1] Mackenzie, W *Ann Oculist, Paris*, 1843, 10 97
[2] Donders, F C On the Anomalies of Accommodation and Refraction of the Eye, London 1864
[3] Gould G M. Biographic Clinics London, 1903–07
[4] Marlow F W The Relative Position of Rest of the Eyes and the Prolonged Occlusion Test Philadelphia 1924
[5] Stutterheim N A *Brit J Ophthal* 1931, Suppl 5 p 5

CARDIAC ARREST ON THE OPERATING TABLE

MODERN anæsthetic methods may have reduced but certainly have not abolished the incidence of cardiac arrest, and in this emergency the tendency is to rely less on so-called cardiac tonics and more on certain general measures These measures are summarised by Adams and Hand[1] in discussing a remarkable case in which during lobectomy for bronchiectasis the heart stopped for 20 minutes, the patient ultimately making a complete recovery As they point out, stoppage is usually due to one or more of three factors—idiosyncrasy to the anæsthetic, ventricular fibrillation or a vasovagal reflex In their case, in which cyclopropane was the anæsthetic, the cardiac asystole occurred 2 hours after the beginning of anæsthesia and was probably a vasovagal reflex effect They make the following recommendations Prophylaxis consists in reducing vagal excitability to a minimum, and blocking the afferent and efferent pathways of the vagus The first is attained by ensuring adequate oxygenation, particularly of the medullary centres, since depression of these by narcotics enhances the excitability of the vagus The second entails adequate local anæsthesia, especially if any local manipulation such as aspiration of the trachea is to be carried out, and giving atropine sulphate preoperatively in sufficient dosage (gr 1/75) as well as during the operation if it is a long one If the heart stops treatment may be summarised under the two headings of artificial respiration and artificial circulation Respiration is maintained by an endotracheal tube, preferably with a balloon cuff attachment which ensures a closed system Carbon-dioxide absorption is essential, and adequate pulmonary ventilation is obtained by rhythmic pressure of 12–16 mm Hg at 28–32 per min on the rebreathing bag The circulation is kept going by rhythmic manual compression of the heart synchronised with the artificial respiration, for which accessibility of the heart is necessary This is easily managed in operations on the chest or abdomen, and in operations elsewhere it is recommended that the heart should be rapidly exposed by an intercostal incision in the anterolateral aspect of the chest cutting the costal cartilages above and below the incision Cerebral circulation is assisted by having the patient in the partial Trendelenburg position Cardiac stimulants, such as adrenaline, are considered merely incidental to the rest of the treatment These recommendations have the merit of being based on sound physiological principles, the first of which is that if recovery is to be complete the cerebral tissues must be kept well oxygenated

REMOVAL OF URETERIC CALCULI BY TRACTION

MANY instruments have been devised for removing ureteric calculi by intracystoscopic methods, but they are all either inefficient or dangerous It is impossible to grasp a stone impacted in the ureter without at the same time running the risk of grasping the ureteral mucosa Even if this is avoided dragging the stone through the lower portion of the ureter is likely to bring with it a portion of mucous membrane, an accident which may result in a stricture For this reason many urologists have discarded all such methods except that of passing a ureteric catheter beyond the stone, leaving the catheter for a time in position, and then removing it after injecting some lubricant into the ureter Finney[1] of South Carolina, describes an ingenious way of removing small stones impacted in the lower end of the ureter which is apparently free from danger and was successful in all but one out of fifty cases A number 6 X ray catheter is modified by inserting a silk suture in the distal end, care being taken to tie the knot as small as possible With a wire stylet in position the catheter with its thread is passed beyond the calculus up to the renal pelvis When this has been reached the stylet is removed and a loop of catheter formed by pushing it further onwards and at the same time pulling on the thread The loop is then brought down the ureter until it engages the calculus There is no doubt when this occurs, for firm resistance is encountered The cystoscope is then removed and the patient returned to bed A small scale is attached to the ends of the doubled catheter and the nurse is instructed to exert a pull of two pounds on the scale every hour or two for 24 hours, maintaining traction only for a short while At the end of that time the patient is given a short anæsthetic and a pull of five pounds is exerted by the urologist himself There was no accident or severe reaction in the fifty cases so treated and all but three proved successful at the end of 24 hours Treatment was continued in the three refractory cases, two being successful in 34 and 42 hours respectively The third case was treated by the open operation at the end of 72 hours It is doubtful whether any other method of manipulative treatment has given such excellent results

POSTERIOR PITUITARY GLAND AND THE STOMACH

EIGHT years ago Dodds and his colleagues[2] demonstrated the production of severe gastric lesions in animals injected with large doses of vasopressin Subsequent experiments[3] showed that vasopressin acted through its vasoconstrictor properties—if small doses of vasopressin were injected the increase in blood flow that was a necessary concomitant of gastric secretion was prevented, and the secretion was inhibited, if larger doses were given, the gastric ischæmia was more severe and the acid contents of the stomach then acted on the stomach wall to produce the lesion, only that area

---

[1] Adams, H D and Hand, L V *J Amer med Ass* 1942, 118, 133

[1] Finney, R P *J Amer med Ass* 1941 117, 2129
[2] Dodds, E C Noble, R L and Smith E R *Lancet*, 1934, ii, 918
[3] Cutting W C, Dodds, Noble and Williams, P C *Proc roy Soc* B, 1937, 123, 27 39, 49

Special Articles

MEDICINE AND THE LAW

A Chapter of Accidents

A CURIOUS story was told in the House of Commons on Feb 18. A former miner named Grossett, 45 years of age, had six accidents between 1929 and 1938. The cartilage of his right knee was removed in 1929; a muscle of his heart was strained and one of his hands was poisoned in 1930. In 1931 he broke a leg and in 1935, after four years' freedom from injury, he broke his collar-bone and a rib. Another three years of immunity followed; then in 1938 he strained his back and in 1939 he broke a leg again. He is said to have received at this point the written intimation which some firms send to workers whose history shows such a proneness to disability, warning him that the colliery would feel unable to employ him further if he had another accident. In July, 1941, he registered under the appropriate coal-mining order of the Ministry of Labour and National Service; he duly recorded the fact that he had worked as a stripper in coal mines but declared himself unwilling to go back to the pits. The Ministry caused him to be medically examined in August, 1941, by Dr X, who certified him fit for underground employment in mining. In the following month he was ordered by the national service officer to take up work as a stripper and machine-man at one of the collieries of the Fife Coal Co. He appealed, as he was entitled to do, to the local appeal tribunal, producing medical certificates from two doctors that he was unfit for work underground; the general secretary of the Fife Miners Union gave similar evidence. The appeal tribunal seems to have accepted the single opinion of Dr X against the medical and other evidence called on behalf of Grossett, the direction that he should go to work at the colliery was upheld. On his refusal, he had to appear before the sheriff court (which in Scotland has a criminal jurisdiction roughly corresponding to that of the justices at petty or quarter sessions in England) for his disobedience to the law. The sheriff sentenced him to 14 days' imprisonment. It was apparently inherent in the proceedings that the sheriff could not re-hear the case on the merits but had merely to decide whether Grossett had disobeyed the order and, if so, to impose such penalty as he might deem fit.

The Lord Advocate, responsible for the administration of justice in Scotland, made the Government's reply. He had felt obliged to direct that Grossett be prosecuted. Defence Regulation 58B authorises the Ministry of Labour and National Service "or any national service officer" to direct any person to perform such services as may be specified in the direction, "being service which in the opinion of the Minister or officer, he is capable of performing." Miners were wanted in the pits; this man was registered as an ex-stripper; after leaving the pit, he had been working (in September, 1940) as a foreman on a concrete shuttering plant on the Rosyth housing scheme. This work might not be comparable with work at the coal face underground, but at least there had been reasonable inquiry into the medical side of the case. The minister or his officer is not obliged to consult a doctor, but Dr X had been consulted and had declared the man fit. The safeguard of appeal, under the National Service regulations, had been applied. The local appeal tribunal of three members (two of them possessing technical qualifications) had examined the evidence and had unanimously decided that Grossett was fit for this work which he had been directed to undertake. The national service officer had reissued his direction according to the tribunal's recommendation. Moreover on Jan 27 last Grossett did in fact go to work as directed, at the coal face. While (as the Lord Advocate conceded) it was too early yet to say whether his health would be affected or whether he would be able to remain at full work as a miner for the duration of the war, he is, so far as is known, still working in that capacity.

Mr Gallacher, M P, who had brought the matter up in the debate on the adjournment, declared himself dissatisfied with the Lord Advocate's reply and announced that he would take the matter further with the Minister of Labour. Perhaps the most disturbing element in the case had been his statements (privileged when made in Parliament) that Dr. X, whom Mr Gallacher's informants admitted to be a practitioner of considerable standing, was not regarded by Fife miners as impartial: he had, it was said, on other occasions given certificates or otherwise passed men as fit for work where there was strong medical opinion to the contrary. This feeling on the part of the workers that a particular doctor is not fair to them is, of course, not unfamiliar in workmen's compensation cases, particularly where the doctor is one who habitually advises on the opposite side. The debate also raised the general question whether the lay tribunal should not be replaced by some kind of medical referee or medical board whose opinion would be final. The Lord Advocate was naturally not concerned to defend the terms of the law for which the Minister of Labour and National Service is responsible; he was meeting the criticism that the sheriff had somehow failed in the judicial duty to be fair. This task he succeeded in discharging. If the circumstances of the case indicate that the "control of employment" orders do not always work smoothly, it is at least satisfactory that in this country a grievance against the executive can be promptly ventilated in the legislature, and an answer obtained, even in the midst of a total war.

CROSS-INFECTION IN WARDS

A DISCUSSION at the Epidemiology section of the Royal Society of Medicine on Feb 27 was opened by Dr ROBERT CRUICKSHANK, who defined cross-infection as infection of a patient in hospital with the causal agent of a disease other than that for which he was admitted. This definition enlarges the original conception of cross-infection to include both manifest and latent infection. In addition, cases may be cross-infected with other biological types of the organism responsible for the primary infection—e g, in streptococcal, pneumococcal and diphtheritic infections. The problem concerned not only infectious diseases hospitals but also children's wards, maternity units, infant and day nurseries, ear, nose and throat wards, and in war-time, general surgical units. Examples illustrating the extent of the problem were a streptococcal cross-infection rate of over 50% in a measles ward, with two-thirds of the cases clinically and the others latently affected (Allison), more than 60% of the clinical complications in scarlet fever due to cross-infection and an average stay in hospital of 52 days for the complicated case compared with 27 days for the uncomplicated (De Waal), 14 outbreaks of streptococcal infection in four ENT wards during 3½ years (Okell and Elliott) and 13% of 551 children cross-infected with the streptococcus during one year's admissions to a children's department (J Wright). Undoubtedly the streptococcus was the arch-enemy but staphylococcal infections in infant nurseries, outbreaks of neonatal diarrhœa and of diarrhœa and vomiting among older infants, and cross-infection with the diphtheria bacillus in diphtheria, scarlet fever and measles wards were all too frequent occurrences calling for more enlightened handling. Dr Cruickshank divided cross-infection into three categories—respiratory or inhalation, intestinal or ingestion, and contact or implantation—and discussed the reservoirs and channels of spread of each. He thought more attention must be given to the air as the vehicle for the spread of respiratory infections; terms such as "direct contact," "air-borne" and "droplet" infection needed to be more clearly defined. He wondered if the rôle of the symptomless streptococcal throat carrier in spreading infection was not over-emphasised. For the control of cross-infection the reservoirs must be attacked and the channels blocked. Sulphonamides were proving a useful new ally and local sprays might be used more for the streptococcal throat. Patients should be encouraged to cover their coughs and sneezes with handkerchiefs, masks should be more freely worn by nurses, and convalescent patients must not be allowed contact with ill patients. Infected dust was a major problem in wards housing streptococcal and diphtheritic patients and until its dissemination was prevented—e g, by oiling bed-linen and floors—the relative importance of other channels in the spread of respiratory infection could not be ascertained. Search for carriers with the desoxycholate-citrate medium had proved valuable in the control of outbreaks of Flexner and Sonne dysentery strengthened by the experiences of Williamson-Noble[6] who in a series of 117 patients obtained satisfactory results in 89 He has also drawn attention to the use of lenses to overcome aniseikonia or inequality in the refractive state of the two eyes In the elaboration of these newer methods, greater critical faculty is being shown both in the making and the interpretation of observations than was the case with the pioneers of refractive error correction The psychological make-up of the patient must, of course, be taken into account and indeed is unlikely these days to escape attention, but this is less a reason for an attitude of cynical nihilism towards the method than for tempering enthusiasm with caution

INTRAVENOUS GUM

THE diuretic action of the intravenous injection of 6% gum acacia solution (or indeed any other solution exerting a suitable colloid osmotic pressure) in cases of nephrotic œdema has been ascribed to its attracting water from the œdematous tissues Goudsmit and his associates[7] cast doubts on this theory They find that although intravenous gum does produce diuresis accompanied by a greatly increased excretion of chlorides in these cases, yet the colloid osmotic pressure of the serum and the plasma volume do not undergo any great change Unfortunately there is a discrepancy between their figures for the colloid osmotic pressure of the plasma and the values calculated from the serum protein concentration For example, one of their patients had a serum-protein concentration of 4 1 g per 100 c cm and an albumin globulin ratio of 1 1 1 This gives concentrations of 1 9% for albumin and 2 1% for globulin, and colloid osmotic pressures respectively of 142 5 and 42 mm of water But their figure for the total colloid osmotic pressure of the serum was 88 mm of water against the calculated total of 184 5 mm In a later paper,[8] however, they point out that there is an increase in plasma volume averaging 28% after intravenous acacia injection and that this is accompanied by a reduction in hæmoglobin and serum-protein percentage due to simple dilution They also give more figures for the serum osmotic pressures and show that a difference of 1% in protein and acacia concentration leads to a difference of 60 mm and 48 mm respectively in the osmotic pressure The fact that total colloid osmotic pressure sometimes falls after intravenous acacia seems to be accounted for by the dilution of the serum proteins from the increased plasma volume consequent on this fluid entering the circulation The exact mechanism of the diuresis which results remains to be determined, but it is still a possibility that diuresis is initiated by the increased blood-volume, any reduction of which by loss of fluid via the kidneys increasing the serum osmotic pressure and this in its turn attracting more fluid from the œdematous tissues—a sort of benign cycle which would only stop when no more œdema fluid remained

RESEARCH IN INDUSTRIAL MEDICINE

Prof A W M ELLIS, M D, F R C P, has been appointed by the Medical Research Council to a whole-time position on its scientific staff as director of research in industrial medicine Professor Ellis has been director of the medical unit at the London Hospital, holding a chair of medicine in the University of London We have published recently the results of his prolonged investigation of Bright's disease carried on with Dr Horace Evans and Dr Clifford Wilson The investigations to which he will now apply himself will be directed to the problems of industrial toxicology which are of special importance during the war

TRAUMA AND LEUKÆMIA

THIERSCH[1] has raised again the question of whether trauma plays any part in the ætiology of leukæmia His patient, a man of 51, received injuries to the head and left arm, shoulder and hip in a motor car accident, there were no fractures, but he was unconscious for 8 days When he recovered he noticed some enlarged lymph-glands in the left axilla and groin, unfortunately little attention was paid to them and it was not until 5 months after the accident that a blood count was made and revealed a lymphatic leukæmia Subsequently typical anæmia and enlargement of spleen and lymph glands appeared This patient was reasonably entitled to compensation for the disability caused by the accident, but was he entitled to compensation for the disability and probable shortening of life entailed by the lymphatic leukæmia? This is a question of topical interest, some members of the Forces are going to develop leukæmia anyhow, and they are abnormally exposed to trauma, can the leukæmia be put down to conditions of service? In 1930 Lewsen[2] described a case and reviewed the literature, he found 40 cases with sufficient evidence to justify consideration Among other points he noted that the injury was most often to the long bones, ribs and spleen, but in some there was just a general shaking, the leukæmia appeared at periods from a few days to 4 years after the injury, and all the cases—with one doubtful exception—had myeloid leukæmia This limitation to myeloid leukæmia was interesting, because the obvious reply to the case in favour of trauma causing leukæmia is that it is just a coincidence, especially since the incidence of leukæmia among the injured is not significantly different from that among the general population But if myeloid leukæmia were produced every time, a case might be made for unusual stimulation of or injury followed by repair in the marrow leading to a leukæmic state, much as a case has been put forward for the initiation of bone sarcoma by injury Thiersch's patient, however, had lymphatic leukæmia and so had a patient reported on by Norikoff[3], this point therefore fails to convince The problem is similar to the argument that has gone on about the possible traumatic origin of tumours Ewing[4] says that six criteria must be satisfied if a case is to be made out at all (1) authenticity and adequacy of the tumour, (2) previous integrity of the wounded part, (3) a reasonable time relation (3 weeks to 3 years), (4) continuity of symptoms of the injury with those of the tumour, (5) microscopical or other proof of the existence and histological type of a tumour, and (6) location of the tumour at the point of injury Thiersch's case satisfies points 1, 2, 4 and 5, but with regard to 6 there is no special evidence of injury to the lymphoid tissue except that scattered about the well protected bone-marrow, and with regard to 3 swelling of lymph glands was noticed 8 *days* after the injury If trauma were a cause of leukæmia we should be expecting an increased incidence under present conditions, it has not so far appeared and there is no evidence that it did in 1914–18 The relation of trauma to tumour formation is complex, but, as Ewing points out, the striking fact is the comparison between the ability of specific agents and the failure of simple trauma to produce malignant tumours in normal tissues Even if a case can be established for traumatic tumours, the evidence cannot be lightly applied to leukæmia, in man at any rate, for though everyone recognises that trauma has "neoplastic tendencies" any further definition is arguable Lewsen's case failed to convince the courts, and until more definite evidence is available "not proven" must be our verdict too

---

[6] Williamson Noble, F A *Ibid* 1941, 25, 399

[7] Goudsmit A and Binger M W *Arch intern Med* 1940, 66, 1252, Goudsmit Binger and Keith, N M *Ibid*, 1941, 68, 513

[8] Goudsmit, Binger and Power, M H *Ibid*, 1941, 68, 701

[1] Thiersch J B *Med J Aust* 1941, ii, 504

[2] Lewsen, S C *Lancet*, 1930, i 288

[3] Norikoff A S Quoted by Forkner, C E Leukæmia and Allied Disorders New York 1938

[4] Ewing, J Neoplastic Diseases Philadelphia 1940

Special Articles

MEDICINE AND THE LAW

A Chapter of Accidents

A CURIOUS story was told in the House of Commons on Feb 18 A former miner named Grossett, 45 years of age, had six accidents between 1929 and 1938 The cartilage of his right knee was removed in 1929, a muscle of his heart was strained and one of his hands was poisoned in 1930 In 1931 he broke a leg, and in 1935, after four years' freedom from injury, he broke his collar-bone and a rib Another three years of immunity followed, then in 1938 he strained his back and in 1939 he broke a leg again He is said to have received at this point the written intimation which some firms send to workers whose history shows such a proneness to disability, warning him that the colliery would feel unable to employ him further if he had another accident In July, 1941, he registered under the appropriate coal-mining order of the Ministry of Labour and National Service, he duly recorded the fact that he had worked as a stripper in coal mines but declared himself unwilling to go back to the pits The Ministry caused him to be medically examined in August, 1941, by Dr X, who certified him fit for underground employment in mining In the following month he was ordered by the national service officer to take up work as a stripper and machine-man at one of the collieries of the Fife Coal Co He appealed, as he was entitled to do, to the local appeal tribunal, producing medical certificates from two doctors that he was unfit for work underground, the general secretary of the Fife Miners' Union gave similar evidence The appeal tribunal seems to have accepted the single opinion of Dr X against the medical and other evidence called on behalf of Grossett, the direction that he should go to work at the colliery was upheld On his refusal, he had to appear before the sheriff court (which in Scotland has a criminal jurisdiction roughly corresponding to that of the justices at petty or quarter sessions in England) for his disobedience to the law The sheriff sentenced him to 14 days' imprisonment It was apparently inherent in the proceedings that the sheriff could not re-hear the case on the merits but had merely to decide whether Grossett had disobeyed the order and, if so, to impose such penalty as he might deem fit

The Lord Advocate, responsible for the administration of justice in Scotland, made the Government's reply He had felt obliged to direct that Grossett be prosecuted Defence Regulation 58B authorises the Ministry of Labour and National Service "or any national service officer" to direct any person to perform such services as may be specified in the direction, "being service which, in the opinion of the *Minister or officer*, he is capable of performing" Miners were wanted in the pits this man was registered as an ex-stripper, after leaving the pit, he had been working (in September, 1940) as a foreman on a concrete shuttering plant on the Rosyth housing scheme This work might not be comparable with work at the coal face underground, but at least there had been reasonable inquiry into the medical side of the case The minister or his officer is not obliged to consult a doctor, but Dr X had been consulted and had declared the man fit The safeguard of appeal, under the National Service regulations, had been applied The local appeal tribunal of three members (two of them possessing technical qualifications) had examined the evidence and had unanimously decided that Grossett was fit for this work which he had been directed to undertake The national service officer had reissued his direction according to the tribunal's recommendation Moreover on Jan 27 last Grossett did in fact go to work, as directed, at the coal face While (as the Lord Advocate conceded) it was too early yet to say whether his health would be affected or whether he would be able to remain at full work as a miner for the duration of the war, he is, so far as is known, still working in that capacity

Mr Gallacher, M P, who had brought the matter up in the debate on the adjournment, declared himself dissatisfied with the Lord Advocate's reply and announced that he would take the matter further with the Minister of Labour Perhaps the most disturbing element in the case had been his statements (privileged when made in Parliament) that Dr X, whom Mr Gallacher's informants admitted to be a practitioner of considerable standing, was not regarded by Fife miners as impartial, he had, it was said, on other occasions given certificates or otherwise passed men as fit for work where there was strong medical opinion to the contrary This feeling on the part of the workers that a particular doctor is not fair to them is, of course, not unfamiliar in workmen's compensation cases, particularly where the doctor is one who habitually advises on the opposite side The debate also raised the general question whether the lay tribunal should not be replaced by some kind of medical referee or medical board whose opinion would be final The Lord Advocate was naturally not concerned to defend the terms of the law for which the Minister of Labour and National Service is responsible, he was meeting the criticism that the sheriff had somehow failed in the judicial duty to be fair This task he succeeded in discharging If the circumstances of the case indicate that the "control of employment" orders do not always work smoothly, it is at least satisfactory that in this country a grievance against the executive can be promptly ventilated in the legislature, and an answer obtained, even in the midst of a total war

---

CROSS-INFECTION IN WARDS

A DISCUSSION at the Epidemiology section of the Royal Society of Medicine on Feb 27 was opened by Dr ROBERT CRUICKSHANK, who defined cross-infection as infection of a patient in hospital with the causal agent of a disease other than that for which he was admitted This definition enlarges the original conception of cross-infection to include both manifest and latent infection In addition, cases may be cross-infected with other biological types of the organism responsible for the primary infection—e g, in streptococcal, pneumococcal and diphtheritic infections The problem concerned not only infectious diseases hospitals, but also children's wards, maternity units, infant and day nurseries, ear, nose and throat wards, and, in war-time, general surgical units Examples illustrating the extent of the problem were a streptococcal cross-infection rate of over 50% in a measles ward, with two-thirds of the cases clinically and the others latently affected (Allison), more than 60% of the clinical complications in scarlet fever due to cross-infection and an average stay in hospital of 52 days for the complicated case compared with 27 days for the uncomplicated (De Waal), 14 outbreaks of streptococcal infection in four ENT wards during 3½ years (Okell and Elliott), and 13% of 551 children cross-infected with the streptococcus during one year's admissions to a children's department (J Wright) Undoubtedly the streptococcus was the arch-enemy but staphylococcal infections in infant nurseries, outbreaks of neonatal diarrhœa and of diarrhœa and vomiting among older infants, and cross-infection with the diphtheria bacillus in diphtheria, scarlet fever and measles wards were all too frequent occurrences calling for more enlightened handling Dr Cruickshank divided cross-infection into three categories —respiratory or inhalation, intestinal or ingestion, and contact or implantation—and discussed the reservoirs and channels of spread of each He thought more attention must be given to the air as the vehicle for the spread of respiratory infections, terms such as "direct contact," "air-borne" and "droplet" infection needed to be more clearly defined He wondered if the rôle of the symptomless streptococcal throat carrier in spreading infection was not over-emphasised For the control of cross-infection, the reservoirs must be attacked and the channels blocked Sulphonamides were proving a useful new ally and local sprays might be used more for the streptococcal throat Patients should be encouraged to cover their coughs and sneezes with handkerchiefs, masks should be more freely worn by nurses and convalescent patients must not be allowed contact with all patients Infected dust was a major problem in wards housing streptococcal and diphtheritic patients and until its dissemination was prevented—e g, by oiling bed-linen and floors—the relative importance of other channels in the spread of respiratory infection could not be ascertained Search for carriers with the desoxycholate-citrate medium had proved valuable in the control of outbreaks of Flexner and Sonne dysentery

He was certain much more could be accomplished in the prevention of cross-infection by care in the admission of patients, a full use of up-to-date laboratory methods, control of infected dust, revision of ward-regulations, and instruction of nursing staff so as to gain their intelligent cooperation in the maintenance of aseptic nursing and good ward discipline

Dr R H Dobbs, in discussing cross-infection in children's hospitals, said the objective must be to keep beds free at a time when pressure on them was greatest, and that was in the winter months when infection and epidemics were most common To attain this objective, admission of infection to the open ward must be kept as low as possible and infection when it occurred must be prevented from spreading Ward closure and disinfection were wasteful and usually unnecessary The solution was threefold (1) satisfactory hospital design with admission cubicles, small ward units and adequate isolation accommodation, (2) a high standard of medical and nursing skill and alertness to detect infection among new admissions and in the ward before irretrievable damage was done, and (3) utilisation of certain immunological principles whereby immunes and non-immunes could be readily detected, and prompt measures taken to protect the susceptible children These included isolation of suspected or manifest infection, bacteriological search for carriers, passive and/or active immunisation against measles, diphtheria and scarlet fever, redistribution of immunes and non-immunes and immobilisation of cases in the ward, and a sharp lookout for early cases of secondary infection If the streptococcus was now the most common cause of secondary infection in a children's hospital, gastro-enteritis was still the most fatal Dr Dobbs thought that visitors, if epidemiologically indefensible, were often curatively beneficial

Dr N D Begg dealt more specifically with the control of gastro-enteritis and streptococcal infection in infectious diseases hospitals The control of non-specific gastro-enteritis was still a major problem in wards with a *fair proportion of infants At the LCC Eastern hospital* cases admitted with enteritis are nursed in completely separate cells, feeds are prepared in a special milk-room and the full aseptic technique of an isolation block is used In two years, among 390 admissions including 57 severely ill cases, there were only 3 instances of secondary infection Dr Begg stressed the value of breast-feeding and the inadvisability of admitting mild cases of enteritis Cross-infection with the streptococcus was not only responsible for many of the complications of scarlet fever but was also the cause of most of the late septic complications in measles and diphtheria. In diphtheria secondary streptococcal infection could be largely prevented by a careful clinical and bacteriological control of new admissions In measles such a control is usually not practicable but isolation of septic infections—e g, otitis media—as soon as they occur is a useful measure Separation of convalescent cases in special wards or hospitals had not been very successful but more careful clinical selection accompanied by bacteriological control might yield better results After discussing the rôle of staff carriers and the merits of bed-isolation, Dr. Begg dealt with the evidence—still mostly circumstantial—for the spread of streptococcal infection through the air by dust or droplet nuclei, and the methods that may be used for their control He thought there was a danger of over-emphasising "bacteriological" cross-infection

Mr Wylie McKissock described his experience of wound cross-infection and its control in a neurosurgical unit In 15 months there had been 14 cases of cross-infection, representing 4 2% of the total admissions 3 of these cases died, 8 others had clinical infections necessitating a long stay in hospital and only 3 were latently infected During the past 11 months when a new dressing technique (see *Brit med J* 1941, ii, 375) had been in force, the cross-infection rate was 0 8% compared with a rate of 15 4% in the 4 months prior to its introduction Mr McKissock paid tribute to his bacteriological colleagues for their help in discovering and preventing this wound cross-infection, and suggested that a similar technique would minimise the occurrence of cross-infection in ENT wards

In the subsequent discussion the President (Dr E H R Harries) thought that aseptic nursing had to be "rationalised" to meet the needs of diseases of varying infectivity Dr Philip Evans described his experie with intestinal infections in a children's EMS h and stressed the susceptibility of the infant, the rôle of the convalescent dysentery carrier, and the importance of respiratory infection as an ætiological factor in non-specific enteritis Dr Edmund Nobel mentioned the difficulties in preventing the spread of chicken-pox and measles even in an isolation block but emphasised the value of small glass cubicles as first used in Pirquet's clinic for nursing infants Dr R A O'Brien thought the ideal mask had yet to be devised, and Dr V D Allison suggested the use of a polyvalent streptococcal vaccine for the protection of probationer nurses in fever hospitals

---

A SYMPOSIUM ON CHEST WOUNDS

The staff of the chest centre, Merseyside Group, met on Feb 12 at the Liverpool Medical Institute to read and discuss the last of a series of short papers (see *Lancet*, Jan 31, p 148 and Feb 14, p 216) on war wounds of the chest

UNINFECTED HÆMOTHORAX

Mr H Morriston Davies, director of the centre, said that hæmothorax may complicate any chest injury, and occurs in varying degree in 70% of chest injuries in warfare In non-penetrating injuries it is usually the result of a splintered rib tearing the lung or an intercostal artery Whenever there is tear of the lung air may be found with the blood in the cavity Injuries which result in a hæmothorax may be fatal because of shock or associated damage to other organs, but hæmothorax itself causes death for three specific reasons loss of blood, compression of the lungs and main vessels, or sepsis supervening later The capacity of the pleural cavity is 5000–6000 c cm, but the loss of 1700 c cm of blood into the cavity is sufficient to cause unconsciousness and death This may happen when an intercostal artery is torn and there is direct communication with the pleural cavity, injury to the hilum vessels or vena cava, he said, are too immediately fatal for surgical aid *Bleeding from the lung* parenchyma is *rarely fatal per se*, because the pulmonary circulatory pressure is lower than that of the systemic circulation, and as the lung collapses the wound in it tends to become closed If, however, there is an added tear in a bronchus, and especially a valvular one, death may result from compression He emphasised the importance of taking repeated pulse-rate and pressure readings and of noting alterations in the position of the apex-beat Bleeding may recur after a patient has been moved, as a result of further injury by rib splinter, and a rise of blood pressure after anti-shock treatment may start a bleeding point oozing again

After 24 hours a hæmothorax often becomes complicated by effusion provoked by irritation of the mesothelium This will lead to more rapid compression of the lungs and large vessels and unless relieved will cause death Moreover, under tension such an effusion can cause a morning and evening rise of temperature accompanied by few constitutional symptoms The temperature drops on relief of tension In the absence of sepsis blood rarely clots in the pleural cavity, but the deposit of fibrin, blood and endothelial cells gradually becomes organised and encases the lungs, as can be seen on thoracoscopy

Treatment, he said, must aim at saving life and restoring function to as near normal as possible After anti-shock treatment, the surgeon must diagnose the source of the blood and assess the size of the hæmothorax and the extent of the associated injuries If the bleeding is from an intercostal artery, treatment is urgent but should be limited to what is necessary to stop bleeding Six measures are essential blood-transfusion, relief of intrapleural pressure (no attempt being made to wash out the blood), excision of the wound and of rib splinters, ligature of the bleeding artery, insufflation with sulphanilamide powder, and suture in one layer Not until the patient has recovered from the loss of blood should the complete irrigation toilet—as for a pulmonary hæmothorax—be done A hæmothorax which is not endangering life by its size should be completely washed out with saline 24–48 hours after onset, the saline then being replaced by air During this process the intrapleural pressure must be kept at a minimum negative level, a high negative may start bleeding gain, with further injury to the already damaged lung A compression hæmothorax with effusion or air must be relieved by aspiration and replacement as and when necessary Three factors interfere with re-expansion of the lung pneumonitis and subsequent interstitial fibrosis, deposits on the pleural membranes and organisation, and recurring (and untreated) effusions Remedial exercises are valuable

INFECTED HÆMOTHORAX

Mr J HOWELL HUGHES said that infection of hæmothorax influences the mortality-rate of wounds of the chest, the period of illness and the chances of restoring complete health The origin of the infection may be from the lung itself, the lung tissue being devitalised by damage from a foreign body or hæmorrhage, from the chest wall where excision of infected wounds has been too late or inadequate; from foreign bodies, from the blood-stream, as part of a generalised infection, or the result of carelessness with regard to asepsis during treatment The organisms may be staphylococci, streptococci, pneumococci or rarely anaerobic organisms Infection may supervene in a matter of hours or may be late—two or three weeks after primary trauma—but early diagnosis, he said, is of the utmost importance The clinical picture is by no means diagnostic, since the temperature may rise for 3–4 days with a simple hæmothorax, a rise in the pulse-rate is suspicious, and so is a leucocytosis, but the only positive method of arriving at a diagnosis is by aspiration of the pleural fluid, which when infected is often purplish and has an unpleasant or even offensive odour, micro-organisms are found in the direct smear. Treatment must be begun as soon as the presence of infection is established, and consists of evacuation of the fluid This is best done by repeated aspiration, the risk of infection of the chest wall can be lessened by cutting down to an intercostal space and packing the small wound with flavine gauze so as to get a track lined with granulation tissue along which the needle may be passed for each aspiration Continuous suction drainage through a so-called airtight tube, though theoretically ideal, is to be avoided, in practice there is usually an air leak into the pleural cavity which produces a total empyema Closing the skin tight around the tube is to be condemned because of the danger that superficial tissues will become infected His experiences of pleural lavage have been disappointing, and he finds there is a danger of fatal complications if a bronchopleural fistula develops Once the pus has become thick, open drainage should be instituted by resection of a rib, the site of resection depending on the position of the cavity A drainage-tube can be inserted or a portion of two or three ribs can be removed and the cavity packed with gauze impregnated with eusol or azochloramid Suction through the tube does not appear to have much effect on the rate of closure of the cavity Exercises of the McMahon type, however, are of great value, he finds, and should be begun as soon as the general condition allows The opening in the chest wall is not allowed to close until complete obliteration of the empyema cavity has been confirmed by radiography with 'Lipiodol' or 'Neo-Hydriol' In cases where the empyema becomes chronic his most satisfactory results have been obtained with the Schede type of operation, carried out in stages if the cavity is extensive

HOSPITAL PROBLEMS IN EIRE

THE late appearance of the fourth general report of the Hospitals Commission has given rise to comment and is difficult to explain The commission advises the minister for local government and public health on the distribution of sweepstake funds The report, which furnishes statistical data for 1937 and 1938, was presented to the minister in July, 1939, bears the date 1940, and is published in January, 1912 Many of the contents have suffered from this prolonged cold storage For instance the commission draws attention to the growing size of hospital deficits, pointing out that unless they are controlled some of the schemes for the development of the hospitals must be abandoned At the moment it is hopeless to consider the problem of deficits, however appropriate it may have been in 1938 As in earlier reports, the commission stresses the discrepancy between the numbers of available beds in the voluntary hospitals and the numbers in fact occupied The inconsistency is more apparent than real and is largely due to the necessity of giving the wards an annual spring-clean, and of providing an adequate holiday for the nursing staff During the months when all the wards are open nearly all the beds are occupied

There is no doubt that in this respect the Irish voluntary hospitals are behind those of other countries in the keeping of accounts and records and the commission once more stresses the need for greater cooperation between the hospitals and points out the benefits that have followed in other countries on the establishment of hospital associations It is several years since the voluntary hospitals of Ireland tried to establish such an association of this kind It was, however, killed at once by the refusal of the minister for local government and public health to permit the rate-supported institutions to become members

The Medical Research Council of Ireland and the Hospital Library Council, both of which were established with the help of money from the sweepstakes, continue to do useful work As a supplement the commission prints a careful statistical report, giving particulars of the sickness experience of the *National Health Insurance Society* during 1935–36 The society has about 500,000 members, almost a sixth of the entire population of the country According to the claims for sickness and disablement benefits the greatest cause of incapacity is rheumatism, which in 1935 caused 295,000 weeks of illness, and in 1936 286,000 weeks Next to rheumatism came respiratory diseases, not including tuberculosis, then in order nervous and mental disorders, heart disease, tuberculosis, and blood diseases Careful consideration has been given to the geographic and occupational distribution of illness

TO PREPARE VEGETABLES FOR THE TABLE

LAST year the Medical Research Council summarised our knowledge of the behaviour of vitamins in greenstuffs,[1] and the Board of Education has now supplemented this with some notes on the preparation and cooking of vegetables The chief aim is to conserve vitamins B and C which are likely to be lost since they dissolve out while soaking and in cooking water, and also run out in the watery juice The following practical rules are suggested

Use vegetables as fresh as possible, keep in damp cool place, avoid damage by crushing and bruising

Vegetables should be prepared immediately before cooking Soaking overnight is highly undesirable and should be avoided If vegetables have to be soaked for any length of time, salt (4 tablespoons to the gallon) must always be added to the water

Outer leaves contain most vitamins and should not be thrown away, they will, however, take longer to cook and should be started first

Shred green vegetables and slice root vegetables Plunge all vegetables, green, root and potatoes, into rapidly boiling water, or root or potatoes into heated steamers Add gradually in order to prevent water going off the boil Have boilers not more than a third full of water Add salt to the water before adding vegetables (4 tablespoons to the gallon) Put on lid and cook rapidly for no longer than is necessary to render them tender

Cook vegetables in relays throughout serving period using the same water for successive batches, adding more water only if necessary If water is left after cooking use for soups, stews and gravies

Serve vegetables immediately after cooking and on no account allow to stand for a long time on a hot plate In central kitchens fill and cover containers immediately after cooking, do not heat again before serving

In hay box cooking vitamin C is destroyed so that this method should not be used for cooking green vegetables Steaming of vegetables even with the best equipment is not as satisfactory as cooking in water as described above The use of bicarbonate of soda is not recommended, but it may be used when cooking separately tough outer leaves which would otherwise be thrown away

If these precautions are taken, the valuable salts and vitamins present in green vegetables will be effectively conserved

---

[1] *Lancet* 1941 i, 838

In England Now

A Running Commentary by Peripatetic Correspondents

I CAN'T imagine why no enterprising manufacturer of electrical equipment has produced a gadget for starting one's car off the main these cold mornings A motor magnate of my acquaintance says there isn't any demand for it, and probably there never would be among motor magnates, but we small-mileage motorists would demand it all right if there was such a thing It would not do, I imagine, to take the full voltage of the main into the car, so one would want a twelve-volt transformer on the garage wall, with a length of flex to plug in to a socket connected with the starter. Then think of the delight of hearing the familiar whurr-whurr without that sinking of the heart in anticipation of the battery running down The thing should not cost much more than the price of one recharging of the battery with hire of the garage car for a day The car of the future will have its socket on the dash for the main, with a switch marked "Mains Starter" and "Immersion Heaters," for once one has the current there it would be a pity not to go the whole hog and keep one's radiator and sump up to something near boiling point, so that one could start out in the morning with a full battery and a hot engine, thus saving the pints of petrol now wasted in bringing the engine up to an efficient temperature

* * *

The news from the East has seriously disturbed my confidence in Kipling's accuracy. The mention of Moulmein gave me a thrill, but when I looked at the little map in my daily paper I could not make out how, if the British soldier met his "neater sweeter" Burma girl near the old Moulmein pagoda, the dawn could have come up like thunder 'crost the bay because they must have been looking west The only explanation I can give is that she was paying a visit to an aunt in Rangoon, unless in that city there is a pagoda named after the town on the other side of the Gulf of Martaban I have learnt for the first time that Mandalay is some 400 miles inland up the river Sittang, but this provides another puzzle Are there flying fishes in the river? I always thought they were sea-water fish, and imagined the road from Rangoon to Mandalay, where the two sat watching strangers and elephants running, to be somewhere along a sea-shore Perhaps the word "creek" explains it—some "sludgy squdgy" place, half sea, half river, with the flying fishes leaping from the bows of the ships as I have seen them in the open sea as we entered Bilbao The other geographical difficulty is how China comes into the picture But that we can attribute to the British soldier He is not going to worry whether it was China or Siam, so long as he can bring to mind the picture that 'er petticoat was yaller and 'er little cap was green and feel her arm upon his shoulder where the silence 'ung that 'eavy you was 'arf afraid to speak as they sat cheek to cheek—a pose be it noted that it did not need the present generation to discover

* * *

I was pleased at Desmond MacCarthy's recent denunciation of the habit of referring to things or public bodies, institutions or offices by the initials of their titles It is a reprehensible habit to which we doctors are all too prone, and it was a lovely example of "rough justice" that the distinguished literary critic's denunciation should have coincided so exactly with one of the worst examples of this decadent habit ever perpetrated —and, of all places, in the *Lancet* I was shocked quite sufficiently the first time I heard the Royal Society of Medicine referred to as the "R S M," but to find this distinguished society masquerading under the inhuman, horrid, impersonal monomark of "RSM," as it did in the leading article on p 144 of Jan 31, is too hideous to be true Considerations of space, so eloquently stressed in the patriotic appeals for scrap paper which have recently appeared among the annotations, might possibly excuse the abbreviation "R S M," though even this I am not prepared to concede, but to omit the full stops is unpardonable It sounds too much like a cross between some mathematical formula and a hideous Wellsian nightmare Soon we shall see the following account of the proceedings of the Comitia of the Royal College of Physicians

A Com of the RCP was held on Feb 1 The Pres, Sir CW, called on Dr RH, the Asst Registrar, deputising for Dr HLT, to read the rept of the Jt Com of the RCP, RCS BMA and UL Prof JR moved the reference of this rep to a sub com, a motion seconded by Sir AB The following Censors were apptd—Drs JP, TIB, KH and JCB

Some abreviations, such as those used in prescriptions—t d s, p r n, I V—are probably sufficiently well established to justify their retention, but, while it may be difficult to say where the line should be drawn, unless we do something about it the King's English will degenerate into shorthand Some abbreviations already in use, such as P R, which stands for both per rectum and pulse-rate, are ambiguous, others, particularly the designation of diseases by their initials, are positively dangerous, C T to the neurologist means cerebral tumour, to the cardiologist it stands for coronary thrombosis, G U to the general physician means gastric ulcer, to the urologist it represents the genito urinary tract *The arch-criminals in this line of country* are the gynæcologists I writhe with æsthetic anguish every time one of my patients returns from my gynæcological colleagues with the diagnosis of E U A On the other hand I get some sadistic pleasure from the knowledge that even the most inveterate users of initials are often ignorant of their correct translation P U O, for instance, is almost always taken to mean pyrexia of unknown origin In fact, this is a W O (War Office) abbreviation, and, as the W.O will never admit officially that anything is unknown to them, P U O = pyrexia of unascertained origin No student, and comparatively few teachers, know the correct usage of N A D (nil abnormal detected) as opposed to N A C (no abnormal constituents) No exception can be taken to the use of initials in the presence of patients as synonyms to disguise unpleasant diagnoses Obvious examples of these are G C for gonorrhœa, V D for venereal disease, P T for pulmonary tuberculosis, and C S M for cerebrospinal meningitis But even here other synonyms are safer, such as Neisserian infection for gonorrhœa, and Koch's infection for tuberculosis But why continue? The *Lancet* has tolled the knell of parting literary standards In alliance with G B S, we shall now witness a frontal attack on the glories of English as she *was written by* Charles Lamb, Macaulay and Matthew Arnold and its conquest by the "simplified English," which so appeals to the greatest of our living dramatists

* * *

The discussion in the *Times* about rebuilding the City may have been a premature delivery but the suggestions of the Provost of Eton had a lithopædion flavour Just fancy his memorial arch at the bottom of Ludgate Hill What an excellent target for enthusiastic medical students to climb, hang banners from, even decorate with those pieces of sanitary earthenware which an elderly peripatetic correspondent says he can find no longer under the beds of the houses at which he stays I have a longing that some of the open spaces, left when the demolition squads have razed gutted buildings, shall remain and be covered by grass kept in that perfect order which is achieved when the Office of Works takes over ancient abbeys As one imagines the monks treading the erstwhile corridors, so our grandchildren and descendants would imagine the plutocrat of London Wall waddling to his chop-house And the concreted shells of famous warehouse basements now filled with deep water for fire-fighting could be a nucleus of a system of pleasant watercourses down which the sedentary workers could punt their best girls during dinner hours in summer, or along which they would skate in winter I am not surprised that green belts are so little sought after when the city worker knows so little of their pleasure In summer the solicitors' clerks (or other people, probably not F R C S 's) revel in the green of Lincoln's Inn Fields Why cannot opportunities be made for others in the City? Why should the city clerk be condemned to underground dens for lunch, when in summer he might seek pastures new, and in winter skate his way along to some super-cafeteria, where queueing is no more and stockbrokers are at rest

From the medical student's point of view the chances in rebuilt London are legion The medicos in their "digs" at Putney will board their barge (why shouldn't all the hospitals have barges like colleges do at Oxford, nly peripatetic ones ?) and make their way down stream istening to the morbid anatomist giving his lecture on he river instead of in the theatre at 9 15 A M As a tudent I disliked 9 15 lectures, as a chief I positively omit at the thought of them Thomas's and Westminster men will leave at Lambeth Bridge, Charing ross at Hungerford, Bart's at Blackfriars, Guy's at London Bridge and the Londoners at Wapping Quay How much more satisfactory than the crowded tubes There will have to be an offshoot of the Regent's Canal for Mary's men, and for the Middlesex and U C H George's new buildings will be planned in relation to the barges, and if King's don't like it they will have to move Small cubicles could be booked for crammers, and suitable refreshment served How much more satisfactory than the crowded mess-rooms of our present colleges There could indeed be a midder barge with museum specimens, pelves of all dimensions, and amniotic fluid in abundance, a surgical barge with similar specimens and so on It would be better than trying to study a Lewis's library book standing between two shop assistants from Gamage's, a stockbroker's clerk and a city typist The revision viva voce courses could all take place in friendly inter-hospital rivalry Incidentally, this might be a step towards United Hospital playing fields, thus saving those journeys to Chislehurst, Wembley, Hale End and Honor Oak It might, of course, mean that Harley Street would have to move But fifty years ago consultants lived in Finsbury Square, and to keep Harley Street on the hop would certainly be a tenet of those organising state medicine

* * *

With his talks on U S, U S S R, and US, Sir Stafford Cripps reminds me of the afternoon I saw the clean pigs Like all the best peripatetic correspondents, I dote on animals, and the pigs looked splendid in their well-appointed suites As usual, however, I was chiefly thinking about my tea, and I was unfeignedly thankful when the chairman of the collective farm invited us all —the two French, the three Americans, the interpreter, and me—to his wooden home His small daughter, radiant on a new birthday bicycle awarded for her father's social merit, led a foraging expedition to the village; and within the hour we were enjoying fish and sausages and cheese and wine, transmuted by Russian friendliness into an international feast When this was over we drank solemnly to the memory of Lenin, and devotedly to Comrade Stalin, then to the French Republic, and then to the United States I waited bashfully for the coming toast to Great Britain But it never came, and I suddenly remembered that our Empire is a monarchical tyranny where man-eating plutocrats exploit workers of all colours and ages

I said to myself that, if they only knew, the builders of the new Russia would find more to please them in England than in the States And I now feel sure that when America, Britain and the Soviet Union take the world in hand we shall be needed as a link between the two very different societies east and west

Are we not indeed a natural meeting-place for ideas and people from anywhere and everywhere? In a country cherishing so many incongruous institutions—feudal, socialist, theocratic, capitalist, communist, imperialist, altruistic, and merely fantastic—even the Man in the Moon could find reason to feel politically at home

* * *

Years ago at the Ring, Blackfriars, I watched a little man with a moustache and a bowler hat at the back of the arena, who ever and anon indignantly sought to stimulate a boxer by rising to his feet and shouting, "Cow erd, cow-erd" It was the criticisms of the Government's conduct of the war by Messrs Hore-Belisha and Shinwell that reminded me of this incident At the end of our lane is a big country house crowded with soldiers I happen to know that although they could easily do so they don't take a newspaper, nor have they a wireless, but they seem perfectly happy I feel that these not unrelated phenomena could be expressed by one of those pithy laws on the expansion of gases and like subjects which we used to read in the physics books When a nation goes to war the individual energy so liberated can be expressed by service (S), by stimulation to service (C), or by a combination of both, in which case the intensity and quantity of C varies inversely with the intensity and quantity of S

Letters to the Editor

ZIPP

SIR,—I have now treated 313 wounds of various kinds with zipp, a paste similar to bipp but with zinc oxide taking the place of bismuth and now included in the BPC formulary as zinc and iodoform paste The wounds included 55 open fractures, of which 46 have now united in an average period of 60 days. I have had no cases of gas gangrene, iodoform poisoning, dermatitis or maggot infestation and there has been no repulsive stench

I am very anxious that the claims of iodoform pastes, which have over and over again proved their worth under very difficult conditions and in the hands of the most competent observers (e g, Rutherford Morison, Treves, Macewen, Gordon Watson, A K. Henry, J. H Saint), should not be overlooked in the present war Had it no other virtues, the mere fact that zipp is sterile (although unsterilised) makes it much more useful than 'Vaseline' under conditions of active warfare Sterile vaseline in sufficient quantities is often unavailable when most wanted to meet a sudden large inrush of wounded I make no claim that zipp represents the ideal iodoform paste, but merely that certain qualities which it possesses allow it to be used exactly as sterile vaseline is used in the orthodox Winnett Orr technique, whereas bipp, on account of its toxicity, can be used only as a thin smear or pellicle in wounds The question of incorporating sulphanilamide in an iodoform paste (as in Hoffmann's zisp) calls for consideration, but my own belief is that the economical method of exhibiting modern chemotherapeutic drugs—by mouth—will prove to be more efficient than any kind of sulphanilamide pack Since sulphanilamide has a powerful but transient antiseptic action in wounds, it does not really compete with the iodoform pastes which have a much weaker but sustained action

A new zipp which I made and in which zinc peroxide was made to replace zinc oxide was found to liberate free iodine when incubated in the dark at 37° C Nevertheless, it was *not nearly so satisfactory* in practice as the original zipp, and I have given it up

I feel convinced that the modern tendency to abandon the intelligent use of antiseptics (except the sulphanilamide group, which has almost hypnotised the therapeutic imagination), and to rely for wound healing and disinfection entirely on the defensive and reparative processes of unaided nature, is unscientific and represents an uncritical overswing of the surgical pendulum

Nairobi, Kenya Colony W V CONNELL

MASS RADIOSCOPY IN FACTORIES

SIR,—Dr Philip Ellman sees in the article of Dr Stephen-Hall a matter for congratulation and he would apparently encourage others to adopt this in similar circumstances as "the method of choice" Is he aware of the dangers to which such investigators are subjected? Using a unit which most experienced radiologists and probably the National Physical Laboratory would regard as inadequately protected for such examinations, Dr Hall held sessions of 2½ hours each at which he submitted each of 795 workpeople in one factory to a radioscopic examination occupying rather less than a minute Has he any idea how long this can be kept up? Personally I regard it as a very dangerous proceeding which should be prohibited Dr Hall states that at his consulting-room "my practice is to conduct my examination almost entirely by radioscopy," which apparently he finds as satisfactory as his radiography I have demonstrated on many occasions that the direct radiogram will reveal lesions which the screen failed to indicate and now do not believe it is wise to rely entirely on the screen examination The superiority of the direct film over the miniature photograph of the screen image has been proved by all workers Yet Dr Ellman and his co-workers advise that the more accurate direct radiographic examination should be dependent upon the detection of positive findings at a mass examination I would certainly not agree to accept the opinion that all the negative miniatures would prove negative to direct radiography Neither would I accept the opinion that all with negative direct radiograms were free from tuberculosis

What was accomplished with this survey to warrant its repetition? Of 795 workpeople examined it was found that "2 of them were known established cases of phthisis and 1 other was found to have active disease" These 2 known cases were allowed to work in the factory—there is no legislation to stop them though they may be *potential sources of infection* *Unless you can* adequately provide for them and for any others he may detect it is surely unjustifiable to add to their burden, to emblazon their disability before their employers and fellow workers He has no right to assume that the workpeople have no idea of the nature of the disease he seeks He admits that "The limitations of this method of survey were impressed upon me three weeks later when one of the girls whom I had examined at the factory and declared to be free from tuberculosis was admitted to my ward with a large tuberculous peritoneal effusion"

Dr Ellman says, "From my experience there is little doubt that it is an inexpensive method of detecting macroscopic lung lesions" I suggest that the method has not been used for sufficient time for anyone to estimate the cost in personnel I should expect it to be very high

Edgbaston, Birmingham JAMES F BRAILSFORD

SIR,—As far as I know Pilkington Brothers Ltd were the first industry in this country to use miniature screen photography as part of the routine examination of employees Up to date 1500 examinations have been made and the results are now being examined with a view to publication later Judging from answers to questions in Parliament and comments elsewhere, one of the factors that seems to prevent a more widespread use of this method is lack of suitable apparatus Through the kind cooperation of the borough medical officer of health (Dr F Hauxwell) and the borough health committee we were assisted in establishing the miniature radiography plant in our works surgery by the tuberculosis officer, Dr W Griffel

We already had a Victor Snook 'Senior' X ray plant equipped with a duo focus 2/10 kV oil immersed tube To this was added—as suggested by Dormer and Collender in the *Lancet* (1939, i, 1309)—a lead-covered light proof cone fitted with a Levy West screen at the wide end and an aperture for the camera lens at the other The camera, which is a simple box with a sprocket arrangement for film transport, is fitted with a 'Xenon' f 1 5 lens The cone is supported on a tubular steel frame which is permanently fixed to the concrete floor Between the tube stand and the cone is a small platform, worked hydraulically, which enables one with ease to adjust the position of the patient relative to the tube and cone This does away with the need for the complicated arrangement that would be necessary for the simultaneous movement of tube and cone For identification the patient's name, clock number, and the date are photographed on each film at the same time This is done by printing the name, &c in Indian ink on a strip of old film and inserting it by means of a metal slide in front of the screen in the left upper corner above the patient's left shoulder The names are also recorded in a book in the exact order of examinations as a further check The film used is one specially prepared by Kodak Ltd for this purpose and is known as 'Flurodak' For this type of work it is definitely faster than the fastest panchromatic film The exposure times vary, in our series, from 1/5 to 3/10 sec at 85 kVp and 150 mA at a focal spot screen distance of 36 in

The film strips are viewed by projecting them on a screen consisting of a sheet of 'Kodaloid' (obscured celluloid sheet) placed between two sheets of plate glass measuring 8 × 8 in Very fine grain is obtained on this type of screen and the reflection—so tiring in viewing—is largely reduced A resistance is fitted to the projector lamp and the light varied according to the density of the film No definite diagnosis is made on the film alone, any abnormality detected is taken as an indication that a large radiogram and further clinical investigation are needed In our scheme the films are viewed by Dr Griffel who has great experience of this method

Dr Ellman raises—as did Dr Morgan in an earlier issue (*Lancet*, 1940, ii, 246)—the point of victimisation of the worker It has been the accepted practice here that the results of any examination of the "welfare type" as opposed to the "compensation type" should be confidential, and not disclosed to the manage without the worker's consent This I regard essential to the success of any works medical we scheme If a pathological condition is discovered patient's own doctor receives a report and he gene follows it up by arranging any further investigation t is necessary Any advice as to change of occupat or the giving up of work would have to come from *and not from the works medical officer*

There is, however, one type of case on which I sho like guidance—namely, that of the comparativ healthy chronic carrier He may be working in a of the factory where the risk of infecting fellow-wor is great If the works medical officer arranges transfer would this be "victimisation"? My own vie at present is that to allow a sprayer of tubercle bacilli t remain amongst adolescents and young adults would to make them the subject of a far worse form of victim isation But how to solve this problem without breach of confidence is beyond me

R MORRIS JONES

CLINICAL TEACHING

SIR,—I submit that the time has come when medica studies in London should be reorganised It is we known that the student learns most from the medica and surgical registrars of his hospital These young con sultants are rapidly being absorbed into the fighting services The duties of class 2 officers of the EMS are not onerous I suggest that all of them shall be called on to take a share in teaching students The clinical material in the LCC hospitals and so-called non teaching voluntary hospitals must be made available for this purpose A greater concentration of effort is to be made by us all at the present time May I plead that the medical student shall be equipped with the same standard of knowledge as was given him in peace-time?

Brook Street, W 1 CLIFFORD MORSON

RECURRENT NEUTROPHIL AGRANULOCYTOSIS

SIR,—I was greatly interested in the case described in your issue of Jan 24 by Dr Barsby and Dr Close of the woman of 41 with attacks of pyrexia associated with neutrophil agranulocytosis This case calls to mind a child of about 5 years that we had in the children's ward at Guy's, I think in about 1927 This child had similar attacks of pyrexia, occurring about once a month, each attack being accompanied by a more or less complete absence of polymorph cells from the circulation As in the case cited by your correspondents, it was possible to foretell an attack by the diminution in numbers of these cells During an attack, we used to give her a substan tial transfusion which seemed beneficial, but after some months she was taken home, where she shortly developed bronchopneumonia and died There was no post-mortem examination No doubt it would be possible to find particulars of the case in the hospital records

Hayward's Heath J W SHACKLE

DOSAGE OF INSULIN

SIR,—In THE LANCET of Feb 21 (p 238) you report a death due to an overdose of insulin In view of the chaotic state of insulin labelling I am surprised that more deaths do not occur A strong protest from members of the medical profession is long overdue One of my duties is the supervision of a clinic for diabetics and a good deal of my time is spent in explaining the intricacies of "double strength" insulin to my patients Some of them have insulin syringes marked in units (1 c cm = 20 units), others have ordinary syringes marked in decimals of 1 c cm up to 1 c cm and also in minims up to 20 minims They often take this latter reading to indi cate insulin units until shown otherwise The whole position could be simplified by having a standard insulin syringe engraved in, say, red, white and blue The red graduations could be for "quadruple strength" insulin (80 units per 1 c cm), the blue for "double strength" (40 units per 1 c cm), and the white for single strength If at the same time all insulin were supplied in bottles whose labels were coloured in the same way as the syringe graduations to indicate the strength of the contents, the liability to error would be much reduced Perhaps there re other and more practical suggestions In any case omething ought to be done about it

W. W. WALTHER

Queen Mary's Hospital for the East End

STIGMA

SIR,—You remarked in a leading article (Feb 7, p 174) n the demise of "Colney Hatch" as a place name A ame well known in the United States disappears by the mission of "Bloomingdale" from the title of what is ow to be called the Westchester Division of the New ork Hospital This change was necessary because as he name of an asylum for the insane it had become the pecial target for the obloquy still cast upon our fellows who suffer from a particular kind of illness That such change should be necessary is regrettable, for the name of this justly famed hospital had come to serve as an instrument of ignorance and superstition not only in popular speech but on the vaudeville stage and in the press, so that it was difficult for a family to accept the idea of one of its members going to Bloomingdale Similar conditions have arisen in this country and have been similarly met, though for obvious reasons no protest could be publicly made on the occasion of so shameful a necessity Popular speech is difficult to influence, but it ought to be possible to ensure that a protest should be conveyed to those concerned whenever in print or on the stage this ugly tendency shows itself either in respect to an institution or to the affliction of insanity itself Perhaps one of our societies interested in mental welfare might persuade its members to do this watch-dog duty

ARGUS

SULPHONAMIDES AND ENTERIC FEVERS

SIR,—During the 1941 epidemic of paratyphoid in Bristol sulphapyridine was given to a number of patients, but the results were such that it was soon stopped They felt much worse headaches became more severe, nausea and vomiting increased and the diarrhœa and toxæmia continued unabated Dr. Russell's letter prompts me to describe briefly a case in which sulphapyridine was administered for another condition and paratyphoid developed while under treatment

On the sixth day of illness a girl aged 14 months was admitted to hospital with meningitis Culture proved the infecting organism to be *Hæmophilus influenzæ* (confirmed independently in two laboratories) and 3 g of sulphapyridine was given daily for 9 days After initial improvement her condition deteriorated and on the 20th, 21st and 22nd days of illness she again received 3 g of sulphapyridine, or a total of 36 g during the 16 days in hospital The child developed diarrhœa and from the stools *Bact paratyphosum B* was isolated *Sulphathiazole* was now started in daily doses of 4 5 g After 31 g had been given the cerebrospinal fluid was sterile and the meningitis had cleared up Despite these large doses however, the paratyphoid was unaffected and the child died from the infection on the 32nd day of illness No autopsy was made

Clearly in this patient sulphapyridine failed to prevent the onset of the paratyphoid infection and the sulphathiazole failed to alter the course of the disease This is entirely in accord with previous experience that sulphonamides have no favourable action in paratyphoid

Bristol J N P DAVIES

THE FUTURE STAFFING OF HOSPITALS

SIR,—Plato, visualising the ideal state, looked forward to the day when all kings would be philosophers or all philosophers kings In the much-discussed postwar reconstructed state of ours Dr Alcock appears to look forward to the day when all GPs will be specialists or all specialists GPs In a truly democratic state there is a rightful place for every one of its members; and the individual should be judged not on his position but on the usefulness of his function towards the common weal No-one is denying the usefulness of the GP, similarly the specialist should not be denied his position From his letter of Feb 21 Dr Alcock seems to gauge the usefulness of the hospital specialist on the percentage of men returned fit for the Services, which he goes on to say is far less than the specialist imagines Is he then insinuat- al run by GPs (who are already supposed to be much overworked) would make a better job of it, and turn out a higher percentage of cures of duodenal ulcers, diabetes and tuberculosis? Dr Alcock says that *the GP must be the prime consideration* of the nation Judging, however from his proposed oligarchy of GPs running the hospitals we suspect that what he really means is that the nation should become the prime, and almost exclusive, consideration of the GP

In the brave new world there will be a place in the sun for us all—the hospital specialist the GP, and even the patient—and *until we see the victorious conclusion of* this war, and the return to civil life of our colleagues now in the Services, who will then be able to take their rightful place at the treaty table in helping to work out a more satisfactory solution than that so didactically stated by Dr Alcock, we advise him to content himself with the words.

> "Better it is to be of an humble spirit with the lowly, than to divide the spoil with the proud"

RICHARD ROE and others

ASSOCIATION OF AUSTRIAN DOCTORS IN GREAT BRITAIN

SIR,—It might be of interest to your readers to hear of the setting up of an association of Austrian doctors in Great Britain under the chairmanship of Prof F. Silberstein late of Vienna University We want to continue the noble traditions of the Vienna medical school in the spirit of scientific progress of Pirquet, Wenckebach Chvostek and Landsteiner Our association affiliated to the Free Austrian movement aims to make all our colleagues participate in the war effort of Great Britain and her Allies, and at such places as their skill is most needed We endeavour to collaborate with all medical organisations and with individual representatives of British medicine For obvious reasons we Austrians, the first victims of Nazi oppression are willing to do our utmost to help the Allied cause More than half of the 360 Austrian doctors in this country are already engaged in work of national importance, in hospitals and other institutions all over the country: but about 160 are not yet participating in the war effort Prof Samson Wright Prof S P Bedson among others, have expressed their readiness to help us Any suggestions from your readers will be welcome We are holding meetings periodically where we hope to welcome British friends

A. HAMMERMANN,
Hon Secretary

Eastern Hospital, E 9

STUDENTS IN UNIFORM?

SIR,—As a student, I think your peripatetic correspondent and your leader were both too kind to us Whether we wore uniform at times or all the time, we should still have made the decision not to risk our lives at this particular moment, and in making the decision we certainly are not at this moment, serving our country We hope to be able to serve it when we are qualified, but if the war ends it will be a safe and rather well-rewarded sort of service Your leader remarked that there are no cushy jobs for students today, but there are—I have one I work fairly hard and the Home Guard has not proved "impracticable" so far although promotion in the Home Guard is apt to be a bit of a disaster, but I live in security, and I have time to go out to dinner and see films My non-medical friends were going to be architects schoolmasters, parsons, and some of them still may be, but over a third are dead Under circumstances like these it seems absurd to attempt to allay our unrest with uniforms and encouraging words The plain fact is that we preferred medicine and the possibility of future usefulness to immediate service and battle It surely does not hurt us to realise that even in the eyes of those who like us, we cannot expect honour until we have done something to deserve it

STUDENT

At the annual meeting of the Central Council for District Nursing in London it was reported that during the year 1940–41 over 3400 patients were treated and 92 048 visits made Over 84 000 "insulin" visits were also paid The LCC makes an annual block grant of £4400 for this work to the district nursing associations all with negative direct radiograms were free from tuberculosis.

What was accomplished with this survey to warrant its repetition? Of 795 workpeople examined it was found that "2 of them were known established cases of phthisis and 1 other was found to have active disease." These 2 known cases were allowed to work in the factory—there is no legislation to stop them though they may be potential sources of infection. Unless you can adequately provide for them and for any others he may detect it is surely unjustifiable to add to their burden, to emblazon their disability before their employers and fellow workers. He has no right to assume that the workpeople have no idea of the nature of the disease he seeks. He admits that "The limitations of this method of survey were impressed upon me three weeks later when one of the girls whom I had examined at the factory and declared to be free from tuberculosis was admitted to my ward with a large tuberculous peritoneal effusion."

Dr Ellman says, "From my experience there is little doubt that it is an inexpensive method of detecting macroscopic lung lesions." I suggest that the method has not been used for sufficient time for anyone to estimate the cost in personnel. I should expect it to be very high.

Edgbaston, Birmingham. JAMES F BRAILSFORD

SIR,—As far as I know Pilkington Brothers Ltd were the first industry in this country to use miniature screen photography as part of the routine examination of employees. Up to date 1500 examinations have been made and the results are now being examined with a view to publication later. Judging from answers to questions in Parliament and comments elsewhere, one of the factors that seems to prevent a more widespread use of this method is lack of suitable apparatus. Through the kind cooperation of the borough medical officer of health (Dr F Hauxwell) and the borough health committee we were assisted in establishing the miniature radiography plant in our works surgery by the tuberculosis officer, Dr W Griffel.

We already had a Victor Snook 'Senior' X ray plant equipped with a duo-focus 2/10 kV oil-immersed tube. To this was added—as suggested by Dormer and Collender in the *Lancet* (1939, i, 1309)—a lead covered light proof cone fitted with a Levy-West screen at the wide end and an aperture for the camera lens at the other. The camera, which is a simple box with a sprocket arrangement for film transport, is fitted with a 'Xenon' f 1 5 lens. The cone is supported on a tubular steel frame which is permanently fixed to the concrete floor. Between the tube stand and the cone is a small platform, worked hydraulically, which enables one with ease to adjust the position of the patient relative to the tube and cone. This does away with the need for the complicated arrangement that would be necessary for the simultaneous movement of tube and cone. For identification the patient's name, clock number, and the date are photographed on each film at the same time. This is done by printing the name, &c in Indian ink on a strip of old film and inserting it by means of a metal slide in front of the screen in the left upper corner above the patient's left shoulder. The names are also recorded in a book in the exact order of examinations as a further check. The film used is one specially prepared by Kodak Ltd for this purpose and is known as 'Flurodak.' For this type of work it is definitely faster than the fastest panchromatic film. The exposure times vary, in our series, from 1/5 to 3/10 sec at 85 kVp and 150 mA at a focal spot screen distance of 36 in.

The film strips are viewed by projecting them on a screen consisting of a sheet of 'Kodaloid' (obscured celluloid sheet) placed between two sheets of plate glass measuring 8 × 8 in. Very fine grain is obtained on this type of screen and the reflection—so tiring in viewing—is largely reduced. A resistance is fitted to the projector lamp and the light varied according to the density of the film. No definite diagnosis is made on the film alone; any abnormality detected is taken as an indication that a large radiogram and further clinical investigation are needed. In our scheme the films are viewed by Dr Griffel who has great experience of this method.

Dr Ellman raises—as did Dr Morgan in an earlier issue (*Lancet*, 1940, ii, 246)—the point of victimisation of the worker. It has been the accepted practice here that the results of any examination of the "welfare type" as opposed to the "compensation type" should be confidential, and not disclosed to the manage without the worker's consent. This I regard essential to the success of any works medical we scheme. If a pathological condition is discovered t patient's own doctor receives a report and he generally follows it up by arranging any further investigation that is necessary. Any advice as to change of occupation or the giving up of work would have to come from him and not from the works medical officer.

There is, however, one type of case on which I should like guidance—namely, that of the comparatively healthy chronic carrier. He may be working in a part of the factory where the risk of infecting fellow-workers is great. If the works medical officer arranges his transfer would this be "victimisation"? My own view at present is that to allow a sprayer of tubercle bacilli to remain amongst adolescents and young adults would be to make them the subject of a far worse form of victimisation. But how to solve this problem without a breach of confidence is beyond me.

R MORRIS JONES

CLINICAL TEACHING

SIR,—I submit that the time has come when medical studies in London should be reorganised. It is well known that the student learns most from the medical and surgical registrars of his hospital. These young consultants are rapidly being absorbed into the fighting services. The duties of class 2 officers of the EMS are not onerous. I suggest that all of them shall be called on to take a share in teaching students. The clinical material in the LCC hospitals and so-called non-teaching voluntary hospitals must be made available for this purpose. A greater concentration of effort is to be made by us all at the present time. May I plead that the medical student shall be equipped with the same standard of knowledge as was given him in peace-time?

Brook Street, W 1. CLIFFORD MORSON

RECURRENT NEUTROPHIL AGRANULOCYTOSIS

SIR,—I was greatly interested in the case described in your issue of Jan 24 by Dr Barsby and Dr Close of the woman of 41 with attacks of pyrexia associated with neutrophil agranulocytosis. This case calls to mind a child of about 5 years that we had in the children's ward at Guy's, I think in about 1927. This child had similar attacks of pyrexia, occurring about once a month, each attack being accompanied by a more or less complete absence of polymorph cells from the circulation. As in the case cited by your correspondents, it was possible to foretell an attack by the diminution in numbers of these cells. During an attack, we used to give her a substantial transfusion which seemed beneficial, but after some months she was taken home, where she shortly developed bronchopneumonia and died. There was no post-mortem examination. No doubt it would be possible to find particulars of the case in the hospital records.

Hayward's Heath. J W SHACKLE

DOSAGE OF INSULIN

SIR,—In THE LANCET of Feb 21 (p 238) you report a death due to an overdose of insulin. In view of the chaotic state of insulin labelling I am surprised that more deaths do not occur. A strong protest from members of the medical profession is long overdue. One of my duties is the supervision of a clinic for diabetics and a good deal of my time is spent in explaining the intricacies of "double strength" insulin to my patients. Some of them have insulin syringes marked in units (1 c cm = 20 units) others have ordinary syringes marked in decimals of 1 c cm up to 1 c cm and also in minims up to 20 minims. They often take this latter reading to indicate insulin units until shown otherwise. The whole position could be simplified by having a standard insulin syringe engraved in, say, red, white and blue. The red graduations could be for "quadruple strength" insulin (80 units per 1 c cm), the blue for "double strength" (40 units per 1 c cm), and the white for single strength. If at the same time all insulin were supplied in bottles whose labels were coloured in the same way as the syringe graduations to indicate the strength of the contents, the liability to error would be much reduced. Perhaps there

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS, M P

THE House of Commons is becoming progressively more and more realistic When we met last week for the debate on the war situation the effects of the previous criticisms had been manifest in large-scale ministerial changes The addition of Sir Stafford Cripps to the Cabinet with the office of Leader of the House was welcomed on all sides and most welcomed perhaps by the Prime Minister himself Mr Churchill has felt the strain of leading the House, in addition to all his other duties, and told the House so on a recent occasion Sir Stafford has demonstrated to the nation by his broadcasts on the Soviet Union how realistic his attitude is, and his answers in the House have given further proof of this quality Among many speeches, that of Prof A V Hill, F R S, put the point of view of the scientific mind with force and lucidity He dealt with "the prevalent feeling of alarm" in connexion with the recent series of reverses and disasters He said that the country can take these things "if it is sure that something vital is not being missed, that we are working on a plan which is reasonably sound and that there is *not some fundamental error*, either in our organisation or in our outlook" What was necessary was an "exact knowledge of weapons and equipment," and science and engineering should be regarded as equal partners, and not merely the handmaidens, of statecraft and generalship "This expert knowledge of weapons is not the same thing as a rhetorical habit of using brave adjectives about big and beautiful bombs" Professor Hill called for a combined general staff with executive functions and for the continuous pursuit of operational research by a technical staff which is a part of it He also referred to "a scientific panel" which has been sitting for about nine months advising the Admiralty and asked whether "due and urgent regard is being paid to their *somewhat* drastic findings" The debate went on for two days and was wound up by Sir Stafford Cripps, who replied in detail to many of the points raised The replies pleased the House and, as Mr Austin Hopkinson said, "So direct have his statements been that it will be our duty to watch him and see that they are implemented as clearly as they were stated" The House at any rate has come out of the rhetorical clouds

* * *

One of the especially interesting announcements in the House during the week was given by Mr Attlee in answer to Miss Eleanor Rathbone when he set out the revised constitution of the committee of inquiry on the women's services A short time ago the Government's announcement that four male under secretaries were to investigate conditions in the ATS, WAAF and WRNS was greeted with a howl of protest The protest led to the appointment of a large committee to go in delegation to discuss the matter with an embarrassed Mr Attlee This climb down of the Government is the result The new committee will go thoroughly into accommodation, illness, food, drilling and duties and indeed any question which seems relevant to the morale and health of the women's services Miss Ward and Lady Davidson, who are not on the committee, will place the evidence they have gathered on women's services before it, and Navy, Army and Air Force staffs will be anxious to help Some camps have been adversely criticised and there have been whispers of bad conditions But there is certainly no grave scandal to uncover though many adjustments in conditions of service might well be made The House is satisfied that a predominantly women's committee has been appointed Up to the present time there has not been an adequate representation of women on the staffs of Army commands and of corresponding Naval and Air Force formations

---

Replying to a question, Mr T JOHNSTON stated In Scotland the maternal mortality rates per 1000 live births for the years 1939 1940 and 1941 were 4 5, 4 4 and 4 9 respectively Schemes under the Maternity Services (Scotland) Act 1937, are in operation in 40 out of the 55 local authority areas

QUESTION TIME

Women's Service Inquiry

Mr C ATTLEE, replying to Miss ELEANOR RATHBONE, announced that after considering the representations made by members of the House the Government have decided to set up a committee with the following terms of reference

> To inquire into and report on amenities and welfare conditions in the three women's Services and to make recommendations

The committee will consist of the following

> Miss Violet Markham, deputy chairman of the Assistance Board (chairman), Miss Thelma Cazalet, M P, Mrs Walter Elliot chairman of the National Council of Girls' Clubs, Major James Milner, M P, Air Vice Marshal Sir David Munro, M D secretary of the Industrial Health Board of the Medical Research Council Mrs J L Stocks principal of Westfield College, University of London, Dr Edith Summerskill, M P, and Major General Sir Frederick Sykes, M P

University Grants

In view of the vital part played by the universities in the life of the community, the importance of maintaining so far as possible standards of university education, and the essential contribution of the universities towards the national effort, the provision for 1941 was maintained at the same level as that for 1939 and 1940, namely, £2,149,000 The impact of the war on university finance has so far been less severe than was expected On the other hand, while the repair of physical damage resulting from enemy action can be dealt with under the existing War Damage legislation, the repair of war damage is by no means the only problem, involving large demands on university funds, which will arise on the conclusion of hostilities With these considerations in mind the Government, after considering a report from the University Grants Committee, have again decided to maintain the provision for 1942 at its existing level (Sir KINGSLEY WOOD replying to Sir E GRAHAM-LITTLE)

Hours of Work for Boys

Mr KENNETH LINDSAY asked the Minister of Labour what steps he is taking to restrict the hours of labour for boys between the ages of 14 and 18, so that they can take advantage of the scheme of National Youth Service?—Mr E BEVIN replied I am desirous of assisting the scheme in every possible way, but in present circumstances I should not be justified in doing so by reducing the hours of work below those which are legally permissible and are reasonably practicable in the particular establishment —Mr LINDSAY Is the Minister aware that of six boys whom I interviewed last night under the National Registration Scheme one was working 77 hours a week, one 68 and one 66!—that is 50% of the boys whom I saw, and while I admit that not one of them objected to helping the national effort in this way, is it the policy of the department to agree to such hours?—Mr BEVIN Not to such hours as those

NHI Administration

The Secretary of State for Scotland and the Minister of Health have recently reviewed the administration of National Health Insurance, with a view to effecting the maximum economy in man power Some of the more important economies decided upon will be embodied in a circular which is to be issued to approved societies shortly, and others will be announced so soon as the necessary regulations have been made under the war time powers conferred by section 8 of the National Health Insurance Act, 1941 These emergency measures for the simplification of work will be brought into operation from the earliest practicable dates, so that societies may be afforded the greatest possible relief in the current half-year (Miss F HORSBRUGH replying to Mr D G LOGAN)

Mental Defect in Discharged Soldiers

Before being discharged from the Army soldiers suffering from serious mental defects are given a period of treatment in suitable military institutions, with the object of restoring them to such a degree of mental health as will permit of their being sent to their homes on discharge Those who still cannot safely be cared for in their own homes are transferred to appropriate civil institutions (Mr D SANDYS replying to Mr L W SALT)

Service Pensions for Psychoneurotics

Provision is made by the Ministry of Pensions for the treatment in special neurological centres under the EMS of men discharged from the Services suffering from neurosis

Obituary

CHARLES EVANS ELLIOTT

M B CAMB., ACTING SQUADRON-LEADER R A F V R

Squadron-Leader C E Elliott, who was killed in Malaya a few weeks ago, was the son of the late Dr Charles Elliott who for many years had been a medical missionary at Chengtu-Szechuan. He was born in 1909 and educated at Clifton College, and Corpus Christi College, Cambridge, where he got a half-blue for putting the weight. He qualified from St George's in 1934 and after holding house-appointments there and clinical assistantships at the Infants Hospital and St John's Hospital for Skin Diseases he went into practice with his father in Leicester. He took his B Chir in 1936 and in the same year left Leicester to set up in practice on his own at Hyde Park Gate. He had joined the R A F V R early in 1939 and shortly before the outbreak of war he was called up, and saw some service in France. He was sent to Singapore about a year ago. A friend writes: Elliott was a magnificently built man, who always kept himself in good training. His keen and inquiring mind made him a good companion, and many friends shared his infectious enthusiasms. But medicine was always his main interest and he spent much of his leisure reading and attending hospital clinics, eager to keep in touch with new ideas which could be usefully applied in general practice.

FRANK LEWIS SMITH

C B E, M R C S, SURGEON REAR-ADMIRAL R N

Surgeon Rear-Admiral Lewis Smith's sudden death on Feb 18 on his way to work in the department which he loved is probably what he himself would have wished, but both the Navy and its medical branch are the poorer for it. Born in 1881, the son of Ralph Smith of Whitby, he was educated at Dulwich and St Thomas's. He entered the Royal Navy in 1909 and returned to England from service in China shortly before the last war. He served in the Royal Navy hospital at Pembroke Dock till 1916, when he joined H M S *Caroline* in the Grand Fleet. Later he was appointed to the Royal Naval hospital at Chatham as specialist in radiology. After further sea service as senior medical officer of the aircraft carriers *Hermes* and *Furious* he came to the Admiralty in 1926 as assistant to the medical director-general. On his promotion to surgeon captain in 1931 he went as principal medical officer to the Royal Naval barracks at Portsmouth. Three years later he was put in medical charge of the Royal Marine infirmary and depot at Deal. When he retired in 1938 he was advanced to the rank of surgeon rear-admiral. His cheerfulness and knowledge of the world and of the service made many turn to him for counsel, and he was always ready to help. Nothing was too much trouble, and if he did not know the answer he could always suggest a way to find it. In 1915 he married Gertrude Mary Thomas and they had one daughter.

ARTHUR KEITH GIBSON

M B EDIN, MAJOR R A M C

SMALL, round-faced, dark and active, with a liquid Scottish accent tapping an unfathomed source of droll conversation, Dr Arthur Keith Gibson was not the standard pattern of a heroic figure; he certainly never saw in himself a resemblance to anyone more distinguished than Plain Mr York of York, Yorks, of whom he could at one time give a telling impersonation. But to those who knew him it is no surprise to learn that he volunteered to look after Russian prisoners with typhus in a German camp.

He studied medicine at Edinburgh University, qualifying M B in 1916. After holding house appointments at the Royal Infirmary he joined the RAMC special reserve and reached the rank of captain. Later he went into general practice in North Kensington—a hard practice where many poor families lived in overcrowded rooms and often hesitated to call in the doctor for fear of the expense. Gibson, who had become a keen member of the British Medical Association, was always planning ways in which the dependants of insured persons could be provided with regular medical attention without being haunted by this dread of a bill. He was one of the prime movers in establishing the London Public Medical Service—a scheme for insuring poor people for a very small weekly sum against all their medical needs. He insisted that the scheme must be thorough, sound and business like, and with great vigour and fertility he went into every detail. Even the monogram for the notepaper must be just so; his blotters about that time were covered with the letters LPMS entwined in a variety of entrancing ways. But with all his interest in detail he had a keen eye for an intelligent short cut. His interest in medical politics led him far in the BMA, to which he became regional secretary for the London area—the first to be appointed in England.

In 1939 he rejoined the RAMC with a temporary commission as major, and while acting as registrar to a military hospital was taken by the enemy at the time of Dunkirk. Under the Geneva Convention a medical prisoner cannot be asked to help in the treatment of infectious disease; Gibson chose to work hard for the Russian prisoners whom he had offered to attend, and died himself of the infection. In a report to the Swiss Red Cross the German medical authorities pay tribute to him, and he was buried with full military honours. He leaves a wife and children.

KENNETH MACKENZIE

M D, M CH EDIN, F R C S

Mr Kenneth Mackenzie, who died at Auckland on Jan 15, at the age of 56, was an outstanding figure in New Zealand medicine. After graduating from Edinburgh in 1908 Mr Mackenzie gained his M D in 1911, his fellowship in 1912 and his M Ch in 1913. He returned to New Zealand to practise as a consulting surgeon and was soon appointed to the honorary staff of the Auckland Hospital where for many years he has been one of the senior surgeons. He was a grand teacher with a natural gift for imparting knowledge, and his ward rounds will be remembered by successive generations of students. Although his special interest was in gynæcological surgery Mackenzie was an accomplished and skilful general surgeon who could perform with equal finesse an excision of the larynx or a radical clearing of the pelvis, and the more difficult the case became, the more confidently he seemed to handle it. In all he undertook he was thorough. Case-notes of every patient under his care, either in private or in hospital practice, were filed. Nor were these records left undisturbed, for by careful analysis of his work and results Mackenzie was always striving for greater perfection.

GEORGE BERTRAM DAVIS

F R C S

Mr Bertram Davis, who died on Jan 29, was the middle of three brothers educated at Bishop's Stortford College. Bertram was on the classical side and was a gifted actor and musician as well as a first-class cricketer. He qualified from King's College Hospital in 1934, and after holding house-appointments took his fellowship in 1936. Surgery, writes an old schoolfellow, was his strong bent and his method of retaining an indwelling catheter in the urethra with four pipe-cleaners has been described in most general and urogenital works on surgery. He left England a few years ago and took over the running of a leper colony in Southern Rhodesia, where he did useful work. But he found the climate bad, and contracted malaria. His spleen was removed about a year ago, but the disease lingered in his body and he died suddenly in a malarial coma at the age of 31.

RICHARD HUGH SMITH

B A CAMB, M R C S, LIEUTENANT R A M C

Dr R H Smith died suddenly from cerebral hæmorrhage at Enniskillen on Feb 18 some two months after he had joined the RAMC. He was educated at Cambridge University, where he graduated B A in 1932 and qualified from St Thomas's Hospital in the same year. He joined a firm of general practitioners in Poole two years later. N H R H writes: Smith always preferred to work among the poorer classes and he would go out of his way to give them the best that was in him. He loved the country and was happy attending country folk. His hobby was agriculture and he was an enthusiastic supporter of the Government scheme for growing more food at home. He spent a great deal of his spare time working on his own plot of land.

Notes, Comments and Abstracts

PICKING THE LEADER

IN the selection of potential officers for the German army[1] nothing is left to the intuition of the officer commanding the training units. All available tests are applied, from the analysis of the candidate's handwriting and Rorschach's ink-blot test to tasks close to life situations which have to be mastered under heavy stress or in a state of fatigue. Involuntary movements and behaviour are registered during tests demanding maximal physical and mental effort. The examination lasts for two days and 98% successes are claimed from a follow-up of the candidates' army careers. To bring testing of character and temperament nearer to real-life situations is the principal aim of a test suggested by R. B. Cattell,[2] who thinks little of the clinical and other methods now in use. In his "cursive miniature situation" test a strip of paper moves past a small window in a writing desk. The paper presents a succession of lines and patterns on which the subject has to make pencil strokes according to instructions—marking all horizontal lines, circling clusters of lines, or the like. Surprise patterns, patterns not covered by the instructions, and other impediments are introduced. The strip can be run through at normal and at an increased speed, with distractions, with encouragement, with intimidation, or when the subject is tired, and the scores compared.

To the clinician studying personalities this new device still seems to retain the laboratory atmosphere which restricts the value of so many personality tests. At best, the candidate will look on it as an amusing game; but even so, it seems as remote from the reality of a game of tennis—which Cattell uses as an example of a "miniature life situation"—as tennis is from real life. It is by no means easy to find a suitable group of people in which to demonstrate the validity of the method. Cattell chose 50 delinquents from a prison and the same number of mixed psychotics from a mental hospital and found their average scores differing from an equal group of "normals." But the idea that there are types or features of character common to all delinquents has been given up since Lombroso's time, and there is plenty of evidence that psychotics, even those labelled with one psychiatric diagnosis, vary in their personalities just as much as normal people. That their ratings in Cattell's test diverged from those of normals is easily explained from the behaviour of psychotics and delinquents in all kinds of experiments: they are either not willing or not able to "play." It would perhaps be better to use groups in which some positive or negative personal qualities can be assumed from their station in life, such as chartered accountants or engine-drivers, swindlers or brutal criminals.

There is still much to be said for the clinical method of character study which has proved reliable enough in the psychiatrist's work—*having a full account of the person's* life history and comparing his own subjective version of it with as many as possible objective data. It cannot be completed, like Cattell's test, in twenty minutes, but it does not take two days, and it can be done without the help of Gestapo and informers if there is a psychiatric social worker to collect the facts.

BLACK CURRANT PURÉE

THE handy orange of the old days has no equally handy substitute, which gives us a chance to become familiar with sundry agreeable variations on a theme. Workers have demonstrated the vitamin C content of hips and black currants, and we have learned to value the resources of the ordinary potato. Mothers of young children are perhaps the only people who still feel seriously the lack of oranges, so convenient for infants who could usually be backed to like the flavour. For the last two years, however, many mothers, as well as welfare centres and children's departments of hospitals, have been using black currant purée with success, and the Ministry of Food has now sponsored the making of a large supply of the purée, by Messrs. Chivers & Sons, for children under two years old. Made from finely sieved black currants with added syrup, it has a natural content of 55 mg. of ascorbic acid per 100 g. This is equivalent to the vitamin C content of orange juice and amounts to 400 international units per fluid ounce. In addition to the supply designed for children under 2 there will be a limited quantity available for older children and invalids. By agreement with the Ministry of Food the purée will be sold only by chemists and reserved for the use of children and invalids, and it is now on sale.

ARTERIAL SURGERY

KEATS is reported to have ". . . scribbled while the precepts of Sir Astley Cooper fell unheeded on his ear." Yet even in Keats, whose heart was not for medicine, such deafness was exceptional; many of his notes begin, attentively enough, "Mr. C. says . . ." And was he not singled out from among several hundred students by Cooper to help his own dresser? It is more than a hundred years since the older giant responded in this way to the different quality of the younger; the centenary of Sir Astley Cooper's death was the occasion for a special number of the *Guy's Hospital Reports* in which the well-known portrait is reproduced and his biography, told by the late Sir Charters Symonds, is reprinted from an earlier number of the *Reports*. The rest of the number is given up to arterial surgery in recognition of the important work of Astley Cooper in this field, and one of his original lectures on aneurysm is republished, in which he paid charming tribute to the genius of John Hunter and described in detail the operation for popliteal aneurysm. Mr. R. C. Brock, who has taken over the editorship from Sir Arthur Hurst, reviews Cooper's work on arterial surgery—particularly in relation to ligature of the carotid artery, the external iliac artery and the abdominal aorta—and his experiments on the use of catgut; Cooper used buried catgut as early as 1817 and was probably the first surgeon to do so. Brock also contributes an essay on pulmonary artery ligation, and describes a case of brachial embolectomy, and a case of ligature of the innominate artery after splitting the sternum, with a review of the literature on the subject. Prof. J. A. Ryle adds an historical note on arteriovenous fistula, Mr. Robert Davies-Colley an article on the pathological significance of cirsoid aneurysm, and Mr. Nils Eckhoff his experiences in treating a large cirsoid aneurysm of the chest wall. Mr. D. W. C. Northfield presents a masterly discourse on angiomatous malformations of the brain. Mr. Lancelot Bromley and Mr. D. F. Freebody describe resection and anastomosis of the external iliac artery during the removal of a seminoma of an abdominal testis, and Mr. E. G. Slesinger an unusual case of painful œdema of all four limbs, relieved in three by ganglionectomy. Mr. W. H. Ogilvie records the cure of an aneurysm of the extracranial portion of the vertebral artery by proximal ligature, and Dr. A. G. Hardy and Dr. H. E. H. Denham report a case of Ogilvie's of bilateral excision of popliteal aneurysm. Dr. C. K. Simpson describes traction rupture of the great vessels following traumatic hyper-extension of the head, and Mr. S. Cohen contributes a comprehensive article on traumatic arterial spasm (see *Lancet*, 1941, ii, 806). Mr. J. E. Spalding points out the surgical significance of periarteritis nodosa and Mr. H. R. Harley collects and collates all cases of popliteal aneurysm, 35 in number, previously recorded in the *Reports*. This impressive symposium from his own hospital, covering nearly every aspect of arterial surgery, is a fitting tribute to Sir Astley Cooper's work.

TIPS ABOUT HIPS

SPURRED by the reference to hip conserve in the 'sixties (*Lancet*, Jan. 24, p. 112) Mrs. Claire Loewenfeld writes to tell us of her own recipe for hips purée, of which she has long been an enthusiastic advocate. Her first experiments with hips were made in 1939 and tested by the National Institute for Research in Dairying. The hip syrup now sold by chemists meets in a measure her wish to see this abundant source of vitamin C tapped; but, as she points out, it seems natural that a woman in the country, in charge of a family of children, should prepare her own hip purée; she advises the following recipe:

Take whole and undamaged hips, top and tail them (using scissors if they are soft) and quickly wash them. Put them provided they are likely to benefit by such treatment This treatment is granted whether the condition is attributable to war service or not If the condition is accepted by the ministry as attributable to service and disablement cannot be removed by treatment pension is awarded

---

[1] Abstract in *Bull. War Med.* 1941, 2, 149.

[2] *J. gen. Psychol.* 1941, 25, [illegible]

Scientific Advice on Flour

Sir E Graham-Little asked the Lord President of the Council whether he was aware that in August, 1940, the Medical Research Council reported that flour for bread should contain the wheat germ and that chemical bleaching of flour should be prohibited, but that up to the present 95% of the flour issued had been deprived of all its wheat germ and been chemically bleached, and whether he would, in conjunction with the Ministry of Food, ensure that effect was given to the recommendations of the Medical Research Council —Sir John Anderson replied I am aware of the recommendations which the Medical Research Council have made on this subject As regards the prohibition of chemical bleaching and "improving," the recommendation has been qualified by the statement that further investigation is necessary In answer to the second part of the question, I may explain that the function of the council is to give scientific advice on the basis of existing knowledge and to promote research where that knowledge is inadequate The action to be taken is primarily a responsibility of the Ministry of Food

Communal Feeding Centres

Replying to a question, Major G Lloyd George said The numbers of communal feeding centres (i e Londoners' Meals Service centres and centres set up by voluntary organisations) set up in London are as follows City, 5, Westminster, 9, county of London, 228, making a total of 242

Fire-watchers' Bedding

Mr Rhys Davies asked the Home Secretary whether he will arrange for all bedding used by fire watchers and kindred services to be fumigated periodically ?—Mr H Morrison replied I think it may reasonably be assumed that local authorities are alive to the importance of suitable preventive measures of this kind in services for which they are directly responsible, while the Fire Prevention (Business Premises) Order placed an obligation on the occupier of the premises to provide and maintain proper bedding, and the enforcement of this obligation is a matter for the appropriate authority under the order —Mr Davies Would the Minister be good enough to call the attention of the local authorities to this problem, so that bedding may be fumigated to prevent the spread of scabies and other diseases ?—Mr Morrison I will consider that point, but fire watchers are very active in making complaints if anything is wrong and I, of course, look into their complaints

Public Health

From the Annual Reports

CHESTER AND EXETER

Both these ancient cathedral cities have become industrialised and possess county borough powers Exeter has 9127 acres and 79,960 inhabitants, giving a density of 8 8, Chester has 4142 acres and 46,960 inhabitants, giving a density of 9 1 But whereas Exeter has 20,046 inhabited houses, giving a house density of 3 9, Chester has 14,468 houses giving a density of but 3 2 We should therefore expect Dr G B Page, of Exeter, to give a less favourable report of those signs of ill health which we associate with overcrowding than Dr J W Lobban of Chester, but the reverse is true The infantile mortality of Chester was 64 7, that of Exeter 38 7, in Chester the deaths in the old zymotic group were 5 from measles, 2 from whooping-cough, 10 from diphtheria, 3 from infectious encephalitis, 6 from cerebrospinal fever and 4 from diarrhœa, against 6 from diphtheria, 1 from dysentery, 4 from cerebrospinal fever and 5 from diarrhœa in Exeter In Exeter 78 cases of pneumonia were notified with only 4 deaths, 3 of which were in persons over 65 years of age In Chester 69 cases were notified; the total deaths from pneumonia were 50 but how many of these were in notified cases is not stated Exeter had 147 new cases and 49 deaths from tuberculosis; Chester 56 new cases and 28 deaths There were no maternal deaths in Chester and 2 in Exeter The birth-rates were 13 7 in Exeter and 15 7 in Chester and the death-rates 13 4 and 15 2 respectively

Dr Lobban reports that of 57 cases of verified cerebrospinal fever 4 died and the other 53 made complete recoveries without sequelæ Dr Page reports 39 cases of this disease with 4 deaths He also mentions a sharp outbreak of paratyphoid B (46 cases in Exeter and 14 in the surrounding area), traced to confectionery, most probably to contaminated artificial cream There were no deaths Outbreaks of paratyphoid traced to confectionery have been fairly common of late, but they have been less severe clinically than the outbreaks traced to meat preparations which were more usual in past years Medically the most interesting features of these two reports are the low fatality of notified pneumonia in Exeter and the low fatality and absence of sequelæ of cerebrospinal fever in both cities, for there is no doubt that these results were in great part due to chemotherapy

DERBYSHIRE

This county is slightly larger than Cheshire, having 635,454 acres, but has a population of only 636,890, of whom 299,040 live in rural districts In 1940 its birth rate was 15 54, death-rate 12 24 Dr W M Ash, country medical officer, comments on the rise in infant mortality to 55 4 (47 4 in 1939 and 51 1 in 1938) There were 86 more infant deaths in 1940 than in 1939, of which 57 were due to bronchitis and pneumonia This increase is attributed mainly to the severe weather of the first quarter In the first quarter of this year, which though severe was less so than in 1940, the excessive death-rate was not repeated In the winter of 1940 there were no alerts, in that of 1941 there were many, so it is wrong to deduce that these deaths from respiratory diseases were due to shelter life Dr Ash hastens to add that he hopes that "whoever reads this comment will read only what I have said and not read into it that I suggest there can be no danger in taking children from warm beds to shelters" The infantile mortality of England and Wales increased from 50 to 55 in 1940, the increased mortality was mainly in the first quarter and due almost entirely to respiratory infection Severe winters are not generally associated with high infantile mortality, and in Saskatchewan, which has the most vigorous winter in the Empire, infantile mortality is low in that season In England in 1940, however, we had the blackout as well as the winter, so ventilation in the coldest period was almost as bad as human ingenuity could devise Of the total death-rate of 12 24 only 0 14 was attributable to the seven principal zymotics, little more than 1% and exactly a tenth of the mortality from cancer

Infectious Disease in England and Wales

WEEK ENDED FEB 21

Notifications —The following cases of infectious disease were notified during the week, smallpox, 0, scarlet fever, 1159, whooping-cough, 1211, diphtheria, 855, paratyphoid, 6, typhoid, 3, measles (excluding rubella), 1996, pneumonia (primary or influenzal), 996, puerperal pyrexia, 182, cerebrospinal fever, 187, poliomyelitis, 6; polio-encephalitis, 1, encephalitis lethargica, 5, dysentery, 137, ophthalmia neonatorum, 85 No case of cholera, plague or typhus fever was notified during the week

Deaths —In 126 great towns there were 3 (0) deaths from enteric fever, 1 (0) from scarlet fever, 1 (0) from measles, 8 (2) from whooping-cough, 32 (3) from diphtheria, 30 (4) from diarrhœa and enteritis under 2 years, and 62 (1) from influenza The figures in parentheses are those for London itself

Manchester, Nottingham and Cardiff each reported 1 death from an enteric fever There were 10 fatal cases of influenza at Birmingham, no other great town reporting more than 4 Liverpool had 4 deaths from diphtheria

The number of stillbirths notified during the week was 239 (corresponding to a rate of 42 per thousand total births), including 32 in London

---

Society of Medical Officers of Health —A meeting of the fever hospital service group of this society is to be held on Friday, March 27, at 3 P M in BMA House, Tavistock Square, London, W C 1, when Mr L F Hewitt of Belmont Laboratories will speak on recent advances in the preparation of antitoxin

Notes, Comments and Abstracts

PICKING THE LEADER

N the selection of potential officers for the German my[1] nothing is left to the intuition of the officer mmanding the training units All available tests are plied, from the analysis of the candidate s handwriting d Rorschach's ink-blot test to tasks close to life uations which have to be mastered under heavy stress in a state of fatigue Involuntary movements and haviour are registered during tests demanding maximal physical and mental effort The examination lasts two days and 98% successes are claimed from a low-up of the candidates' army careers To bring ting of character and temperament nearer to real-life uations is the principal aim of a test suggested by R B ttell,[2] who thinks little of the clinical and other methods w in use In his " cursive miniature situation " test a ip of paper moves past a small window in a writing sk The paper presents a succession of lines and tterns on which the subject has to make pencil strokes cording to instructions—marking all horizontal lines, cling clusters of lines or the like Surprise patterns, tterns not covered by the instructions, and other pediments are introduced The strip can be run rough at normal and at an increased speed with distractions with encouragement with intimidation, or hen the subject is tired and the scores compared

To the clinician studying personalities this new device ill seems to retain the laboratory atmosphere which stricts the value of so many personality tests At best, e candidate will look on it as an amusing game , but en so, it seems as remote from the reality of a game of nnis—which Cattell uses as an example of a " miniature e situation '—as tennis is from real life It is by no eans easy to find a suitable group of people in which to emonstrate the validity of the method Cattell chose) delinquents from a prison and the same number of ixed psychotics from a mental hospital and found their verage scores differing from an equal group of " normals " But the idea that there are types or features of haracter common to all delinquents has been given up nce Lombroso's time ; and there is plenty of evidence hat psychotics, even those labelled with one psychiatric iagnosis, vary in their personalities just as much as ormal people That their ratings in Cattell's test iverged from those of normals is easily explained from he behaviour of psychotics and delinquents in all kinds f experiments they are either not willing or not able to ' play " It would perhaps be better to use groups in hich some positive or negative personal qualities can e assumed from their station in life, such as chartered ccountants or engine-drivers, swindlers or brutal riminals

There is still much to be said for the clinical method of character study which has proved reliable enough in the psychiatrist's work—having a full account of the person s life history and comparing his own subjective version of it with as many as possible objective data It cannot be completed, like Cattell's test, in twenty minutes, but it does not take two days, and it can be done without the help of Gestapo and informers if there is a psychiatric social worker to collect the facts

BLACK CURRANT PURÉE

THE handy orange of the old days has no equally handy substitute, which gives us a chance to become familiar with sundry agreeable variations on a theme Workers have demonstrated the vitamin C content of hips and black currants, and we have learned to value the resources of the ordinary potato Mothers of young children are perhaps the only people who still feel seriously the lack of oranges so convenient for infants who could usually be backed to like the flavour For the last two years, however many mothers as well as welfare centres and children s departments of hospitals, have been using black currant puree with success and the Ministry of Food has now sponsored the making of a large supply of the puree, by Messrs Chivers & Sons, for children under two years old Made from finely sieved black currants with added syrup, it has a natural content of 55 mg of ascorbic acid per 100 g This is equivalent to the vitamin C content of orange juice and amounts to 400 international units per fluid ounce. In addition to the supply designed for children under 2 there will be a limited quantity available for older children and invalids By agreement with the Ministry of Food the puree will be sold only by chemists and reserved for the use of children and invalids ; and it is now on sale

ARTERIAL SURGERY

KEATS is reported to have " . . scribbled while the precepts of Sir Astley Cooper fell unheeded on his ear." Yet even in Keats, whose heart was not for medicine such deafness was exceptional , many of his notes begin attentively enough, " Mr C says " And was he not singled out from among several hundred students by Cooper to help his own dresser ? It is more than a hundred years since the older giant responded in this way to the different quality of the younger , the centenary of Sir Astley Cooper's death was the occasion for a special number of the *Guy's Hospital Reports* in which the well-known portrait is reproduced and his biography, told by the late Sir Charters Symonds, is reprinted from an earlier number of the *Reports* The rest of the number is given up to arterial surgery in recognition of the important work of Astley Cooper in this field, and one of his original lectures on aneurysm is republished, in which he paid charming tribute to the genius of John Hunter and described in detail the operation for popliteal aneurysm Mr R C Brock who has taken over the editorship from Sir Arthur Hurst, reviews Cooper s work on arterial surgery—particularly in relation to ligature of the carotid artery, the external iliac artery and the abdominal aorta—and his experiments on the use of catgut , Cooper used buried catgut as early as 1817 and was probably the first surgeon to do so Brock also contributes an essay on pulmonary artery ligation, and describes a case of brachial embolectomy, and a case of ligature of the innominate artery after splitting the sternum with a review of the literature on the subject Prof J A Ryle adds an historical note on arteriovenous fistula, Mr Robert Davies-Colley an article on the pathological significance of cirsoid aneurysm, and Mr Nils Eckhoff his experiences in treating a large cirsoid aneurysm of the chest wall Mr D W C Northfield presents a masterly discourse on angiomatous malformations of the brain Mr Lancelot Bromley and Mr. D F Freebody describe resection and anastomosis of the external iliac artery during the removal of a seminoma of an abdominal testis, and Mr E G. Slesinger an unusual case of painful œdema of all four limbs, relieved in three by ganglionectomy. Mr W H Ogilvie records the cure of an aneurysm of the extracranial portion of the vertebral artery by proximal ligature, and Dr A. G. Hardy and Dr H E H Denham report a case of Ogilvie's of bilateral excision of popliteal aneurysm Dr C K. Simpson describes traction rupture of the great vessels following traumatic hyper-extension of the head and Mr S Cohen contributes a comprehensive article on traumatic arterial spasm (see *Lancet*, 1941, ii, 806) Mr. J E Spalding points out the surgical significance of periarteritis nodosa and Mr H R Harley collects and collates all cases of popliteal aneurysm, 35 in number, previously recorded in the *Reports* This impressive symposium from his own hospital covering nearly every aspect of arterial surgery, is a fitting tribute to Sir Astley Cooper's work.

TIPS ABOUT HIPS

SPURRED by the reference to hip conserve in the 'sixties (*Lancet*, Jan 24, p 112) Mrs Claire Loewenfeld writes to tell us of her own recipe for hips puree, of which she has long been an enthusiastic advocate Her first experiments with hips were made in 1939 and tested by the National Institute for Research in Dairying The hip syrup now sold by chemists meets in a measure her wish to see this abundant source of vitamin C tapped , but as she points out it seems natural that a woman in the country, in charge of a family of children, should prepare her own hip puree , she advises the following recipe

Take whole and undamaged hips, top and tail them (using scissors if they are soft) and quickly wash them Put them provided they are likely to benefit by such treatment This treatment is granted whether the condition is attributable to war service or not If the condition is accepted by the ministry as attributable to service and disablement cannot be removed by treatment pension is awarded

---

[1] Abstract in *Bull War Med* 1941 2 149
[2] *J gen Psychol* 1941, 25 59

Scientific Advice on Flour

Sir E GRAHAM-LITTLE asked the Lord President of the Council whether he was aware that in August, 1940, the Medical Research Council reported that flour for bread should contain the wheat germ and that chemical bleaching of flour should be prohibited, but that up to the present 95% of the flour issued had been deprived of all its wheat germ and been chemically bleached, and whether he would, in conjunction with the Ministry of Food, ensure that effect was given to the recommendations of the Medical Research Council —Sir JOHN ANDERSON replied I am aware of the recommendations which the Medical Research Council have made on this subject As regards the prohibition of chemical bleaching and "improving," the recommendation has been qualified by the statement that further investigation is necessary In answer to the second part of the question, I may explain that the function of the council is to give scientific advice on the basis of existing knowledge and to promote research where that knowledge is inadequate The action to be taken is primarily a responsibility of the Ministry of Food

Communal Feeding Centres

Replying to a question, Major G LLOYD GEORGE said The numbers of communal feeding centres (i e Londoners' Meals Service centres and centres set up by voluntary organisations) set up in London are as follows City, 5, Westminster, 9, county of London, 228, making a total of 242

Fire-watchers' Bedding

Mr RHYS DAVIES asked the Home Secretary whether he will arrange for all bedding used by fire watchers and kindred services to be fumigated periodically ?—Mr H MORRISON replied I think it may reasonably be assumed that local authorities are alive to the importance of suitable preventive measures of this kind in services for which they are directly responsible, while the Fire Prevention (Business Premises) Order placed an obligation on the occupier of the premises to provide and maintain proper bedding, and the enforcement of this obligation is a matter for the appropriate authority under the order —Mr DAVIES Would the Minister be good enough to call the attention of the local authorities to this problem, so that bedding may be fumigated to prevent the spread of scabies and other diseases ?—Mr MORRISON I will consider that point, but fire watchers are very active in making complaints if anything is wrong and I, of course, look into their complaints

---

Public Health

From the Annual Reports

CHESTER AND EXETER

BOTH these ancient cathedral cities have become industrialised and possess county borough powers Exeter has 9127 acres and 79,960 inhabitants, giving a density of 8 8, Chester has 4142 acres and 46,960 inhabitants, giving a density of 9 1 But whereas Exeter has 20,046 inhabited houses, giving a house density of 3 9, Chester has 14,468 houses giving a density of but 3 2 We should therefore expect Dr G B Page, of Exeter, to give a less favourable report of those signs of ill health which we associate with overcrowding than Dr J W Lobban of Chester, but the reverse is true The infantile mortality of Chester was 64 7, that of Exeter 38 7, in Chester the deaths in the old zymotic group were 5 from measles, 2 from whooping-cough, 10 from diphtheria, 3 from infectious encephalitis, 6 from cerebrospinal fever and 4 from diarrhœa, against 6 from diphtheria, 1 from dysentery, 4 from cerebrospinal fever and 5 from diarrhœa in Exeter In Exeter 78 cases of pneumonia were notified with only 4 deaths, 3 of which were in persons over 65 years of age In Chester 69 cases were notified, the total deaths from pneumonia were 50 but how many of these were in notified cases is not stated Exeter had 147 new cases and 49 deaths from tuberculosis; Chester 56 new cases and 28 deaths There were no maternal deaths in Chester and 2 in Exeter The birth-rates were 13 7 in Exeter and 15 7 in Chester and the death-rates 13 4 and 15 2 respectively

Dr Lobban reports that of 57 cases of verified cerebrospinal fever 4 died and the other 53 made complete recoveries without sequelæ Dr Page reports 39 cases of this disease with 4 deaths He also mentions a sharp outbreak of paratyphoid B (46 cases in Exeter and 14 in the surrounding area), traced to confectionery, most probably to contaminated artificial cream There were no deaths Outbreaks of paratyphoid traced to confectionery have been fairly common of late, but they have been less severe clinically than the outbreaks traced to meat preparations which were more usual in past years. Medically the most interesting features of these two reports are the low fatality of notified pneumonia in Exeter and the low fatality and absence of sequelæ of cerebrospinal fever in both cities, for there is no doubt that these results were in great part due to chemotherapy

DERBYSHIRE

This county is slightly larger than Cheshire, having 635,454 acres, but has a population of only 636,890, of whom 299,040 live in rural districts In 1940 its birth rate was 15 54, death-rate 12 24 Dr W M Ash, country medical officer, comments on the rise in infant mortality to 55 4 (47 4 in 1939 and 51 1 in 1938) There were 86 more infant deaths in 1940 than in 1939, of which 57 were due to bronchitis and pneumonia This increase is attributed mainly to the severe weather of the first quarter In the first quarter of this year, which though severe was less so than in 1940, the excessive death-rate was not repeated In the winter of 1940 there were no alerts, in that of 1941 there were many, so it is wrong to deduce that these deaths from respiratory diseases were due to shelter life Dr Ash hastens to add that he hopes that "whoever reads this comment will read only what I have said and not read into it that I suggest there can be no danger in taking children from warm beds to shelters" The infantile mortality of England and Wales increased from 50 to 55 in 1940, the increased mortality was mainly in the first quarter and due almost entirely to respiratory infection Severe winters are not generally associated with high infantile mortality, and in Saskatchewan, which has the most vigorous winter in the Empire, infantile mortality is low in that season In England in 1940, however, we had the blackout as well as the winter, so ventilation in the coldest period was almost as bad as human ingenuity could devise Of the total death-rate of 12 24 only 0 14 was attributable to the seven principal zymotics, little more than 1% and exactly a tenth of the mortality from cancer

Infectious Disease in England and Wales

WEEK ENDED FEB 21

Notifications —The following cases of infectious disease were notified during the week, smallpox, 0, scarlet fever, 1159, whooping-cough, 1211, diphtheria, 855, paratyphoid, 6, typhoid, 3, measles (excluding rubella), 1996, pneumonia (primary or influenzal), 996, puerperal pyrexia, 182, cerebrospinal fever, 187, poliomyelitis, 6; polio-encephalitis, 1, encephalitis lethargica, 5, dysentery, 137, ophthalmia neonatorum, 85 No case of cholera, plague or typhus fever was notified during the week

Deaths —In 126 great towns there were 3 (0) deaths from enteric fever, 1 (0) from scarlet fever, 1 (0) from measles, 8 (2) from whooping-cough, 32 (3) from diphtheria, 30 (4) from diarrhœa and enteritis under 2 years, and 62 (1) from influenza The figures in parentheses are those for London itself

Manchester, Nottingham and Cardiff each reported 1 death from an enteric fever There were 10 *fatal cases of influenza* at Birmingham, no other great town reporting more than 4 Liverpool had 4 deaths from diphtheria

The number of stillbirths notified during the week was 239 (corresponding to a rate of 42 per thousand total births), including 32 in London

---

SOCIETY OF MEDICAL OFFICERS OF HEALTH —A meeting of the fever hospital service group of this society is to be held on Friday, March 27, at 3 P.M. in BMA House, Tavistock Square, London, W C 1, when Mr L F Hewitt of Belmont Laboratories will speak on recent advances in the preparation of antitoxin

ORIGINAL ARTICLES

CARDIAC ISCHÆMIA

J. WILSON REID, M.D., B.SC. LPOOL

THE general practitioner sees his patients through many diseases, in the course of which he acquires knowledge of the relationship of heredity, environment and constitutional types to disease of one disease to another, and of the effect of all this on prognosis. To be of value to others this knowledge must be systematised by investigation of case-histories.

My practice is of the mixed country type which like rough shooting tends to produce a mixed bag. There is however a high incidence of cardiovascular conditions, and I have become specially interested in coronary disease and its prevention treatment and prognosis. I have investigated the case-histories of all cases coming under my care with cardiac ischæmia severe enough to lead to coronary thrombosis, including only such cases as were verified by electrocardiogram or autopsy, or showed such a definite clinical picture as to leave no doubt as to the nature of the condition. There were 35 such cases in all.

Raised blood-pressure, alcohol, gout, tobacco or obesity are not specially common among these cases (see table). None of the patients was, or had been, syphilitic, and none had been in contact with lead. General arteriosclerosis giving rise to clinical signs was not very common; only 7 cases had it, although 17 showed retinal arteriosclerosis, it is wise therefore to examine the retinal vessels when coronary disease is suspected. Six had led very active lives under a good deal of strain and 6 had a bad heredity of coronary disease. Most of them (26) were comfortably off, 20 had led a sedentary life. Both husband and wife were affected in 11 cases. The husband in one case had died before the family came under my care and he is not included in the figures. I was interested to find both husband and wife affected in such a large proportion of cases, and wondered whether it came of living in the same house and in the same way. I therefore looked for other cases in people sharing a single environment and found 2 more cases, this time in sisters. Affections of the liver were present in 26 cases; of these 20 had suffered from gall-bladder disease, and 6 had had jaundice.

PREVENTION

Taking all possible predisposing factors into consideration, in most cases more than one factor was present which could have caused coronary disease, but the predominant antecedent factor was liver disease. It therefore seems to be important to maintain a healthy liver, and to deal with any liver infection as soon as it is recognised. This is specially necessary in people with a bad family history of arterial disease. I advise all patients suffering from disease of the gall-bladder to have it removed, so that there is no focus of sepsis likely to affect the arteries of the heart or by local spread to infect the liver and impair its function. Those whose livers do not function well as judged by symptoms of icterus or subicterus, are advised to take each morning a dose of magnesium sulphate in a small quantity of water before food—not a purgative dose but just enough to ensure an action of the bowel. Where this is not well tolerated for any reason—for example, because of the presence of piles—I prescribe one of the preparations of bile-salts, and advise them to take a course of calomel gr ⅛ eight doses a day for 3 consecutive days in each month, followed by a morning saline. The diet prescribed is low in fats and patients are warned of the ill effects of alcohol on the liver. In some cases where other methods have failed I have found 'Boldine Houdé' (WTCo) useful—a drug much used by the French, especially those who have had service in Indo-China. A sedentary life is one of the common predisposing factors, and encourages poor function of the liver, I therefore advise adequate exercise. This special care of liver function is of value, I believe, even when there is already disease of the coronary arteries, as the following case suggests.

CASE 1.—A woman began having angina of effort at 55. She had a bad family history, and one brother had died of angina pectoris, and two sisters suffered from it. The brother died before the symptom complex of coronary thrombosis was understood, but judging from the history he too was probably a case of this condition. My patient began by developing angina of effort on mild exertion. She had chronic cholecystitis and in view of her family history had her gall bladder removed. Though generally improved, she still suffered from angina of effort but much less severely than before. Her liver continued to be sluggish and I attributed the persistent anginal symptoms to this. An electrocardiogram in 1936 showed a spread of the whole complex, the T wave in lead 2 was practically isoelectric, and in lead 3 was inverted. In 1938 an electrocardiogram showed less spread of the PQRS complex, the T wave was less delayed in onset, and in lead 2 showed a more normal formation, in lead 3 it was no longer inverted but showed a slight peak above the isoelectric line. Clinically, cardiac and general improvement was considerable. She had in the interval been treated with the calomel and magnesium sulphate routine and had been given courses of boldine. Her diet had been supervised and corrected. Since 1938 there has been further all round improvement and now at 65 she rarely gets any effort pain and is able to do some active war work without feeling it to be a strain.

The high proportion of cases—13 out of 35—in which two people in a household suffered from cardiac ischæmia, and had had an infarct of the coronary system is possibly a freak of statistics, and might not recur with larger numbers. All these cases came from among the well-to-do; as the practice covers all sections of the community, including a fair proportion of panel patients, this is possibly significant. I think it may be related to a diet too rich in fats and deficient in vitamins B and C, which are probably necessary to the health of the heart and vessels.

Obesity (present in 6 cases) predisposes to arterial degeneration and throws an extra burden on the heart. That it shortens life is well shown in the figures published by American insurance companies. Obese subjects usually die a vascular or cardiovascular death and obesity should therefore be treated in all cases, but especially in the sedentary and those who have a family history of coronary disease, or are prone to liver affections.

Strain was noted as a factor in 6 cases; it was the strain of the mental worker, such as the doctor or the business man. Such people should take adequate holidays and should get adequate exercise to avoid obesity. Strenuous activity should not be undertaken until fitness has been gradually established, otherwise an undue strain is thrown on the coronary circulation and may precipitate the very condition to be avoided.

All foci of sepsis should be eradicated, especially in the tired, unfit and overworked. Care is necessary where the focus of sepsis is in the teeth, not more than two or three teeth should be removed at a time or more toxins may be liberated than the body defences can well cope with.

A bad family history is a warning, predisposition to the disease seems to me to breed remarkably true. Apart from care of their livers, those with a family history of the disease should try not to choose a career involving much strain and should lead active lives, they should avoid excess of alcohol and tobacco, which though not vitally important in producing coronary disease might tip the balance adversely if taken in excess when other predisposing factors are present.

All patients, especially those of middle age, who present themselves complaining of rheumatism in the arms, of pains in the chest or indigestion should be closely questioned to find out whether their pain bears any relation to exercise. In this way many cases of cardiac ischæmia may be discovered at the beginning, when there is some prospect of helping the patient and even of preventing him getting a coronary thrombosis.

TREATMENT

The treatment of cardiac ischæmia includes anything from the management of the life of a mild case of angina of effort to that of a severe case of coronary thrombosis. In dealing with a case of effort pain I obtain an electroin a clean undamaged enamel saucepan and cover with boiling water in the proportion of 5½ lb of hips to 3½ pints of water, bring them quickly to the boil and simmer for 15 min If they are boiled longer it is likely to damage the fruit and spoil the colour and the flavour, but if they are not soft enough it has to be done They are then rubbed through a fine hair or stainless steel wire sieve, nothing but a wooden presser, masher or pestle must be used for the rubbing Mix 2 lb of mashed hips with 1 lb of sugar, preferably castor, and stir the mixture for about 20 min with a wooden spoon Bring this sweetened puree to simmering point and cook it for 10 min *Store it preferably in earthenware pots*, if glass pots are used they must be kept in the dark

The puree thus made is palatable, agreeably red, and contains 200 mg of vitamin C per 100 g, as estimated by Messrs Savory & Moore This compares well with the 70 mg per 100 g of black-currant syrup, and even with the 200 mg per 100 ml of the Ministry of Health hip syrup, which works out at about 175 mg per 100 g A weak spot in the preparation may be the sugar content which is possibly not high enough to prevent trouble with yeasts and moulds It is important to avoid any metallic contamination, hence the emphasis which Mrs Loewenfeld lays on the composition of the various utensils

Medical News

University of Oxford

On Feb 28 the honorary degree of M A was conferred on Dr C A Wiggins, formerly principal medical officer in Uganda Dr Wiggins has presented to the Hope Collection his own collections of African lepidoptera

University of London

The William Julius Mickle fellowship has been awarded to Dr Alexander Fleming, professor of bacteriology at St Mary's hospital medical school

Society of Apothecaries of London

C H Kitchen, having completed the final examination, has been granted the diploma of the society entitling him to practise medicine, surgery and midwifery

Royal College of Surgeons of England

The council of the college has decided not to send out this year the first notice of the council election It was felt that there was no justification for the use of some 2000 leaflets and envelopes merely to announce the date of the election and the date by which intending candidates must send in their nomination forms But particulars about the election will be found in our advertisement columns Candidates must send in their applications to the secretary at the college by Monday, March 16, voting papers will be sent out to all fellows on Friday, March 27, and the election is on July 2

Royal Society of Medicine

The section of psychiatry of this society will meet on Wednesday, March 11, at 2 30 P M, when Dr Denis Hill and Captain J Watterson will describe studies of electroencephalograms in psychopathic personalities At the same hour the section of proctology will hold a clinicopathological meeting at St Mark's Hospital, City Road, E C 1 On March 13, at 2 15 P M, the clinical section will meet at University College Hospital, W C 1

Conference on Rehabilitation

On Friday, March 13, at 8 P M, a conference will be held at the Birmingham Accident Hospital on rehabilitation as it affects the industrial medical officer Prof Seymour Barling will be in the chair and the discussion will be opened by Mr William Gissane, surgeon in chief and clinical director at the hospital, and Mr E A Nicoll, medical director of the Miners Rehabilitation Centre at Mansfield Medical practitioners and senior medical students are invited to attend

Play Centres in London

The LCC is organising play centres for the children of women workers in localities suggested by the Ministry of Labour Each centre, as it is opened, is advertised in the local press, in works and factories, and at the labour exchanges, it is then on trial for six weeks and at the end of that time the Ministry decides whether it is really needed Teas are provided by the Londoners' meal service Sixteen centres are already open and the Ministry have in all suggested 46 areas in 19 metropolitan boroughs where they think they should be tried

Hospitals Day

This year the voluntary hospitals of London are holding their flag day on Tuesday, May 5 Offers of help should be sent to Lord Luke, chairman of the London Hospitals Street Collections Central Committee, 36, Kingsway, W C 2

Sydney Ringer Lecture

Prof F R Winton will deliver the fourteenth biennial Sydney Ringer lecture at University College Hospital medical school, on Tuesday, March 17, at 4 P M He will speak on the physical factors controlling the formation of urine The lecture is open to medical practitioners and students

Medical Honours

The military cross has been awarded to the following R A M C officers in recognition of gallant and distinguished services in the Middle East Captain C D Anderson, M B Camb, Captain Niels Pedersen, M B Edin, and Captain J S Prichard, M B Camb

Paddington Medical Society

The next meeting of this society will take place on Tuesday, March 10, at St Mary's Hospital at 9 P M Lieut Colonel Charles Keogh, medical adviser to the Home Guard, will speak on the arrangements for the treatment of home guards and civilian casualties in case of an invasion

The Index and title-page to Vol II, 1941, which was completed with the issue of Dec 27, will be ready shortly A copy will be sent gratis to subscribers on receipt of a post card addressed to the Manager of THE LANCET, 7, Adam Street, Adelphi, W C 2 Subscribers who have not already indicated their desire to receive indexes regularly as published should do so now

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export

Appointments

DICK ALEXANDER M B GLASG medical superintendent of Hawkhead Mental Hospital, Crookston, near Glasgow

CLINE, HENRY, M B ABERD temp R O (civil defence) for Islington

MACLAREN, D W D, M B EDIN examining factory surgeon for Thurso, Caithness

Births, Marriages and Deaths

BIRTHS

GRAHAM —On Feb 21, at Chester, the wife of Dr R Stewart Graham —a daughter

HOUGHTON —On Feb 23, the wife of Captain A C Houghton, R A M C —a son

MARTIN —On Feb 24, at Cambridge, the wife of Dr Laurence Martin—a daughter

MOIR —On Feb 23, at Ripley, Surrey, the wife of Captain J H Moir, R A M C —a daughter

PORTER —On Feb 27, at Fulmer, Bucks, to the wife of Lieutenant A G Porter, R A M C —a daughter

RICHARDSON —On Feb 21 the wife of Major J O Richardson, R C A M C, of Wootton St Lawrence near Basingstoke—a son

TURNER —On Feb 24, at Belfast, the wife of Lieut Colonel R W D Turner R A M C —a son

SCOTT BROWN —On Feb 24, the wife of Mr W G Scott Brown, F R C S of Harley Street, W 1—a daughter

WATERFALL —On Feb 24 at Yealhampton, to the wife of Flight Lieutenant W B Waterfall, F R C S —a son

DEATHS

BROWN —On Feb 23 at Richmond Park Road, Clifton, Bristol passed peacefully away after a long illness, William Brown, M D GLASG, aged 80 years

HICHENS —On Feb 24, at Hove Frank Hichens, M D LOND, D P H late of Redruth, Cornwall *aged 80*

MALINS —On Feb 24, Herbert Malins B A OXFD, M B EDIN, F R C S E, aged 72

MORRIS —On Feb 25, at Chelsea, Charles Arthur Morris, C V O, M CHIR CAMB F R C S

POND —On Feb 22, at Liverpool, Francis Aloysius Pond M R C S

PRYN —On Feb 20, at Stoke Gabriel, Devon, Sir William Wenmoth Pryn, K B E, C B, M R C S, D P H, surgeon rear admiral R N retd

RIGG —On Feb 23, at Fetcham, Surrey, Vincent John Rigg M R C S, aged 78

STEWART —On Feb 23 in London, Hugh Milton Stewart, M D CAMB

SHARPE —At Grahamstown South Africa, Samuel Howard Sharpe, M D LL D, barrister at law, King's Inn Dublin

SUTCLIFFE —On Feb 26, William Greenwood Sutcliffe, O B E, T D, F R C S of Margate

WAKELING —On Feb 24 at Bourne End, Thomas George Wakeling, O B E, M R C S, aged 77 the needs of the heart muscle I have found that such cases do specially well with treatment by ultra-short wave Using a machine with a 6-metre wave I have been able to improve the exercise tolerance of these cases considerably, and have often been able to do away with this type of pain If the general exercise tolerance *tends to fall off I have found this treatment helpful* in restoring or even improving it Where ultra-short wave treatment has not been available the patient benefits by taking a nitroglycerin tablet at the onset of the pain and persisting with exercise in a modified way until the pain passes off, but this is not so effective in developing the collateral circulation as treatment by ultra-short wave, and does not lead to such a permanent improvement

PROGNOSIS

When cardiac ischæmia is due to the gradual occlusion of some of the vessels of the heart there is time for the development of a collateral circulation which may be sufficiently good for the reduced demands made on it Such cases do quite well if they are overhauled and have all unfavourable factors in their health and habits eliminated, and lead a life within the heart's strength Their prognosis is much improved if they are treated along the preventive lines already suggested When the ischæmia is the result of a sudden occlusion, such as occurs in coronary thrombosis, at first there is profound shock, with danger of sudden death A severe degree of shock, as shown by a very low blood-pressure and ashen pallor, is a serious omen, and so is persistent severe dyspnœa

During the first 7–10 days after their first attack 12 of my cases died suddenly from shock at the onset, or from the development of a severe arrhythmia which did not respond to digitalis, or from rupture of the softened heart wall One must not therefore be tempted to give too good a prognosis at first, even when the period of shock is past, as the following case shows

CASE 2—A woman of 79 had weathered the first days satisfactorily, her blood pressure had recovered well, her kidneys were secreting adequately *and her prognosis* appeared to be good On the fourth day I was listening to her heart sounds when suddenly they broke into a ventricular tachycardia, which almost at once became ventricular fibrillation In spite of immediate intravenous strophanthin she died within a quarter of an hour of the onset of the ventricular tachycardia For at least 12 years before she had her coronary thrombosis she had suffered from gall bladder disease, but had refused surgical treatment She had had angina of effort for four years before she died, but improved on medical treatment of her gall bladder, for some time before the thrombosis she had been free of symptoms of cardiac inadequacy

During convalescence from the shock of the infarct it is difficult to estimate prognosis, and a better idea can be obtained when the patient begins to get up I would not give a favourable prognosis in cases with persistent arrhythmia only checked by digitalis, or in those who continue to be breathless on moving about in bed Again, if moisture persists at the bases of the lungs, or if the patient shows any œdema which does not clear up, the outlook cannot be good, and a persistent low blood-pressure is ominous At the end of the rest period, when the patient is beginning to give his heart something to do, one can say that cases which get much dyspnœa are not likely to do well, and any anginal pain occurring at this time must mean that the coronary circulation is inadequate and that a satisfactory collateral circulation has not been established

The outlook in the 23 cases in my series which survived the first attack varied, but in most of them it was much better than used to be thought possible At least half were able to resume work in a fairly satisfactory manner, and continued to lead useful lives Where the activities can be adjusted to the heart's limitations and there is not much evidence of coronary inadequacy (as shown by a low blood-pressure or angina of effort) the outlook as regards life seems to be quite good

A gradual return of the electrocardiogram to normal is of good prognostic significance These patients should also have an X ray of the heart taken from time to time to detect any bulging of the heart wall So long as the electrocardiogram is satisfactory and there is no X-ray evidence of cardiac aneurysm the patient can continue his activities without danger, provided there are no other signs of heart failure At the onset of any signs of failure or—more commonly—the return of effort pain, a rest of 2–3 weeks in bed will often greatly improve the outlook Any evidence of bulging of the heart wall should mean that the patient at *once starts to lead a* very quiet and restful life He should give up business completely and the relatives should be warned of the gravely altered prognosis

One of the risks to which a patient who has had a coronary thrombosis is liable is a second thrombosis In my series, 12 died of their first attack and 7 of their second attack, of the 16 surviving, 4 have had second attacks and weathered them, and one of the 4 is still in active employment in the tropics

It is generally stated that the older patients do better than the younger ones This has not been my experience Where the younger patient survives the infarct and is given an adequate time to develop a collateral circulation he seems to do better, and it is the younger patients who have best stood up to a second thrombosis They have also responded best to treatment by ultra-short wave, which seems to have helped in the development of their collateral circulation

CLINICAL HISTORY OF THE CASES QUOTED

Case number	Males	Sedentary life	Comfortably off	Gall bladder disease	Icterus	Obese	Strain	Alcohol	Smoker	Non smoker	Gout	Husband and wife affected or 2 cases in one house	Bad heredity	Blood-pressure			Died of 1st attack	Died of subsequent attack	Still well, or died of other disease	Previous history of angina
														Raised	Low	Normal				
1	+	+	+				+		+		+	+	+	+					+	+
2		+	+		+					+		+			+			+		
3	+	+	+	+								+				+			+	
4			+	+						+		+		+			+			+
5	+	+	+	+			+					+	+		+				+	+
6			+		+							+	+		+				+	+
7			+	+						+		+	+			+			+	+
8	+	+	+		+	+						+		+			+			+
9		+	+	+						+		+		+			+			
10	+	+	+			+						+		+				+		+
11		+	+	+						+		+				+	+			+
12			+	+								+	+	+					+	+
13		+	+	+								+	+	+					+	+
14	+		+	+											+				+	
15	+		+	+					+					+					+	+
16	+		+	+											+			+		+
17	+	+	+			+	+		+						+				+	
18	+	+	+				+			+						+			+	
19	+	+	+				+								+				+	+
20			+	+						+				+				+		+
21	+	+	+	+										+			+			+
22				+						+					+		+			+
23		+	+	+		+								+				+		+
24	+	+	+	+						+					+		+			
25		+			+											+	+			
26	+	+								+					+		+			
27	+	+	+		+									+				+		+
28	+				+											+			+	+
29				+		+				+				+				+		
30	+		+					+								+	+			
31				+						+						+			+	+
32	+										+				+		+			
33	+	+	+	+			+									+			+	
34		+								+				+					+	+
35	+			+		+										+	+			
	20	20	26	20	6	6	6	1	3	13	2	13	6	14	10	11	12	7	16	21

When the patient has made a satisfactory *recovery* from the infarct, his commonest danger is respiratory infection, especially influenza Quite a mild attack will put these patients back in their exercise tolerance, and it *is some* time before they completely recover their previous condition If they get a rise of temperature they should stay in bed for at least twice as long as other people Not only *respiratory* but any acute infection is a grave risk for them The impaired heart may be further damaged, even if it survives the complication In view of this I prescribe during the winter a course of vitamins A and D, and when possible give patients a course of ultraviolet light as soon as the effects of sun deprivation appear usually in January cardiogram when possible, in order to estimate the state of the cardiac musculature and to have a record for comparison later. Any factors predisposing to thrombosis are rectified as far as possible The patient should begin treatment with a complete rest of say 2–3 weeks in bed, and should then be allowed to resume his previous activities gradually He is advised to discover his exercise-tolerance limit and to live within this, he is told of the ill effects of worry and heavy meals, and of doing too much in cold weather, and is specially warned against going out in cold weather immediately after a heavy breakfast

Since many patients have a raised blood-pressure I prescribe a diet low in red meats and meat extracts, and as they are also in many cases nervous about their condition I give them tabellæ phenobarbitoni et theobrominæ (*BPC*), one morning and evening Under this regime they often lose their effort pain completely, but even if they do they might get a severe anginal pain at some time, so I advise them always to carry some tablets of nitroglycerin, gr $\frac{1}{100}$, preferably put up in a chocolate base. They should rest and chew one of the tablets slowly, and only resume activity when the pain has completely gone I warn them that a pain of the same type occurring at night, when they are at rest, may be of a different nature, and tell them that if this occurs they should not take their tablet but should send for the doctor There is danger that a patient who has had angina of effort may develop a coronary thrombosis, and by taking a number of tablets in an attempt to ease his pain may reduce his blood-pressure still further, accentuating the fall produced by the infarct I have used ultra-short-wave therapy with success in these pre-thrombosis cases many of whom get fewer attacks after a course of this treatment In some cases iodine has been of use, given in the form of liquor iodi mitis, min 5, in a teaspoonful of milk, three times a day after food So treated these patients can carry on very well and lead fairly normal and reasonably active lives Those who do not get rid of attacks with this routine must cut down their activities and rearrange their lives so that they have less strain Retirement, or better still partial retirement, from business may be necessary for some

With those who develop a coronary thrombosis, however, the doctor has to think of the future at four distances of the immediate future with its treatment of the profound shock, of an adequate period of rest to allow of the development of a collateral circulation, of convalescence, followed where possible by rehabilitation, and, further off still, of the period of maintenance

At the onset of an attack complete rest is essential, and it cannot be obtained without morphine to allay the pain, I have found less than gr ½ useless, and this dose should be repeated as often as is necessary to relieve pain It also helps to combat the shock which is always present If the patient survives the infarct, there is danger of rupture of the softened ventricle during the first 10 days He must make no effort whatever The bowels may well be left for several days unless causing discomfort, when an enema should be given Some give digitalis at this stage, but I have not found it of value where there has been no disturbance of rhythm Moisture is found at the bases of the lungs after thrombosis, but digitalis does not help to clear this up unless cardiac rhythm is disorganised, when it acts through its effect on the heart rhythm A rest of 6–8 weeks in bed will allow a collateral circulation to develop, and during this time the patient must not be allowed to become depressed about himself Before he is due to get up a course of gentle massage to the limbs and some flat-foot exercises are beneficial During the rest period the diet should be arranged so that when the patient gets up his weight will be slightly less than normal for his height and age I give fresh fruit a prominent place in the diet, because its content of vitamin C is specially indicated in any condition affecting the smaller blood-vessels, and its caloric value is low. Adequate amounts of vitamin B should also be included in the diet I have not been able to assess vitamin-B deficiency by chemical tests, but find that the vitamin (' Tab Vitamin B_1,' BDH), in doses of 5 mg per day by mouth, is helpful even when the diet appears to contain an adequate amount In the case of vitamin C, 5000 international units (' Tab Ascorbic Acid,' BDH) daily seems to accelerate improvement, even when an examination of the urine shows what is generally accepted as an adequate amount of the vitamin already present in the circulation I have tried the effects of these vitamins given separately, but have not noticed anything like the same improvement as when they are given together An excess of both seems to be required to improve the circulation and muscle tone of the heart Diuresis and improvement in sleep seen in patients taking these vitamins also favour recovery

In getting the patient up it is important to begin slowly. After he has been up in his room for about 7–14 days he can start going out, beginning with short walks down a mild gradient, which get him gradually fitter and accustomed to exercise, and do not put any strain on the heart As progress is made he is allowed to walk on the flat, and, when some muscle tone has developed, walking up gentle inclines is gradually introduced He is told to rest as soon as he gets tired, feels short of breath or weak, any suggestion of effort pain should limit the amount done, but this will take longer to come on if he begins his convalescence with plenty of downhill walking, before he tries walking on the flat or uphill One of my patients whose heart was rather seriously damaged derived great pleasure from walks down hill, even of some length, and it was surprising how much he increased his exercise tolerance in this way He kept relatively fit and lived for a number of years as a useful member of the community Discussion about retirement from business should if possible be postponed for at least six months, because it is often impossible to gauge accurately the full amount of recovery which will eventually take place The patient may be able to return to work in a modified way, and where this is possible I think that it is wise to let him do it, especially if the work is congenial and the patient sensible It will save him from having too much time for introspection and worry, and will make his modified way of living more tolerable. If, at the end of 6–8 months, it is obvious that he will not be able to return to work he should be induced to take up a light handicraft such as woodwork or carving, model making, painting or even needlework Such hobbies supply an outlet for the creative energies which the patient is otherwise unable to use

On resuming his work he should at first do very short hours, and rest at once if there is any sign of fatigue He should retire to bed early, only increasing the length of the day as he gets fitter One day a week should be a rest day, mostly spent in bed If a satisfactory recovery has been made from the infarct and the area of the heart damaged is not too great, he should be encouraged to look forward to moderate activity He must be prepared to recognise fatigue at once, and to stop what he is doing and take a rest, he should never hurry or work against the clock He will find that by careful management of his exercise tolerance he will gradually be able to work for longer periods He may find that his general musculature can do more without fatigue than his heart musculature He gets warning of this special fatigue in the form of effort pain, sense of constriction about the chest, or sudden inability to do anything more (angina sine dolore) Some cases get angina apart from effort This type of pain generally comes on when the patient first goes out in the cold in the morning It is not a fatigue pain and is probably due to a reflex spasm of the coronary circulation He can avoid it to some extent by having his breakfast at least an hour before he intends to leave the house After breakfast he should rest and read his newspaper for about half an hour, and then he should move about the house for a little time before he goes out His collateral circulation gets warmed up, and he can often start the day even in the winter without discomfort Should this fail the patient ought to chew half a nitroglycerin tablet before going out and take the second half later if necessary Again, the pain may come on only at the beginning of exercise or when it is increased, and this not necessarily in cold weather The patient notices that if he persists in the effort in a modified way his pain gradually goes, and he can do more without a recurrence This may be due to a poorly developed collateral circulation which requires work to dilate it sufficiently to meet of phosgene outside the process-room six hours before. He was delirious, like case 1, but his flushed face was pink rather than grey. His temperature was 103·2° F., pulse-rate 120 and respirations 28. He had a noisy, dry, shallow cough which obviously caused retrosternal pain, for he repeatedly pressed his sternum with his hands. The breath sounds were harsh, with diffuse, coarse rhonchi and râles and prolonged expiratory sounds. There was no smell of phosgene in the breath. The spleen was not palpable. He was kept in the reception-room under a heat cradle, and was given continuous oxygen with a B.L.B. mask and a sedative. The B.L.B. mask seemed to be making him restless and after four hours it was replaced by a Schimmelbusch mask and a catheter. He was given another dose of sedative and then became quieter. He was very thirsty and this was met by glucose drinks. Antiphlogistine was liberally applied to the chest and back and syr. cocillana co. was given when opportunity arose. The pulmonary condition was obviously not so severe as in case 1, but he was kept in the reception-room and given oxygen as continuously as possible. In a lucid moment he complained of the sensation of a ticking clock when the rate was 6 litres per min., and it was consequently reduced, to be increased to 8 litres per min. again when he became more restful. At the end of 8 hours his pulse rate had risen alarmingly to 160 per min., whereas in case 1 the pulse had begun to settle down within 6 hours. He was moved to the ward after 12 hours, and during this time and for the next 12 hours his temperature and pulse rate remained high and the troublesome cough continued. A blood count on the day of admission showed a moderate polymorph leucocytosis but no lymphopenia (see table). A radiogram of the chest on Sept. 24 showed only some generalised fibrosis of the roots and slightly increased density of the root shadows due to simple congestive changes. Cough was present for 7 days, but it steadily diminished in harshness, frequency and severity, at no time did it change to the moist stage found in case 1, and no signs of pulmonary œdema developed. Recovery was uneventful. A radiogram on Oct. 2 showed normal lungs, except for slight peribronchial fibrosis at the roots. He was discharged on Oct. 11, 19 days after admission, with no symptoms or abnormal signs of the chest.

DISCUSSION

Neither of these patients had any memory of the actual contact with the gas, and both had a partial amnesia for the first 24 hours in hospital. Both had a moderate polymorph leucocytosis at the beginning, which is in keeping with the inflammatory reaction in their respiratory tracts, but in case 1 there was a definite fall in the lymphocyte count in the early stages. Case 1 demonstrated that even when there is much pulmonary œdema recovery may be rapid and complete. In such cases the main points in treatment seem to be as follows:

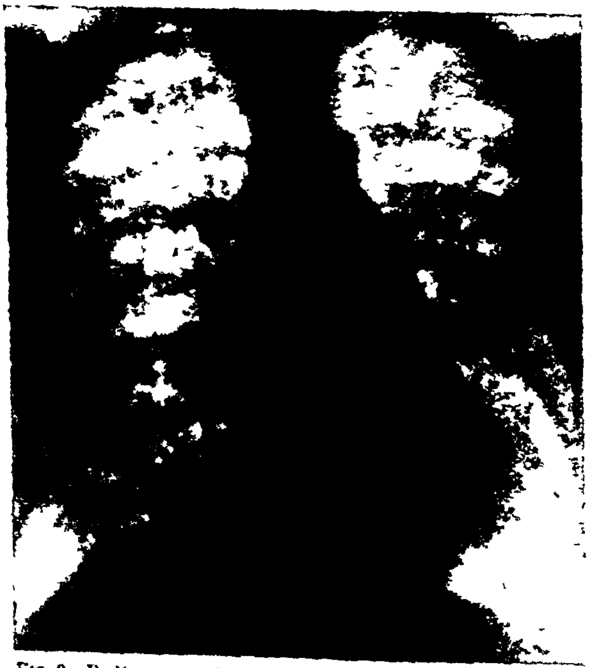


Fig. 2—Radiogram of chest in case 1 on second day after exposure to phosgene. Both lungs obscured by diffuse patchy mottling, with much increased root density. Suggests diffuse pulmonary œdema.

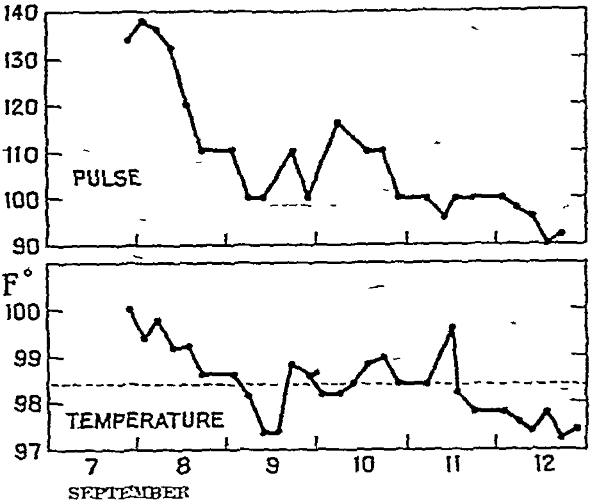


Fig. 1—Four hourly chart in case 1.

(a) *Complete rest.*—This implies that the patient should not be moved from bed to bed or ward to ward until the initial symptoms have begun to subside.

(b) *Oxygen* should be given continuously at first and then diminished gradually. The gas is likely to produce swelling of the nasal mucous membrane so that a purely nasal mask is unsuitable. A rebreathing bag seems to be inadvisable because the irritant gas may be expelled into it.

(c) *Heat.*—The radiant-heat cradle is of considerable value, but care must be taken to see that perspiration does not become excessive. An antiphlogistine poultice is soothing when there is pain.

(d) *Fluids.*—Glucose and other nutritious fluids should be given freely.

(e) *Sedative cough mixtures* ease the distressing cough.

(f) *Infection* of the injured bronchial and pulmonary tissues must be guarded against. To ensure this we nursed each case in isolation and all members of the staff approaching the bed wore masks.

These two patients showed symptoms which are not regarded as characteristic of exposure to the gas. The amnesia and rise of temperature are not often found unless there is a secondary infection, while the leucocytosis also suggests an infection. It is said that animal experiments have proved that prolonged exposure to minute traces of phosgene produces fibrotic changes in the lungs, with consequent greater liability to secondary infection. The two cases had definitely been submitted to concentrations which had hitherto been considered innocuous but which the experiments suggest are sufficient to cause fibrosis and favour secondary infection in the lungs. It seems that any sudden rise of temperature must be a contra-indication to early movement of the patient.

SUMMARY

Two cases of accidental phosgene poisoning are reported, one severe and the other mild. Both patients became rapidly delirious, with fever and rapid pulse and respirations, and a painful cough, soon after exposure. In the severe case pulmonary œdema developed 24 hours after exposure; the other showed only acute bronchitis.

Treatment is by rest, oxygen, general heat with poultices to the chest, free fluids, sedative cough mixtures and strict measures to prevent secondary infection by the attendants.

Both patients improved rapidly after the first 48 hours and there were no symptoms or abnormal physical signs on their discharge from hospital.

SUMMARY

A series of 35 cases (20 in men and 15 in women) of coronary thrombosis is reported and their management in general practice is discussed under the headings of prevention, treatment and prognosis

As regards prevention, liver function should be maintained and infection in the biliary passages should be thoroughly treated in patients approaching middle age or with a family history of cardiovascular disease Other foci of sepsis should also be eliminated Adequate exercise is needed to maintain the general tone of the body, heart and liver Patients should avoid rich fatty foods Those subjected to continued strain should take adequate holidays, and excess in alcohol or tobacco should be avoided Patients complaining of rheumatism, pains in the chest or indigestion, especially in middle age, should be asked whether the pain is related to exercise

In patients with cardiac ischæmia, predisposing factors should be eliminated as far as possible Those who have had a coronary thrombosis should be treated for primary shock and afterwards remain in bed for several weeks before passing to carefully supervised convalescence They should be taught to live within the heart's strength and to avoid heavy meals and doing too much in cold weather They should keep their weight slightly below average and carry tablets of nitroglycerin to chew at the onset of pain By graduated exercise they should gradually get fit, when exercise within the heart's strength will be beneficial and they can return to modified work Diet should be plain, designed to keep down the patient's weight and rich in vitamins B and C which should also be given as concentrates from time to time Ultra-short-wave therapy helps to develop collateral circulation in the heart and to increase exercise tolerance In cases of cardiac ischæmia where there has been no coronary thrombosis it is often possible to avoid or delay its onset by proper management, and in any case it is possible to prolong life

When thrombosis occurred, a third of the cases died in the first few days In those who survived the outlook was relatively good provided the heart was not overloaded In this series, 11 patients had second attacks of thrombosis and 4 of these recovered Patients who have survived coronary thrombosis run a serious risk of further damage to the heart from acute infections, especially influenza

---

PHOSGENE POISONING

REPORT ON TWO CASES

JOHN P STEEL, M D EDIN
MEDICAL SUPERINTENDENT OF A MUNICIPAL HOSPITAL

Two cases of exposure to low concentrations of phosgene were admitted to this hospital within a few weeks, one presenting signs of severe and the other of mild intoxication

CASE 1

A woman, aged 36, who had been working in contact with the gas for a week On Sept 6, 1941, she arrived at the factory at 9 P M although she had been feeling rather seedy and suffering from slight headache and nausea Early in the shift she was exposed to a fairly low concentration of phosgene, one other woman being with her at the time They were both rested and her companion returned to work shortly and showed no further symptoms The patient, however, was sufficiently ill to be kept in the ambulance room all night on continuous oxygen At about 7 A M next morning she was apparently quite well and had a cup of tea, after which she collapsed and her temperature was found to be 101 6° F with pulse rate 124 and respirations 36 She was sent to hospital

On admission to hospital on Sept 7 her temperature was 102 4° F, pulse rate 128, and respirations 28 (fig 1) and she showed well-marked grey-blue cyanosis and dyspnœa She was only semiconscious and presented the appearance of an extreme toxæmia, but there was neither œdema nor jaundice A frequent harsh cough evidently caused her much pain The chest showed diminished movement and shallow respirations with relative dullness at both bases The breath sounds were harsh and coarse rhonchi and râles resembling friction sounds were audible and palpable all over the chest wall The heart beat was rapid, forcible and regular, the blood-pressure was 140/85 mm Hg, and there was no engorgement of the jugular veins The pupils were rather dilated but reacted to light and accommodation, and no abnormal signs were found in the central nervous system The tongue was dry and furred and the fauces were injected, but there was no smell of phosgene in the breath, possibly because of the comparatively short exposure, but probably because of the continuous oxygen given The urine contained a trace of albumin and crystals of calcium oxalate In view of the history and the patient's collapsed state she was not taken to a general ward but was treated with continuous oxygen in the semirecumbent position in the reception ward. All unessential movements were prevented Oxygen was administered by a B L B mask, and the rate of flow was varied from 8 to 4 litres per min, this somewhat high rate being required because the patient was a mouth breather while the mask was suited mainly to nasal breathing She was never more than semiconscious for the first 24 hours but could take glucose in considerable quantities Syr cocillana co was prescribed and heat was continuously applied by means of a cradle, care being taken to obviate overheating, and the skin reacted well At the end of 6 hours the oxygen was stopped for 5 min every hour, the rate being maintained at 6 litres per min Her temperature had by then risen to 103° F, the pulse was slower, and the respirations were laboured (30 per min) Twelve hours after admission she was much the same, the cyanosis and dyspnœa had not improved, and in the chest harsh bruits were still both audible and palpable A blood count (see table) showed a polymorph leucocytosis and an absolute lymphopenia, with 7% eosinophils The heart beat remained strong and the blood pressure had not altered Oxygen was continued throughout the night of Sept 7–8 In an attempt to overcome the somewhat severe pain 'Antiphlogistine' was applied to the whole of the chest and back The dilatation of the pupils gradually decreased as the cyanosis became less

BLOOD COUNTS

	Case 1 (severe)		Case 2 (mild)	
	On admission	On discharge	On admission	On discharge
Red cells (per c mm)	5,060,000	5,080,000	5,080,000	5,100,000
Hæmoglobin (%)	91	90	93	95
White cells (per c mm)	18,000	12,000	12,000	8000
Polymorphs	15,840 (88%)	9000 (75%)	9120 (76%)	5440 (68%)
Lymphocytes	720 (4%)	2040 (17%)	2160 (18%)	1920 (24%)
Monocytes	180 (1%)	360 (3%)	360 (3%)	240 (3%)
Eosinophils	1260 (7%)	600 (5%)	360 (3%)	400 (5%)

In the morning of Sept 8 (24 hours after admission) her respirations were much slower and less distressing The cyanosis had almost disappeared but the lungs now showed signs of pulmonary œdema and acute bronchitis with various types of rhonchi and numerous fine râles diffusely scattered throughout both lungs A radiogram (fig 2) showed diffuse, patchy mottling of both lung fields and greatly increased root density, slight general cardiac enlargement As œdema of the lungs developed the cough became less racking and less frequent but deeper and accompanied by frothy and mucoid expectoration The spleen was palpable and firm, its edge being about 1½ in below the costal margin Oxygen was given in diminishing concentration and with longer intervals, and the patient rapidly improved The oxygen was discontinued 48 hours after her admission In a radiogram on the 15th the signs of pulmonary œdema had nearly disappeared but there was still increased density of the root shadows On the 17th this increased density was hardly noticeable and the rest of the lung fields was clear She was discharged on Sept 19, 11 days after admission On that day there was still a slight polymorph leucocytosis, but the number of lymphocytes had risen to normal She then had no symptoms, and when she attended for examination on Oct 1 she had no cough and there were no abnormal physical signs, the lungs appeared radiologically normal

CASE 2

A man, aged 24, was admitted on Sept 22, 1941, with a history of having been exposed to a very small concentration of phosgene outside the process-room six hours before He was delirious, like case 1, but his flushed face was pink rather than grey His temperature was 103 2° F., pulse-rate 120 and respirations 28 He had a noisy, dry, shallow cough which obviously caused retrosternal pain, for he repeatedly pressed his sternum with his hands The breath-sounds were harsh, with diffuse, coarse rhonchi and râles and prolonged expiratory sounds There was no smell of phosgene in the breath The spleen was not palpable He was kept in the reception-room under a heat cradle, and was given continuous oxygen with a B.L.B mask and a sedative The B.L.B mask seemed to be making him restless and after four hours it was replaced by a Schimmelbusch mask and a catheter He was given another dose of sedative and then became quieter He was very thirsty and this was met by glucose drinks Antiphlogistine was liberally applied to the chest and back and syr cocillana co was given when opportunity arose The pulmonary condition was obviously not so severe as in case 1, but he was kept in the reception-room and given oxygen as continuously as possible In a lucid moment he complained of the sensation of a ticking clock when the rate was 6 litres per min, and it was consequently reduced, to be increased to 8 litres per min again when he became more restful At the end of 8 hours his pulse rate had risen alarmingly to 160 per min, whereas in case 1 the pulse had begun to settle down within 6 hours He was moved to the ward after 12 hours, and during this time and for the next 12 hours his temperature and pulse rate remained high and the troublesome cough continued A blood count on the day of admission showed a moderate polymorph leucocytosis but no lymphopenia (see table) A radiogram of the chest on Sept 24 showed only some generalised fibrosis of the roots and slightly increased density of the root shadows due to simple congestive changes Cough was present for 7 days, but it steadily diminished in harshness, frequency and severity; at no time did it change to the moist stage found in case 1, and no signs of pulmonary œdema developed Recovery was uneventful A radiogram on Oct 2 showed normal lungs, except for slight peribronchial fibrosis at the roots He was discharged on Oct 11, 19 days after admission, with no symptoms or abnormal signs of the chest

DISCUSSION

Neither of these patients had any memory of the actual contact with the gas, and both had a partial amnesia for the first 24 hours in hospital Both had a moderate polymorph leucocytosis at the beginning, which is in keeping with the inflammatory reaction in their respiratory tracts, but in case 1 there was a definite fall in the lymphocyte count in the early stages Case 1 demonstrated that even when there is much pulmonary œdema recovery may be rapid and complete In such cases the main points in treatment seem to be as follows

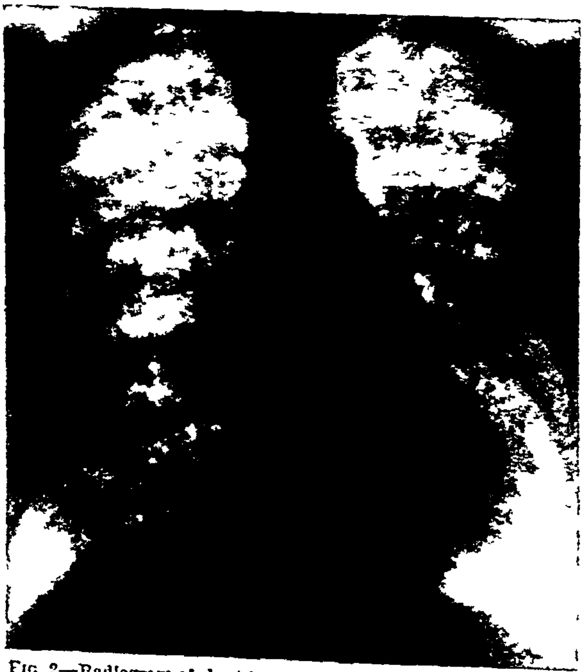


FIG 2—Radiogram of chest in case 1 on second day after exposure to phosgene Both lungs obscured by diffuse patchy mottling with much increased root density Suggests diffuse pulmonary œdema.

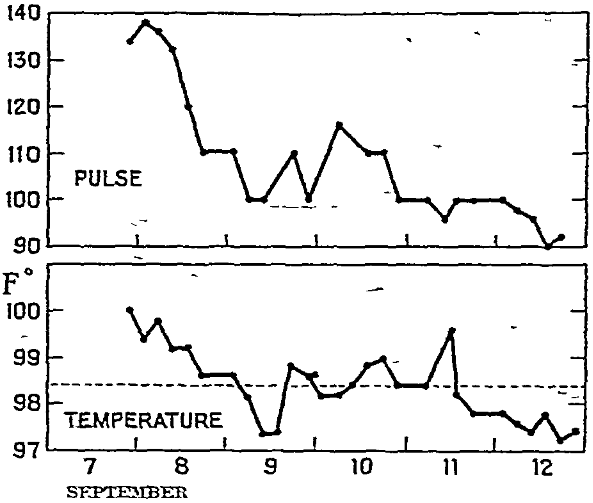


FIG 1—Four hourly chart in case 1

(a) *Complete rest*—This implies that the patient should not be moved from bed to bed or ward to ward until the initial symptoms have begun to subside

(b) *Oxygen* should be given continuously at first and then diminished gradually The gas is likely to produce swelling of the nasal mucous membrane so that a purely nasal mask is unsuitable A rebreathing bag seems to be inadvisable because the irritant gas may be expelled into it

(c) *Heat*—The radiant-heat cradle is of considerable value, but care must be taken to see that perspiration does not become excessive An antiphlogistine poultice is soothing when there is pain

(d) *Fluids*—Glucose and other nutritious fluids should be given freely

(e) *Sedative cough mixtures* ease the distressing cough

(f) *Infection* of the injured bronchial and pulmonary tissues must be guarded against To ensure this we nursed each case in isolation and all members of the staff approaching the bed wore masks

These two patients showed symptoms which are not regarded as characteristic of exposure to the gas The amnesia and rise of temperature are not often found unless there is a secondary infection, while the leucocytosis also suggests an infection It is said that animal experiments have proved that prolonged exposure to minute traces of phosgene produces fibrotic changes in the lungs, with consequent greater liability to secondary infection The two cases had definitely been submitted to concentrations which had hitherto been considered innocuous, but which the experiments suggest are sufficient to cause fibrosis and favour secondary infection in the lungs It seems that any sudden rise of temperature must be a contra-indication to early movement of the patient

SUMMARY

Two cases of accidental phosgene poisoning are reported one severe and the other mild Both patients became rapidly delirious with fever and rapid pulse and respirations and a painful cough, soon after exposure. In the severe case pulmonary œdema developed 24 hours after exposure the other showed only acute bronchitis

Treatment is by rest oxygen general heat with poultices to the chest free fluids sedative cough mixtures and strict measures to prevent secondary infection by the attendants

Both patients improved rapidly after the first 48 hours and there were no symptoms or abnormal physical signs on their discharge from hospital

HYPOPROTHROMBINÆMIA
PRODUCED BY
METHYLENE-BIS-(HYDROXYCOUMARIN)
ITS USE IN THROMBOSIS *

JORGEN LEHMANN, M D
CHIEF OF THE CENTRAL LABORATORY, SAHLGRENSKA HOSPITAL, GOTHENBURG, SWEDEN

EXPERIMENTS have been conducted to find substances able to produce hypoprothrombinæmia with a view to preventing postoperative thrombosis or to benefiting established thrombosis Since prothrombin is synthetised in the liver—in the presence of vitamin K—one or more enzymes can be assumed to be concerned in this process By analogy with the poisoning action of malonic acid on the oxidation of the closely related succinic acid, attempts were made to find naphthoquinone derivatives able to produce a specific inhibition of the formation of prothrombin through a competitive action on the vitamin K in the liver Several naphthoquinone derivatives were tried without success Following the papers of Quick (1937), Schofield (1922, 1924), and Roderick (1929) on a toxic agent in spoiled sweet clover (*Melilotus albus*) that produced hypoprothrombinæmia in cattle and rabbits, we tried to isolate this toxic agent in August, 1940 Later K P Link and co-workers (Campbell et al 1940, Stahman et al 1941) reported studies on this substance leading to its isolation, identification, and synthesis, it is 3,3′-methylene-bis-(4-hydroxycoumarin) (fig 1) We therefore continued our experiments with this substance, kindly synthetised by Ferrosan Company, of Malmo, Sweden Reports have since been made by Butt and others (1941) and Bingham and others (1941)

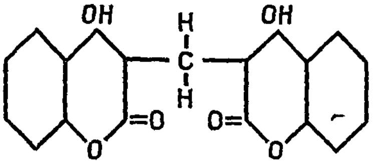


FIG 1—3,3′ methylene bis (4 hydroxy-coumarin)

Extensive experiments on rabbits showed that the substance—here called "AP" (anti-prothrombin)—produced a reproducible and reversible hypoprothrombinæmia, the prothrombin index (Quick) being lowered to 10–20 for 1–2 days by a single dose by mouth of 3–4 mg AP per kg Keeping the prothrombin index at 10–40 for a month did not act deleteriously on the restoration of normal prothrombin values after the AP treatment

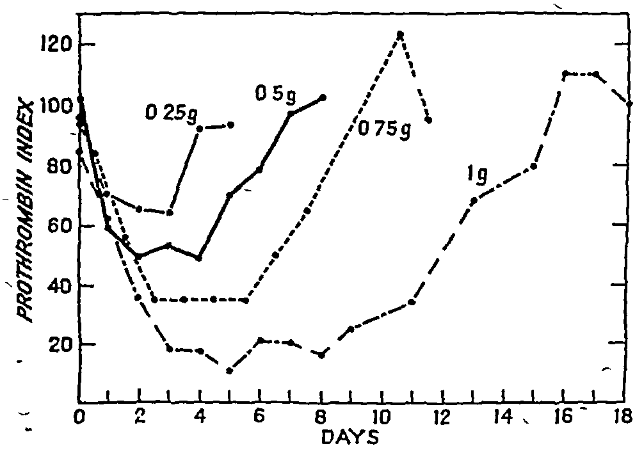


FIG 2—Effect of various doses of AP in human subjects Dose given by mouth at 0 Prothrombin estimated by author's modification of Quick's method (Lehmann 1941a and b) Normal prothrombin index 100 (per cent of "normal" prothrombin time)

No toxic effect could be observed on circulation, respiration, intestines, liver, kidney, heart, or the composition of the blood The lethal dose was found to be 0 25 g per kg of body-weight (rabbits); the cause of death is as yet not fully explained It can thus be concluded that AP (in non-lethal doses) produces a specific, reversible inhibition of the formation of prothrombin and has little toxic effect

The effect of AP was not antagonised by synthetic vitamin K, but blood-transfusion was able to elevate the prothrombin for 3–5 hours

AP given by mouth in doses of 0 25–1 g to normal human subjects in most cases lowered the index to the values indicated in fig 2. Seventeen cases of thrombosis in the extremities were treated with AP, ten of these showing the picture of phlegmasia alba dolens, when 0 75 g of AP was given to these patients the prothrombin index did not fall to the low values obtained in normal subjects, thus showing a higher prothrombin resistance in these cases When an initial deep fall in prothrombin index to about 20–30 was accomplished, a well marked improvement was often seen, demonstrated by a fall in the temperature, diminished swelling of the leg and subjective amelioration (fig 3)

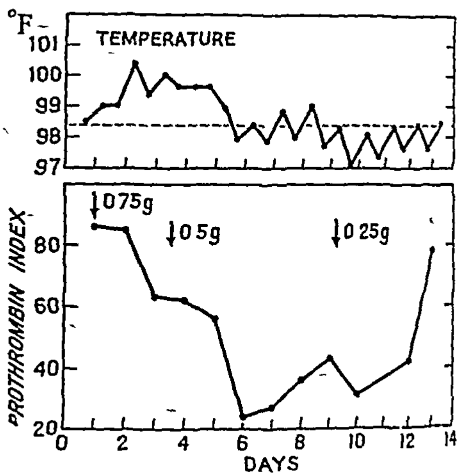


FIG 3—Effect of AP in a patient with phlegmasia alba dolens

The cases of phlegmasia were more resistant than cases of thrombosis localised to only a part of the leg (thrombosis anticruris) The latter all ran a course that could be considered shorter than without treatment In no cases did the thrombosis spread after the fall in prothrombin, but in two cases there was a spread before the fall in prothrombin

The following conditions have so far been considered as a contra-indication to AP treatment—kidney disease, heart disease (especially cardiosclerosis), hypertonia, liver disease, bleeding in pregnancy and the puerperium and due to other causes Suspected or diagnosed deficiency in ascorbic acid should be effectively treated at the same time as AP is given, to prevent hæmorrhages The use of AP in the prevention of postoperative thrombosis is under investigation

SUMMARY

A brief report on the use of a synthetic anti-prothrombin is given, the substance is relatively non-toxic and should have useful application in clinical conditions in which it is desirable to depress the coagulability of the blood in vivo

REFERENCES

Bingham J B Meyer, O O and Pohle F J (1941) *Amer J med Sci* 202, 563
Butt H R, Allen, E V and Bollman J L (1941) *Proc Mayo Clin* June 18 p 388
Campbell, H A Smith, W K Roberts, W L and Link, K P (1940) *J biol Chem* 136 47
Lehmann J *Mschr Kinderheil!* (1941a) 86, 44 *Nord Med* (1941b), 12 3192
Quick A J (1937) *Amer J Physiol* 118, 260
Roderick, L M (1929) *J Amer vet Ass* 74 314
Schofield, F S (1922) *Canad vet Rec* 3 74, (1924) *J Amer vet Ass* 64 553
Stahman M A, Huebner C F and Link, K P (1941) *J biol Chem* 138, 513

BORIC ACID LINT —Acting on the advice of the Therapeutic Requirements Committee the Minister of Health has decided to include in the Drug Tariff a new specification for boric acid lint which will be published in the forthcoming supplement to the British Pharmaceutical Codex This lint will contain 5% of boric acid instead of the present 40%, and because of its light weight it will be supplied by area instead of by weight It will become official on April 1

---

* Paper read at the annual meeting of the Swedish Surgical Association in Stockholm, Nov 29, 1941

DIGESTIBILITY OF NATIONAL WHEATMEAL

H A KREBS
M D HAMBURG, M A CAMB
DEPARTMENT OF BIOCHEMISTRY, UNIVERSITY OF SHEFFIELD

KENNETH MELLANBY
PH D LOND
SORBY RESEARCH FELLOW OF THE ROYAL SOCIETY

N. C Wright (1941) has recently expressed the opinion "that the adoption of the wheatmeal loaf would not result in any appreciable saving in the energy content of the nation's dietary, while it would cause a significant reduction in both the quantity and the quality of protein available for human consumption" Wright argues that a large portion of the extra flour obtained by raising the level of extraction in national wheatmeal from 75 to 85% cannot be digested and is therefore lost, were the extra flour fed to dairy cattle part of it could be converted into milk His calculations are based on various assumptions, the validity of which has been discussed in detail by Bacharach (1941) Some of the most significant assumptions are those concerning the "digestibility," or utilisation, of flour Wright uses the following data in his calculations

Extraction of wheat	Utilisation Protein	Utilisation Calories
%	%	%
75 (white flour)	89	92
85 (national wheatmeal)	81	87

Wright's figures are derived from data published by the U S Department of Agriculture about 40 years ago and reviewed by Hamill in 1909 They apply to 70% and 80% extraction flours Wright claims that these figures had received confirmation by Wood (1911) In fact Wood gives the following results which were obtained in experiments on four volunteers (see Newman et al 1912)

Extraction of wheat	Utilisation Protein	Utilisation Calories
%	%	%
70 or less	89	96
80	86	95

It will be seen that the differences between the two flours are much smaller than those quoted by Wright

No experimental data have so far been published on the digestibility of national wheatmeal To fill this gap, the experiments reported in this paper were undertaken The first set of observations was recorded in the course of an experiment carried out at the suggestion of Dr R A McCance, of Cambridge, with the object of studying the effect of national wheatmeal on human calcium requirements The results on the calcium metabolism will be reported elsewhere Six volunteers were available for the experiments They were men of military age who had been put on the register of conscientious objectors and who had originally volunteered for experiments on scabies These were conducted concurrently with the dietary experiments (Mellanby 1941) The men lived under controlled institutional conditions, they conscientiously observed all their instructions regarding the diet and the collection of the excreta

The diet was a mixed one containing about 4000 calories per day including 700–900 grammes of bread Fæces and aliquot samples of food were analysed in weekly periods, 0 7 g of carmine was used for marking the fæces

A sample of the national wheatmeal was analysed in the laboratory of the Research Association of British Flour Millers, it contained 0 45% fibre, 0 82% ash, and 1 international unit of vitamin B_1 per gramme The "white" flour used in the control period came from a different grist and was of 75% extraction About 90% of the flour was eaten in the form of bread, the rest in the form of puddings, sauces and cakes In order to make the large quantity of bread palatable it was necessary to supply an extra jam ration of 1 lb per head per week The experimental periods were preceded by preliminary periods of one week during which the diet was the same as in the experimental periods

"Digestibility" in this paper is defined as the value of

$$\left(1 - \frac{\text{amount of food residue in fæces}}{\text{amount of food ingested}}\right) \times 100$$

The figure for digestibility indicates the percentage of the food disappearing during the passage through the digestive tract "Digested" food is not necessarily identical with food utilised by the body, for the former includes substances absorbed by the gut and excreted by the urine, and also material utilised by the bacteria of the gut

RESULTS

Table I shows data on the dry weights of the fæces and of the flour eaten In every case, as may be expected, national wheatmeal produced a larger amount of fæces than did white flour, the average weekly quantity being 294 g with national wheatmeal and 177 g with white flour On average the dry weight of the fæces amounted to 7 5% of the dry weight of flour consumed during the wheatmeal periods and to 4 6% during the white flour periods It follows that of the dry matter of national wheatmeal at least 92 5% and of white flour at least 95 4% were digested These figures are minimum figures, based on the obviously incorrect assumption that all the dry matter of the fæces was derived from flour The actual digestibility was thus higher than the figures indicate

TABLE I—DRY WEIGHT OF FÆCES IN RELATION TO FLOUR INTAKE

Subject	Age (yr)	Weight (kg)	Week ending	Flour intake: Milling standard (extraction)	Flour intake: Weekly quantity (g), dry weight	Total fæces weekly quantity (g), dry weight	Dry weight of fæces as % of dry weight of flour eaten: Weekly	Dry weight of fæces as % of dry weight of flour eaten: Av	"Minimum" digestibility of flour
				(%)					(%)
1	27	67 5	Sept 16	85	5050	356	7	7 3	92 7
			,, 23	,,	4970	375	7 5		
			Oct 7	75	4050	118	2 9	3 6	96 4
			,, 14	,,	4320	183	4 2		
			,, 21	,,	4290	206	4 8		
2	31	64 4	Aug 29	85	4200	321	7 6	6 9	93 1
			Sept 12	,,	4090	286	7		
			,, 19	,,	3880	240	6 2		
			Oct 3	75	3715	169	4 6	4 6	95 4
			,, 10	,,	3990	209	5 2		
			,, 17	,,	3800	116	3		
			,, 24	,,	3065	166	5 4		
3	30	57 6	Aug 29	85	3770	296	7 9	7 3	92 7
			Sept 12	,,	3910	269	6 9		
			,, 19	,,	3885	276	7 1		
			Oct 3	75	4650	172	3 7	4	96
			,, 10	,,	4300	179	4 2		
			,, 17	,,	4005	155	3 9		
			,, 24	,,	4150	171	4 1		
4	20	63 5	Aug 29	85	3930	220	5 6	7 6	92 4
			Sept 12	,,	3800	324	8 5		
			,, 19	,,	3520	304	8 6		
			Oct 3	75	3230	223	6 9	5 3	94 7
			,, 10	,,	3515	162	4 6		
			,, 17	,,	3200	157	4 9		
			,, 24	,,	3460	172	5		
5	30	55 4	Sept 16	85	3840	315	8	8 4	91 6
			,, 23	,,	3415	301	8 8		
			Oct 7	75	3845	462	12	6 7	93 3
			,, 14	,,	3835	215	5 9		
			,, 21	,,	3580	120	3 3		
6	23	53 5	Sept 4	85	3310	262	7 9	7 5	92 5
			,, 23	,,	3380	243	7 2		
			Oct 7	75	3915	61	1 6	3 4	96 6
			,, 14	,,	3480	124	3 6		
			,, 21	,,	3170	165	5 2		

The digestibility of dry matter might be regarded as of less interest than the digestibility of calories It was impracticable, however, to determine directly the calorific value of food and fæces in a bomb calorimeter and we have therefore no direct measurements of the digestibility of calories But an approximate estimate of the utilisation of calories can be made from the fact that in the case of flour (a food containing little fat) the utilisation of calories is almost the same as the digestibility of dry matter That this is so is shown in the following table calculated from data published by Newman and others (1912)

Extraction of wheat	Av digestibility of dry matter	Av utilisation of calories *
%	%	%
70 or less	96 8	96
80	94 8	94 6
88	88 8	90
92	88 5	88 9

* Utilised calories = calories ingested minus calories excreted in fæces and urine

TABLE II—DIGESTIBILITY OF WHEATMEAL

Subject	Period (week)	Food				Fæces		Digested (%)		Digestibility of wheatmeal (%)				Actual average digestibility (%)	
		Dry weight (g)		Nitrogen (g)		Dry weight (g)	Nitrogen (g)	Total dry matter	Total nitrogen	"Minimum"		Actual		Dry matter	Nitrogen
		Total	Wheat meal	Total	Wheat meal					Dry matter (energy)	Nitrogen	Dry matter (energy)	Nitrogen		
1	1st	2610		78 8		165	11 6	93 7	85 3					94 3	89 4
	2nd	6042	4765	179 6	139 2	442	23	92 7	87 2	90 7	83 5	92 4	87 6		
2	1st	2860		87		178	11 2	93 8	87 1						
	2nd	5578	4070	159 5	119	318	17 6	94 3	89	92 2	85 2	95 5	89 9		
3	1st	2940		86 4		197	12 2	93 3	85 8						
	2nd	6292	4870	186 6	142 5	387	20 9	93 8	88 8	92 1	85 4	94	89 5		
4	1st	3680		74		214	12	94 2	83 7						
	2nd	6275	4480	164	131	312	16 8	95	89 8	93	87 2	95 3	91 6		

From these figures it is justifiable to assume that under the conditions of our experiments digestibility of dry matter and utilisation of calories are approximately equal Our figures for the minimum digestibility of dry matter can thus be taken as representing approximately the minimum utilisation of calories

The six volunteers show remarkably small individual differences It is probable that considerable variations would be found if larger numbers or different types were investigated Age and disease are likely to effect digestibility.

A further set of experiments was carried out to determine more accurately the actual, as distinct from minimum, digestibility of dry matter and also the digestibility of protein Early investigators when determining digestibility have usually given a very restricted diet consisting of the food in question and a few supplementary items such as milk, butter and sugar which were assumed to be completely, or almost completely, digestible Rubner (1918) and later Ferrari (1932) have however shown that the digestibility of a food is affected, and generally improved, by other foodstuffs in the diet For the digestion of a food depends on the quantity and quality of the secretions of the digestive glands and on the speed at which the food travels through the digestive tract These factors in their turn depend on the composition of the food The following procedure was therefore adopted for our experiments

A mixed diet containing no bread was given for the first experimental period of one week The diet consisted of meat, fish, butter, margarine, bacon, cheese, milk, potatoes, vegetables and small quantities of rice and porridge, the only restrictions were those due to rationing The diet supplied, on average, 330 g fat, 500 g protein and 1900 g carbohydrate per week, or 1850 calories per day The quantity of each dish eaten was recorded, and during the second week immediately following the first, the same dishes were served but half the quantities only were eaten In place of the other half an unrestricted quantity of national wheatmeal bread was offered with 1 lb of jam per week, a large bread intake was encouraged The wheatmeal bread used in this experiment contained 2 9 g nitrogen per 100 g dry matter The calorie consumption during the second week was, on average, 3450 calories per day. Dry matter and nitrogen were determined in food and fæces

From the quantity of dry matter (or of nitrogen) in the fæces during period 1 (a_1) and during period 2 (a_2) the quantity of dry matter (or of nitrogen) derived from flour was assumed to be $a_2 - a_1/2$ Even if the basis of this assumption (i e , that the digestion of the mixed diet was proportionally the same for the second period) was not absolutely correct, the resulting error was comparatively small as a_1 was small compared with a_2

The details of the experiments are given in table II The average minimum digestibility (calculated, as before, on the assumption that the fæces were derived entirely from flour) is 92% for dry matter (against 92 5% in the first experiment) and 85 1% for nitrogen The actual digestibility, calculated according to the above formula, is 94 3% for dry matter (or energy) and 89 4% for nitrogen These figures are considerably higher than those used by Wright They are slightly higher than those to be expected, by interpolation, from the figures of Wood (1911) and of Newman and others (1912)

These differences may be partly due to different experimentation Hamill's data are mostly based on two day, three-day or four-day periods and Newman and others have already pointed out that owing to the difficulty of accurately marking the fæces these periods are too short In the experiments of Newman and others, a restricted diet was used and this might have reduced the utilisation of flour It must also be remembered that national wheatmeal is an 85% extraction flour of special quality The differences are thus well explained and do not cast doubt on the present results

Author	Extraction of wheat	Digestibility of protein	Utilisation of calories
	%	%	%
Hamill	80	81	87
Wood , Newman et al	80	89	95
	88	80	90
Present investigation	85	89	94

In connexion with Wright's argument, it is important to know the difference in the digestibility of white (75%) and wheatmeal flour (85%) It follows from table I that the difference in the digestibility of dry matter is 2 9% Thus 71% of the extra fraction gained by raising extraction from 75% to 85% are digestible If the recent figures of Macrae and others which apply to the digestion of energy of 73% and 100% extraction flour are interpolated for 75% and 85%, a difference similar to that calculated from our own experiments is obtained—namely, 3 35%

So far the digestibility of protein has not been determined for 75% extraction flour Macrae and others found 91% for a 73% extraction flour , it must be very similar for 75% extraction flour, and until further experiments have been done Macrae's figures may be accepted as the nearest available for 75% flour The figures thus at hand for the comparison of the two flours are the following

Extraction of wheat	Digestibility of dry matter (or utilisation of calories)	Digestibility of protein
%	%	%
75 (white flour)	97	91
85 (national wheatmeal)	94	89

The main outcome of this work is that the digestibility of both 75% extraction flour and national wheatmeal is much greater, and the differences between the two flours much smaller, than was assumed by Wright If Wright's calculations are revised on the basis of the new data they no longer support the view quoted at the beginning of this paper

SUMMARY

Six adult male volunteers were kept on a diet containing 480–700 g of national wheatmeal or white flour of 75% extraction per day Dry weight and nitrogen content of the fæces were determined

On average 94% of the dry matter and 89% of the nitrogen of national wheatmeal were digested

In the case of white flour of 75% extraction approximately 97% of dry matter was digested It follows from data published by Macrae and others that the digestibility of the white flour nitrogen is approximately 91%

The views put forward by N C Wright against raising the extraction of wheat to 85% (which in the absence of reliable data on the digestibility of the two flours were admittedly provisional), are not substantiated by the

new data The difference in the digestibility of the two flours is much smaller than was assumed by Wright

We are indebted to the Medical Research Council for a grant, to Mr L V Eggleston for technical assistance, and to Dr R A McCance and Miss E M Widdowson, Ph D, of Cambridge, for criticism and advice on many points, especially on the technique of dietary experiments on man

REFERENCES

Bacharach, A L (1941) *Chem and Ind* 60, 791
Ferrari, R (1932) *Pflüg Arch ges Physiol* 230, 215
Hamill, J M (1909) *Local Gov Bd Rep* Cd 5831
Macrae T F, Bacon, J S D, Hutchinson, J C D and McDougall, I (1941) *Chem and Ind* 60 723
Mellanby, K (1941) *Brit med J* ii, 405
Newman, L F, Robinson, G W, Halnan, E T and Neville, H A D (1912) *J Hyg, Camb* 12, 119
Rubner M (1918) *Arch Physiol* 53 and 135
Wood, T B (1911) *J roy agric Soc* 72, 1, (1913) The Story of a Loaf of Bread, Cambridge
Wright, N C (1941) *Chem and Ind* 60, 623

A TELLURITE MEDIUM IN THE DIAGNOSIS OF DYSENTERY

J C SAWLE THOMAS
M R C S, D P M
DEPUTY MEDICAL SUPERINTENDENT

W A HULME
LABORATORY TECHNICIAN

NORTHAMPTONSHIRE COUNTY MENTAL HOSPITAL

A tellurite-iron-rosolic-acid medium was recently described by Wilson and Blair[1] for the isolation of *Bacillus dysenteriæ* Flexner This medium was said to allow the organisms to grow in profusion while inhibiting the growth of *Bacillus coli*, enterococci and organisms of the typhoid group A dysentery epidemic being in progress at this hospital, it was decided to try the effects of the medium The results have been so striking that we thought it desirable, even at this early stage in its use, to publish them

A series of 813 specimens were examined during the weeks from Sept 29 to Nov 28, 1941 Of these, 126 consecutive and unselected specimens were plated on both the tellurite medium and litmus-lactose-agar The specimens came from a few cases of suspected dysentery (diarrhœa with or without blood and mucus) but most of them were from suspected dysentery carriers, including some cases known or suspected to have had dysentery in past years; there were also some cases of recently recovered clinical but unproven dysentery Many of these last cases had been, or were still, under treatment with sulphapyridine and this may partially explain the comparatively small number of positive cultures from them Of the 126 specimens examined, 12 grew colonies of *B dysenteriæ* Flexner on Wilson and Blair's medium but only 4 were positive on litmus-lactose-agar (see table)

—	Wilson and Blair's medium		Litmus lactose agar	
	Pos	Neg	Pos	Neg
Acute diarrhœa with blood and mucus	5	12	3	14
Acute diarrhœa	5	13	1	17
Suspected carriers	2	76	Nil	78
Possible carriers	Nil	13	Nil	13
Total	12	114	4	122

An anomalous result was obtained in one case which yielded a positive growth on the old medium but not on the new, although this result was reversed when cultures were made from the rectal swab The only explanation which can be advanced to cover this odd occurrence is an error in technique The 12 positive cultures were obtained from 5 cases with blood and mucus, 5 who had recently recovered from apparent but unproven clinical dysentery, and 2 possible carriers who had had no clinical symptoms since admission here Further details of these last 2 cases are worth recording

The first was a male patient who was transferred here from another mental hospital in August, 1939 The case notes stated that he had had dysentery in September, 1934, when *B dysenteriæ* Flexner Y was isolated from the fæces The organism was still present three weeks later but 7 cultures taken over the next two years were all negative On admission here the fæces were again cultured on litmus lactose agar and *B coli* only were grown Since the outbreak of dysentery 7 more cultures were made on the same medium, all negative, the third culture on the tellurite medium grew a number of colonies of *B dysenteriæ* Flexner 103

The second patient was sent here at the same time from the same hospital She had a history of ulcerative colitis in 1925 but no specific organism appears to have been isolated The fæces were cultured in 1938 and yielded a growth of *B coli*, no organisms of the enteric group were found Since admission here the fæces have been cultured 7 times on litmus lactose-agar with negative results, the third culture on tellurite gave a profuse growth of Flexner bacilli

These two cases alone, in our opinion, prove the value of this new method of culture, for there can be little doubt that both would otherwise have been missed and might have been responsible for dysentery remaining endemic in the hospital

The remainder of the 813 specimens were not plated in duplicate owing to the difficulty in obtaining supplies of agar, so that no useful purpose would be served by tabulating the full results It may be mentioned, however, that a further carrier has been identified and the impression originally formed that a higher percentage of positive results is obtained on Wilson and Blair's medium is being steadily strengthened

TECHNIQUE

The technique used is that recorded by Wilson and Blair and is as follows

To 100 c cm of melted nutrient agar (pH 7 4), cooled to 60° C, is added 0 5 c cm of 1% alcoholic solution of rosolic acid, 1 c cm of 4% aqueous solution of iron alum and 3 c cm. of lactose tellurite solution (20 g of lactose boiled in 100 c cm of distilled water and cooled, 0 2 g of potassium tellurite is added and dissolved) Plates are poured and allowed to set with lids removed It will be seen that the preparation of the medium is somewhat easier than is that of litmus-lactose agar and that there is less risk of contamination during the process

Rectal swabs were plated directly on the medium but fæces were first emulsified in peptone water and then a large loopful spread over the medium The plates were then dried in the incubator for about 30 min They were not dried on the bench, as recommended by Wilson and Blair, because of the danger of flies settling on them

The colonies of *B dysenteriæ* Flexner were easily recognised and growth in most of the positive cases was profuse Colonies were pinkish and glistening when viewed against the light but against a white background they had a greyish tinge Most of the *B coli* group were inhibited but organisms of the proteus and alkaligenes groups and also some enterococci grew fairly well In most of the acute cases a pure culture of dysentery organisms was obtained Some of the growth was tested by slide agglutination and by stained film and a verbal report was given at this stage The organisms were then put in the usual sugar media and finally proved by agglutination tests All were *B dysenteriæ* Flexner, type 103

* * *

We feel this evidence is sufficient to indicate the value this medium is likely to have in the isolation of suspected cases of dysentery and of carriers This together with the recent introduction of sulphaguanidine as a therapeutic agent[2] should go far towards the elimination of endemic dysentery from mental hospitals and similar institutions

We wish to thank Dr C A Keane, medical superintendent of the Northamptonshire County Mental Hospital, for permission to carry out this investigation

---

[1] Wilson, W J and Blair, E M McV *Brit med J* 1941, ii 501

[2] See Anderson, D E W and Cruickshank R *Ibid*, p 497

GASTRIC DISORDERS IN THE ARMY

J. M. SMELLIE, M.D. EDIN., F.R.C.P.
LIEUT.-COLONEL R.A.M.C.

Payne and Newman's (1940) interim report on dyspepsia in the Army has stimulated interest in this subject and from their figures and others which have been published since it would appear that digestive disorders are a serious problem in the Army. They found that 12.5% of all cases evacuated from the B.E.F. in France had a diagnosis of gastric or duodenal disease. Graham and Kerr (1941) report an incidence of 31.1% from one military hospital in this country and 36% from another but as they point out both these hospitals were used largely for the investigation of such cases. Tidy (1941) states that in August, 1940, the proportion of gastric cases in all military hospitals was 17.3%. At this hospital, where there is no selection of cases for admission, the proportion of dyspeptics has been much lower.

During the 12 months Nov. 1, 1940, to Oct. 31, 1941, 1686 cases were admitted to the medical division, and indigestion in one form or another was the leading complaint in 247 (14%). Of this number, 131 (53%) were found on investigation to be suffering from definite organic gastric or duodenal disease and were invalided from the Service as permanently unfit. The remaining 116 (47%), after investigation and a short course of treatment if necessary, were returned to duty; a small proportion went first to a convalescent home or depot. Thus in the period under review only 7.7% of the total medical cases admitted were found to be suffering from any organic dyspepsia. This figure compares very favourably with that reported from other military sources (Payne and Newman 1940, Graham and Kerr, 1941). The Royal Navy and Royal Air Force are silent on the subject, but of the 47 R.A.F. men who have been treated at this hospital during the year none complained of dyspepsia.

There are a number of possible explanations of this appreciable drop in incidence. Since attention was first focused on these disorders civilian medical boards have exercised an increased vigilance, and thus the number of dyspeptics who have been accepted for military service has been reduced; secondly, more and more of those who got into the Army in the early months of the war have been invalided out; and thirdly the Army cooking which two years ago left much to be desired has now improved so much that it compares favourably with that in civilian life.

Maingot (1941) has made the astounding assertion that the Army contains a host of officers and men suffering from chronic ulcer of the stomach and duodenum who prefer to treat themselves and do not report sick; but he vouchsafes no evidence in support. Two years in military hospitals and in the field has satisfied me that his is a gross overstatement. The facilities for self-treatment in the Army are so restricted for economic and environmental reasons as to be negligible. Canteen supplies are limited, proprietary alkaline preparations are expensive in terms of a soldier's pay, and opportunities for rest or for small and frequent meals do not exist save in very exceptional circumstances.

It has been stated that transient dyspepsia is not uncommon during the early weeks of military training before the recruits have adjusted themselves to their new environment (Tidy 1941). Such cases, however, do not figure in the records of this hospital, since only 7 of the 247 now under consideration had had less than 3 months service; the majority (213) had been serving in the Army for over 6 months. The age-groups and length of military service of these patients were as follows:

		Physically unfit	Returned to duty
Age	20–30 yr.	60	61
	Over 30 yr.	71	55
Military service	Under 3 months	4	3
	3–6 months	16	11
	Over 6 months	111	102

All observers agree that frank malingering is not a feature in the dyspeptic soldier and the number of cases in which there appears to be any material degree of neurosis is negligible. On the other hand some exaggeration of symptoms is common, and I am unable to appreciate the finer distinctions between an exaggeration and a neurosis. In civilian practice patients with gastric and duodenal ulcer obtain rapid relief of symptoms from rest in bed and diet, but in my experience such symptomatic relief is rarely encountered in military practice.

Major W. M. Forster, radiologist to this hospital, informs me that from Nov. 1, 1940, to Oct. 31, 1941 barium-meal examinations were carried out on 429 patients (inpatients and outpatients together) referred to his department. Of these, 152 (35.4%) had a demonstrable gastric or duodenal ulcer and 54 (12.6%) gastritis or duodenitis. The proportion of gastric to duodenal ulcers was 1 to 3.2. Thus, an organic lesion was found in approximately half the cases so examined and this accords with the experience of other observers (Graham and Keir 1941, Maingot 1941, Morris 1940, Hutchison 1941).

RECOMMENDATIONS

Whenever a diagnosis of ulcer has been established the soldier should be invalided from the Army and returned to civilian life in the shortest possible time. Only then can he have the domiciliary treatment with rest, diet, and tranquillity of mind which is impossible in a military environment. In very few instances have the symptoms originated during military service and most of these patients, before enlistment, had learned to adjust their diets and mode of life sufficiently to keep their indigestion under control. They were leading useful lives in the service of their country and to such service they are capable of returning. In the Army they remain a burden to themselves and others. In all other cases, too, a decision as to the man's disposal should be made as rapidly as possible. Nothing is more detrimental to the doubtful dyspeptic soldier than to allow him to languish in hospital when there is no real need. Patients who have been "investigated" in hospital not once or twice but even three or four times are quite often encountered; those who had a minor or functional dyspepsia at the onset are ruined, in a military medical sense, after two hospital periods in which nothing was definitely decided. Their initial uncertainty of their digestive functions has been converted into a frank conviction of its imperfections and their rehabilitation to a military environment is well-nigh impossible. I do not wish to imply that soldiers suffering from indigestion should not be completely examined by all possible means to ascertain the nature of their malady, but I do plead that so far as possible they should not be admitted to hospital for this purpose. I prefer to investigate as outpatients those who in my clinical opinion do not require inpatient treatment. Finally, the segregation of soldiers suffering from dyspepsia into one ward is definitely detrimental to their interests. Such advantages as accrue from the organisation, management and treatment of such cases are far outweighed by the adverse reactions on the individual. This segregation certainly makes symptoms spread and makes the return of the mild, simple and functional cases to duty much more difficult; they think they are being victimised.

REFERENCES

Graham, J. G., and Kerr, J. D. O. (1941) *Brit. med. J.* i, 473.
Hutchison, J. H. (1941) *Ibid*, ii, 78.
Morris, H. (1940) *Ibid*, ii, 235.
Maingot, R. (1941) *Ibid*, i, 533.
Payne, R. T., and Newman, C. (1940) *Ibid*, ii, 819.
Tidy, H. L. (1941) *Lancet*, i, 448.

COURSE ON INDUSTRIAL MEDICINE.—On March 21 and 22 a week-end course on industrial medicine will be held at the University of Birmingham. On Saturday afternoon Prof. Seymour Barling, M.S., will speak on the injured workman and Dr. J. M. Davidson on toxic hazards in industry. On Sunday the lecturers will include Dr. E. H. Capel, health factors in industrial absenteeism; Dr. T. L. Hardy, treatment of medical emergencies in factories; Mr. William Gissane, F.R.C.S., a scheme for the treatment of the injured workman; and Prof. Sargant Florence, Ph.D., industrial fatigue. Further information may be had from the secretary of the university, Edmund Street, Birmingham, 3.

Medical Societies

ROYAL SOCIETY OF MEDICINE

At a meeting of the section of Surgery on March 4, Mr **Rock Carling** the president, in the chair, introduced a discussion on

Growth and New Growth

by referring to the effect of radiation on new growths which he had studied for many years. He believed the final control of growth, including malignant growth would be physiological. He thought that the power of X rays was out of all proportion to the stimulus which required control. This was always an enzyme or chemical agent.

Mr **Harold Burrows**, F R C S, considered that the influence of œstrogens could be used to illustrate the action of both stimulators and regulators of tissue growth. Their chemical composition was known and they were available in pure form. They influenced controlled, uncontrolled and imperfectly controlled growth. Œstrin controlled cellular differentiation and function—for example it arrested the growth of epiphyseal cartilage causing bony union between the epiphysis and shaft. It had a specific action on organs of sexual reproduction irrespective of the sex of the subject, since homologous structures in the two sexes responded alike. There were thus responsive and irresponsive tissues, and gradients of responsiveness could be demonstrated in the skeleton of the mouse. Some of the effects were reversible and others, for example mammary cancer, were irreversible. Resistance to the action of œstrin could be brought about but not by the action of antihormones. Œstrin was inactivated by the liver and excreted in the urine. Its production in the body was controlled by the pituitary directly and indirectly by its own output from the ovary. There were both antagonism and coöperation between œstrin and other hormones. The uncontrolled growths which œstrin could stimulate were non-specific subcutaneous sarcomas in rats and mice, and mammary uterine and bone tumours, to which œstrin was specifically related in a physiological way. But œstrin alone could not cause cancer in these organs. Two other factors were needed, one being a mendelian dominant genic factor governing susceptibility, the other a non-genic transmissible factor which passed to the offspring in the mother's milk. This transmissible agent might be a virus. Among the imperfectly controlled growths were fibromyomata of the uterus, ovarian cysts, and chromophobe tumours of the pituitary.

Dr **W E Gye** was puzzled that two such dissimilar forms of growth as those in the title of the discussion should be compared. If one understood the title to mean multiplication of cells rather than increase in volume, then increase in number of cells was all that there was in common between cancer, in which we were really interested, and physiological or other forms of pathological growth. All forms of growth required a stimulus. It was desirable that bone-marrow, skin and intestinal epithelium should remain capable of multiplication throughout life in order to respond to wear and tear and to disease. Any cancer cure founded on a growth-inhibiting capacity would lead to death from aplastic anæmia on a bed of cotton-wool. Cell deficiencies must be made up for according to need but when the stimulus ceased multiplication became limited also. In true new growth, on the other hand the cell contained its own stimulus and grew, as Ribbert had discovered *aus sich heraus*. There was no control outside the cell itself, and its power to divide was autonomous. This had been proved by transplantation of tumour tissue, and at the laboratory of the Imperial Cancer Research Fund a mammary tumour was growing which had developed in a mouse born in the reign of Queen Victoria. It had since been transplanted through many generations of mice. A hypothesis had been suggested that this kind of autonomous growth was a mutation. There was no factual basis for this view. On the other hand, it was a fact that certain viruses could make cells multiply and that certain of them could cause cancer.—The **President** then intervened to complain that the saying that one should undergo a new cure while it still cured had been attributed by Dr Gye to Charcot whereas Abernethy was responsible for it. He also pointed out that fibroblasts in tissue culture were capable of indefinite multiplication and had been grown by Carrel for over 30 years, yet they were not malignant.

Mr **Peter Medawar**, M A, speaking as a biologist, said he would like to examine two hypotheses derived from biology to see if they could explain malignant growth. Hypotheses could never be refuted; they just slowly faded away. The doctrine that malignant cells were essentially those which had escaped from the growth-controlling influences of the body did not agree with the evidence which went to show that there was a balance between more growth and less growth, not between malignant and normal growth. The phenomenon of post inhibition rebound which represented the organism's ability to accelerate growth to compensate for a period of retardation, was very widespread yet it was not accompanied by cancer.

Dr. **F G. Spear** and Dr **A. Glücksmann** had found a correlation between the processes of proliferation and differentiation which occurred in normal development—in the retina for example—and contrasted this with the same processes in malignant growths. They had found the same laws were obeyed. When proliferation was active there was less differentiation and vice versa. At the growing edge of tumours the proportion of resting, proliferating and differentiating cells was more constant than elsewhere. Proliferating tissue was more sensitive to irradiation than when it was differentiating.

Mr **L R Broster** F R C S thought that the discussion had centred so far in the laboratory aspect of cancer—that was at the beginning of the process. The surgeon's view of the subject was the end of the process. To solve the problem a combined team was desirable. In his experience he had found that growth was controlled by hormones in postnatal life and in disease. Specialised growth was determined by the adrenal cortex and then only was associated with a specific stain and altered steroid metabolism. Fuchsinophil granules appeared in the cells of the adrenal cortex. He showed many photographs illustrating unbalanced growth which had been traced to abnormal cortical secretion and in other cases to disorder of the pituitary gland. Observations on the adrenal cortex had confirmed the work of experimental embryologists in assigning growth direction to a morphogenetic hormone which was also steroid in nature.

Dr **Alexander Haddow** said that normal and malignant growth should not be compared. The normal was subject to restraint due to population density and not to humoral conditions, malignant growth to unmasking of a property which was controlled in normal cells. It was not a new property. The difference from normal was not the rate of growth but its maintenance over a long period both in vivo and in vitro. He suggested that malignancy followed interference with rate of growth. Certain carcinogenic hydrocarbons interfered to retard over a longer period than did many miscellaneous compounds. There was a compensatory hypertrophy which could be made persistent. A parallelism which was close but not quite perfect existed between inhibitory and carcinogenic properties. He discussed possible ways through which this inhibition might be brought about.

In reply to Mr Rock Carling, Dr **Gye** said that in contrasting a fibroblast in tissue culture with autonomous growth the real point at issue could be shown in this way. If the fibroblasts which had been grown in vitro were transplanted back into the same chick from which they were derived they would die; if malignant fibroblasts were transferred to a tissue culture and then back into the chick they would survive, multiply and reproduce the same kind of growth from which they had originally been taken.

Mr **R J. Ludford**, D Sc, pointed out also that carcinoma cells could be grown in vitro in a medium of normal serum, whereas both normal embryonic and adult cells required the presence of growth-promoting substances which were not present in normal serum to make them proliferate.

Reviews of Books

Diagnostic Roentgenology

Vol 2 Editor ROSS GOLDEN, M D, professor of radiology, Columbia University New York Thomas Nelson and Sons Pp 600

THE loose-leaf system makes revision difficult, but Dr Dyke has boldly discarded his inadequate chapter on the skull and intracranial contents and has drawn on his vast experience to describe in 250 pages (with 334 illustrations) every normal and abnormal radiological finding with their basic pathology His section on traumatic disorders, with a table for the rate of healing of linear fractures of the skull, fills an important gap in radiological literature Dr Rabin adds to his chest section erudite papers on pulmonary markings, nodular and miliary diseases of the lungs, differential diagnosis of cavities, and X-ray artefacts His statement that a positive Wassermann reaction in a patient with a nodular shadow should not deter one from making an immediate exploratory operation may be intentionally provocative A new 150-page monograph on X-ray diagnosis in infants and children by Dr Caffey of the Babies Hospital, New York, is welcome as the first comprehensive work on the subject in English, few radiologists have much experience of diseases in infants He describes system by system the radiological abnormalities in the newborn with separate chapters on blood diseases, storage diseases, avitaminoses, pulmonary tuberculosis and syphilis Much of this material is new and much could only have been obtained by worldwide study of published pædiatric work Dr Lingley and Dr Elliot's brief chapter contains all that is known of soft-tissue radiography and Dr Moore writes on body-section rontgenography, giving a useful chart of distances and exposures In the final chapter on angiography Dr Camp and Dr Allen describe the work done so far, with particular reference to the collateral circulation in peripheral vascular diseases They recognise that this method will find no permanent place in clinical radiology until a non-toxic, non-irritant opaque medium is discovered The general editor is to be congratulated on index and bibliographies

Disorders of the Blood Pressure

Editors SIR HUMPHRY ROLLESTON, Bt, M D Camb, F R C P, ALAN MONCRIEFF, M D Lond, F R C P London The *Practitioner* with Eyre and Spottiswoode Pp 83 6*s*

OF the recent advances in our knowledge of high blood-pressure the most important to the practitioner is the recognition of a malignant form of essential hypertension, a special article in this booklet by various authors deals with the clinical and histological findings in this condition High blood-pressure in general is reviewed in the opening chapter, which is followed by a practical account of sphygmomanometry with special reference to prognosis for life-insurance The article on treatment is in the traditional style, the patient with symptomless hypertension is deprived of gravy, soup, stews and alcohol and no mention is made of the use of organic mercurials in the treatment of hypertensive heart failure The "attainment of the optimum pressure" which the writer advocates is in more ways than one a counsel of perfection. The article on hypotension includes interesting case-records The booklet suffers from lack of a uniform terminology The terms essential hypertension, benign hypertension, malignant hypertension hyperpiesia, nephrosclerosis, non-nephritic hypertension and diffuse hyperplastic sclerosis are used in succession by the different authors—who thus leave the general reader with the false impression that the subject is as confused as ever

Nutrition and Victory

Food Problems in War and Peace ERWIN PULAY, M D Vienna London Research Books and Wm Heinemann (Medical Books) Pp 118 6*s*

THE reader comes to this book with a prejudice in its favour It is written by an obvious refugee, it has a charming dedication to Winston Spencer Churchill, it is well produced and a fleeting perusal shows it to be brightly written and well translated The cover claims it to be one of the first contributions indicating the rôle of science in a new world order Our material civilisation is built upon scientific discovery, our future progress depends upon the right use of the scientific method, and our only guarantee of a safe and happy future depends on the understanding of the merits and the defects of the scientific method by politicians and people, so that any book which aims at expounding the rôle of science in the new world order is to be welcomed In any country imbued with the scientific habit of mind the Aryan myth and the vagaries of eugenic and dietetic mountebanks would be laughed out of court But it is to be doubted if a short book on dietetics can do much either for the general reader or for the expert Dietetics is so new a subject, develops so rapidly, changes its viewpoint so often, is so ready to challenge at any moment axioms which seemed to older workers fundamental and is so beset by cranks and charlatans that it is doubtful if it can be given to the world in general except in one of two ways as a brief, dogmatic, approximate statement, rather like a creed, or as a long, involved, highly critical and scientific treatise *There can be no half measures What we do* know about dietetics can be written on a thumbnail; what may turn out to be the truth in dietetics demands a tome This book, unhappily, is neither the one nor the other

Year Book of General Medicine, 1941

Editors GEORGE F DICK, M D, J BURNS AMBERSON, Jr, M D, GEORGE R MINOT, M D, S D, F R C P and WILLIAM B CASTLE, M D, S M, WILLIAM D STROUD, M D, GEORGE B EUSTERMAN, M D Chicago The Year Book Publishers, London H K Lewis Pp 848 16*s* 6*d*

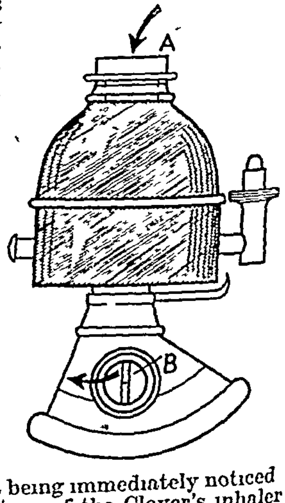
THIS American book follows its useful plan, under its usual editorship, of presenting abstracts of moderate length from the year's outstanding contributions in general medicine Their sources are predominantly American and many are illustrated The fields covered are infectious diseases, metabolic diseases, and diseases of the heart and vessels, the lungs, the digestive system, the blood and the kidney The editors do not confine themselves to new work in the strict sense, but often summarise papers which review or revise our knowledge of important conditions Many readers would welcome a little more of the editorial comment on which they venture as yet but sparingly The general physician, consultant or otherwise, will find the yearbook good for reference and for dipping into

---

New Inventions

IMPROVED CLOVER'S (OR HEWITT'S) INHALER

BY means of a simple valvular device one's old Clover's inhaler can again become a valued possession, new inhalers can also be made with the device already fitted The bag of the old inhaler is discarded and an inspiratory valve inserted into the circular opening (A) to which the bag was attached and an expiratory valve (B) is let into the side of the face-piece



The anæsthetic chamber is filled with the anæsthetic to be used, and the strength of the vapour administered is regulated by the standard control handle Rebreathing does not occur with this apparatus, on inspiration the dome valve opens and the face-piece one closes while on expiration the former closes and the latter opens With both movements the clicking sound of the valves can be heard and so there is no danger of the patient stopping breathing without it being immediately noticed stopping breathing without it being immediately noticed

By means of this modification of the Clover's inhaler the volatile general anæsthetics (ethyl chloride, ether, chloroform, &c) can be given more safely, easily and efficiently than by the open-mask method These valves and inhalers can be obtained from Elliott's of Sydney, but any hospital workshop could carry out the changes

G S THOMPSON, F R C S

Sydney, Australia

THE LANCET

LONDON SATURDAY, MARCH 14, 1942

DOMESTIC INSECTS

If domestic insects are defined as those arthropods about which the medical officer of health in this country may be called on to advise they embrace a great diversity of forms, ranging from intimate parasites living on the person such as the itch mite or the louse, to occasional entrants into the house, such as ants and earwigs Many of these pests have formed problems in public health for long enough others have become more insistent in recent years and yet others have become more troublesome or have appeared in new circumstances since the war began How far the conditions of war-time are a cause of the observed increases or how far these conditions merely provide an opportunity for their observation and record is often difficult to decide Head-lice have long been a preoccupation of school medical officers, but it was the evacuation of children from the large towns that brought them forcibly to the public notice and provided the stimulus for MELLANBY'S[1] survey which demonstrated that about half the children in our large cities were infested Entomologists have suspected that the custom among women of having their hair elaborately dressed and then leaving it undisturbed must be associated with an increase in lousiness but it was the recruitment of large numbers of young women in war factories and presumably also in the Services which demonstrated how very prevalent such lousiness is The incidence of scabies is rising rapidly but the increase had begun several years before the war,[2] and whether the war has provided a stimulus to this increase besides focusing attention on it is at present a matter of opinion The rate at which the bed-bug was colonising the new housing estates attracted attention long before the war a new problem is their prevalence in air-raid shelters

We have learnt a lot about these insects in the last few years In this advance a biological approach has been of value—the organisms have been thought of not merely as pests but as creatures whose population growth, ecology and physiology must be understood if the conditions of their survival are to be worked out This new knowledge will have its influence in shaping methods of control But it was not the public-health service which reduced the ubiquitous lice, bugs and fleas of a century and a half ago to their present restricted limits It was the persistence of certain sections of the community in cleanly habits And so today the health authorities can do little without the informed coöperation of the public The public is still appallingly ignorant Belief in the spontaneous generation of insects is wellnigh universal, and not only among uneducated people There is still much room for the dissemination of simple knowledge about domestic insect pests and for the inculcation of a reasonable attitude towards them

The medical officer of health may be expected to be well-informed about the more familiar pests though even with them he does not always have access to the most recent information He cannot be expected to be an expert on the less familiar insects—to advise for example on infestations with pollenia to discriminate between destructive beetles and harmless visitants from the garden or to be able to say emphatically that workmen are unjustified in refusing to demolish a house because collembola are swarming in it Nor will he know where to apply for the information he wants and there is still no machinery for dealing with these questions. Perhaps the most useful advance would be for the Ministry of Health to employ its own advisory entomologist An entomologist with free access to the work carried out in the field by medical officers of health and located in one of the chief centres of entomological research would be an invaluable link in the network for disseminating knowledge Where he was unable to answer a question himself or by his own investigations he would know where to turn for help He would know where are the chief centres of scabies or louse research, that the Medical Research Council has a committee of experts on the bed-bug, that insects damaging timber are the province of the Forest Products Research Laboratory of the Department of Scientific and Industrial Research that the Pest Control Laboratory of the same department is the best source in regard to insects in stored products that the Royal Horticultural Society have made a special study of ants and earwigs and so forth The personal link is still the best in ensuring the rapid dissemination of knowledge A link between the field of practice and the research work in university departments in this sphere as in others could not fail to exert a healthy stimulus on both

RED-CELL SHAPE AND SIZE

THE work of PRICE-JONES stimulated an enormous interest in the size and shape of the red cells in anæmia It was confirmed everywhere that in pernicious anæmia so many of the red cells are larger than normal that the average diameter of a large number of red cells is considerably above the average diameter of an equal number of normal cells, PRICE-JONES also showed that in pernicious anæmia the frequency curve of the occurrence of different sizes of red cells was altered in a characteristic manner. These findings were soon applied to the diagnosis of anæmia of uncertain origin but the technique of PRICE-JONES involved the outlining and measurement in two diameters of at least 500 erythrocytes, and this with the necessary computations, took much time and effort Devices like that of HYNES and MARTIN[1] go some way towards reducing this effort, but the popular methods are those that give a direct answer, even though they give no information about the frequency distribution First come the diffraction methods such as those of PIJPER and EVE, which give the mean red-cell diameter from an evenly spread film The second method is based on the observation that mean cell volume and mean cell diameter as a rule run parallel, mean cell volume is easily determined by means of the hæmatocrit and several accurate methods for determining it WINTROBE'S being most popular, are available It was

---

[1] Mellanby, K *Med Offr* 1911, 65, 39

[2] [illegible] 66, 141

[1] Hynes M and Martin L C *J Path Bact* 1936 40, 365

Reviews of Books

Diagnostic Roentgenology

Vol 2 Editor Ross Golden, M D, professor of radiology, Columbia University New York Thomas Nelson and Sons Pp 600

The loose-leaf system makes revision difficult, but Dr Dyke has boldly discarded his inadequate chapter on the skull and intracranial contents and has drawn on his vast experience to describe in 250 pages (with 334 illustrations) every normal and abnormal radiological finding with their basic pathology His section on traumatic disorders with a table for the rate of healing of linear fractures of the skull, fills an important gap in radiological literature Dr Rabin adds to his chest section erudite papers on pulmonary markings nodular and miliary diseases of the lungs, differential diagnosis of cavities, and X-ray artefacts His statement that a positive Wassermann reaction in a patient with a nodular shadow should not deter one from making an immediate exploratory operation may be intentionally provocative A new 150-page monograph on X-ray diagnosis in infants and children by Dr Caffey of the Babies Hospital, New York, is welcome as the first comprehensive work on the subject in English, few radiologists have much experience of diseases in infants He describes system by system the radiological abnormalities in the newborn with separate chapters on blood diseases, storage diseases, avitaminoses, pulmonary tuberculosis and syphilis Much of this material is new and much could only have been obtained by worldwide study of published pædiatric work Dr Lingley and Dr Elliot's brief chapter contains all that is known of soft-tissue radiography and Dr Moore writes on body-section rontgenography, giving a useful chart of distances and exposures In the final chapter on angiography Dr Camp and Dr Allen describe the work done so far, with particular reference to the collateral circulation in peripheral vascular diseases They recognise that this method will find no permanent place in clinical radiology until a non-toxic, non-irritant opaque medium is discovered The general editor is to be congratulated on index and bibliographies

Disorders of the Blood Pressure

Editors Sir Humphry Rolleston, Bt, M D Camb, F R C P, Alan Moncrieff, M D Lond, F R C P London The *Practitioner* with Eyre and Spottiswoode Pp 83 6*s*

Of the recent advances in our knowledge of high blood-pressure the most important to the practitioner is the recognition of a malignant form of essential hypertension, a special article in this booklet by various authors deals with the clinical and histological findings in this condition High blood-pressure in general is reviewed in the opening chapter, which is followed by a practical account of sphygmomanometry with special reference to prognosis for life-insurance The article on treatment is in the traditional style, the patient with symptomless hypertension is deprived of gravy, soup, stews and alcohol and no mention is made of the use of organic mercurials in the treatment of hypertensive heart failure The "attainment of the optimum pressure" which the writer advocates is in more ways than one a counsel of perfection The article on hypotension includes interesting case-records The booklet suffers from lack of a uniform terminology The terms essential hypertension, benign hypertension, malignant hypertension hyperpiesia nephrosclerosis, non-nephritic hypertension and diffuse hyperplastic sclerosis are used in succession by the different authors—who thus leave the general reader with the false impression that the subject is as confused as ever

Nutrition and Victory

Food Problems in War and Peace Erwin Pulay, M D Vienna London Research Books and Wm Heinemann (Medical Books) Pp 118 6*s*

The reader comes to this book with a prejudice in its favour It is written by an obvious refugee, it has a charming dedication to Winston Spencer Churchill, it is well produced and a fleeting perusal shows it to be brightly written and well translated The cover claims it to be one of the first contributions indicating the rôle of science in a new world order Our material civilisation is built upon scientific discovery, our future progress depends upon the right use of the scientific method, and our only guarantee of a safe and happy future depends on the understanding of the merits and the defects of the scientific method by politicians and people, so that any book which aims *at expounding the rôle of* science in the new world order is to be welcomed In any country imbued with the scientific habit of mind the Aryan myth and the vagaries of eugenic and dietetic mountebanks would be laughed out of court But it is to be doubted if a short book on dietetics can do much either for the general reader or for the expert Dietetics is so new a subject, develops so rapidly, changes its viewpoint so often, is so ready to challenge at any moment axioms which seemed to older workers fundamental and is so beset by cranks and charlatans that it is doubtful if it can be given to the world in general except in one of two ways as a brief, dogmatic, approximate statement, rather like a creed, or as a long, involved, highly critical and scientific treatise There can be no half measures What we *do* know about dietetics can be written on a thumbnail, what may turn out to be the truth in dietetics demands a tome This book, unhappily, is neither the one nor the other

Year Book of General Medicine, 1941

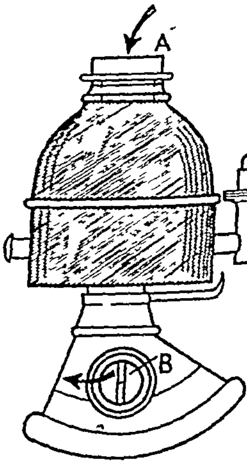
Editors George F Dick, M D, J Burns Amberson Jr, M D, George R Minot, M D, S D, F R C P and William B Castle, M D, S M, William D Stroud, M D, George B Eusterman, M D Chicago The Year Book Publishers, London H K Lewis Pp 848 16*s* 6*d*

This American book follows its useful plan, under its usual editorship, of presenting abstracts of moderate length from the year's outstanding contributions in general medicine Their sources are predominantly American and many are illustrated The fields covered are infectious diseases, metabolic diseases, and diseases of the heart and vessels, the lungs, the digestive system, the blood and the kidney The editors do not confine themselves to new work in the strict sense, but often summarise papers which review or revise our knowledge of important conditions Many readers would welcome a little more of the editorial comment on which they venture as yet but sparingly The general physician, consultant or otherwise, will find the yearbook good for reference and for dipping into

New Inventions

IMPROVED CLOVER'S (OR HEWITT'S) INHALER

By means of a simple valvular device one's old Clover's inhaler can again become a valued possession, new inhalers can also be made with the device already fitted The bag of the old inhaler is discarded and an inspiratory valve inserted into the circular opening (A) to which the bag was attached and an expiratory valve (B) is let into the side of the face-piece



The anæsthetic chamber is filled with the anæsthetic to be used, and the strength of the vapour administered is regulated by the standard control handle Rebreathing does not occur with this apparatus, on inspiration the dome valve opens and the face-piece one closes while on expiration the former closes and the latter opens With both movements the clicking sound of the valves can be heard and so there is no danger of the *patient* stopping breathing without it being immediately noticed

By means of this modification of the Clover's inhaler the volatile general anæsthetics (ethyl chloride, ether, chloroform, &c) can be given more safely, easily and efficiently than by the open-mask method These valves and inhalers can be obtained from Elliott's of Sydney, but any hospital workshop could carry out the changes

G S Thompson, F R C S

Sydney, Australia

of the neutron by the deutron resulting in the isotope of phosphorus with atomic weight 32 (P^{32}) This substance emits beta rays only and becomes sulphur There is no gamma-ray emission but the beta rays are fairly energetic, the upper limit being at about 1 7 million electron volts The half-life of radio-phosphorus is 14 5 days, a very convenient period for biochemical studies It has been used in studying the phosphorus exchange in the teeth and in the blood of animals and patients, and in elucidating lipoid mechanisms[2] In studies of the deposition of radio-phosphorus in tissues of growing chicks[3] the distribution of the material throughout the tissues was studied as well as the effects on blood The phospho-lipoid exchange of four tumours has also been investigated and it has been found[4] that cell type is not the factor determining the level of the phospholipoid activity of the tumour The comparative metabolism of phosphorus in normal and lymphomatous animals has also been inquired into[5] The most useful isotopes of iodine appear to be those of mass 128 (half-life 25 minutes) and another of mass 131 (half-life 8 days) The rate of uptake of these by the thyroid has been observed after intravenous injection, the peak of the concentration of the iodine being attained in 10–15 minutes There is a distinct possibility of using radioactive iodine as a therapeutic agent, for a bombardment of considerable intensity could be delivered to the thyroid itself These possibilities, and recent work on iodine, have lately been reviewed by SALTER[6] It seems that the new element 85 has, in common with iodine, an affinity with the thyroid Iron, which can be made radioactive in sufficient quantities in the cyclotron, is obtained by bombarding the iron Fe^{58} with deutrons, thus forming an unstable isotope (59) which decays to Co^{59} with the emission of beta rays The radio-iron has a long life of about 47 days and has been used by WHIPPLE and HAHN in studies of blood regeneration They have also published an account of radioactive iron and its metabolism in anæmia as well as its absorption, transport and utilisation[7] The iron lends itself admirably to the study of its changes in body metabolism The need of the body for iron in some measure determines its absorption—for example, in the normal dog it is absorbed in a negligible amount whereas an anæmic dog promptly assimilates it The blood seems to be the means of transport from the gastro-intestinal tract to its point of mobilisation where it is ready for final fabrication into hæmoglobin Radioactive sodium, produced by bombarding $sodium^{23}$ with high-speed deutrons, is again formed by neutron capture—that is the neutron changes $sodium^{23}$ to $sodium^{24}$ This unstable isotope gives off high-speed electrons and becomes magnesium, which emits gamma rays of great energy, greater indeed than those of radium $Sodium^{24}$ has a half-life of 14 8 hours and has been produced in very large amounts (1 curie) by the cyclotron It may therefore be used extensively as a source of gamma rays or injected during studies of sodium metabolism, many of which have been carried out[8]

It will be seen that in these four radioactive elements alone chemical physiology has powerful new weapons but a word of warning is necessary against wishful thinking It has always seemed possible that the radioactive radiations from these substances might influence their distributions, and it is questionable to what extent the results obtained with radioactive elements are a true guide to the behaviour of non-radioactive isotopes Lately workers at the Memorial Hospital[9] have shown that subtherapeutic amounts of radioactive phosphorus altered the organic acid-soluble phosphorus fraction of the blood-cells of patients with leukæmia, whereas the administration of non-radioactive phosphorus was never followed by any significant alteration in this fraction Moreover, the same changes were observed after the administration of very small doses of whole body X irradiation, as well as after irradiation of the blood through a precordial port It seems that the amount of radiation delivered by the tracer doses of radioactive isotopes used in the study of metabolism cannot be regarded as negligible, and it is possible that some of these studies have measured the metabolic changes consequent on irradiation Whether this proves to be so or not, the new giant cyclotron, which let us hope will escape aerial bombardment, will enable a more vigorous attack to be made on the problem, and we may look forward to the time when radioactive elements will be available in quantity in both the United States and this country

NOTIFICATION OF TOXIC ANÆMIA

IT is known that anæmias of various types and different grades of severity may arise in people exposed to X rays, radio active substances, and certain chemicals such as TNT and benzol But our knowledge of the action of many chemical substances on the blood-forming organs is incomplete, and in order that fuller information about industrial causes of anæmia may become available and that the conditions of work may be controlled "toxic anæmia" has been made notifiable under section 66 (4) of the Factories Act 1937 Every medical practitioner attending on, or called in to visit, a patient whom he believes to be suffering from anæmia contracted through exposure to the agents mentioned is required to notify the case to H M chief inspector of factories, Ministry of Labour, 28 Broadway, London, S W 1 The occupier of the factory in which the case occurs is also instructed to send written notices to the examining surgeon and the district inspector Other conditions already notifiable under s 66 (4) are lead, phosphorus, arsenical mercurial, manganese carbon bisulphide, aniline or chronic benzene poisoning, as well as anthrax, toxic jaundice, compressed air illness, and epitheliomatous or chrome ulceration It is of interest to note that TNT poisoning is now notifiable both as toxic jaundice and toxic anæmia depending on the predominant clinical features of the illness The reasons for the extension of this section of the Factories Act are set out in an explanatory memorandum (form 2011, Feb 1942) and the order (SR&O 1942, no 196 HMSO 1d) came into operation on the first of this month thus not a long step to the assumption that increased mean cell diameter or increased mean cell volume indicated that an anæmia was pernicious in type and should be treated on similar lines This common assumption has broken down in two ways The work on sternal marrow biopsy has shown that increased average size of red cells is not necessarily correlated with the megaloblastic pernicious type of marrow, but may also occur when the marrow is normoblastic and there is no apparent relation to pernicious anæmia It was found, too, that in congenital hæmolytic icterus the mean cell diameter might be diminished or normal while the mean cell volume was increased, and this was shown to be due to the presence of spheroidal red cells—spherocytes These newer results have had their effects sternal puncture has become the criterion for the diagnosis of pernicious and allied anæmias, and any worker nowadays who represents an anæmia as of the pernicious type on the basis of mean cell diameter or volume measurements alone lays himself open to serious criticism, the study of the shape of the red cell has been stimulated anew, but in fresh directions

---

[2] Hevesy G Holst, J J and Krogh A Quoted in Artificial Radioactivity and Neutron Rays in Biology and Medicine by J H Lawrence Handbook of Physical Therapy American Medical Association 1939

[3] Cook S F Scott, K. G and Abelson, P *Proc Nat Acad Sci* 1937, 23, 528

[4] Jones H B Chaikoff I L and Lawrence J H *J biol Chem* 1939 128 631

[5] Lawrence J H and Scott, K. G *Proc Soc exp Biol N Y* 1939 1939 40 694

[6] Salter, W T The Endocrine Function of Iodine, London 1941

[7] Hahn, P F Bale W F Lawrence E O and Whipple G H 9

[8] Lawrence J H *Loc cit* Hamilton J G *Proc nat Acad Sci Wash* 1937, 23, 521 Hamilton and Stone R S *Radiology* 1937, 28 178

[9] Abeles J C, Kenney J M Craver L Marinelli L D and Rhoads C P *Cancer Research*, vol 1, p 771, 1941

The spherocyte is a red cell which is smaller and thicker than normal Its presence in the blood of patients with congenital hæmolytic icterus has been known for some years; it can be picked out in wet preparations or in the usual dry smears in which it appears as a densely stained *microcyte* Since the action of hypotonic saline is to cause the red cell to imbibe water, swell and burst, the spherocytes—which are already half-way to bursting point—hæmolyse in less hypotonic saline than normal cells, so that when there are many present the blood-cells exhibit increased "fragility" to hypotonic saline By one school the spherocyte has been regarded as a congenitally abnormal red cell produced by the bone-marrow, and the hæmolytic phenomena accompanying its presence are traced to its exceptional fragility The opposition school regard the spherocyte as produced secondarily by the action of hæmolytic agents on previously normal cells, and this view, which is at present dominant, has received considerable experimental support from the work of DAMESHEK and SCHWARTZ,[2] who reviewed the whole subject 2 years ago Another unusually shaped red cell is the "target cell" HADEN and EVANS[3] described "dimpled" cells in the blood of patients with sickle-cell anæmia, BARRETT[4] found these cells in various conditions and showed that in wet preparations they were bowl-shaped, but when dried they developed a hump within the bowl which appeared in the dry films like a full-stop or a dash in the pale centre of the erythrocyte, he named them target cells and showed, as have subsequent workers, that they are unusually resistant to hypotonic saline Like the spherocyte, there are two views about the significance of the target cell DAMESHEK,[5] who found large numbers of target cells in the blood of a patient with Cooley's anæmia, thought it was a congenitally defective cell On the other hand, BOHROD[6] has put forward evidence that the target cell appears whenever there is rapid erythrocyte formation, as after a severe hæmorrhage, in acute blood loss their appearance is only transitory, but in chronic loss the cells may be constantly present and in large numbers, and often there is a parallel reticulocytosis, target cells appear whatever the cause of the blood loss

If we contrast sternal puncture and the detection of unusual red cells like spherocytes and target cells with the more established procedures of determining mean cell diameter, volume, thickness and other values, the notable point is that the former group are *qualitative only, but need considerable discrimination* and the attention of the physician himself, whereas the latter, though quantitative, can, once the blood is taken, be left to computation by technicians It is true that spherocytosis can be detected by estimating the mean cell thickness, but this is not easy because the calculation involves the square of the mean cell diameter and therefore none of the short-cut methods for determining the mean cell diameter can be used This emphasises the present trend in hæmatology that the physician must more and more be prepared to give personal attention to the laboratory tests needed for diagnosis, and to rely less on the presentation of a number of calculated results and indices whose value in diagnosis is being steadily whittled down

APPLICATIONS OF THE CYCLOTRON

THE development of medicine increasingly depends on the development of the other sciences, and major advances in technique and theoretical ideas in the so-called basic sciences of physics, chemistry and biology are inevitably reflected in changes of equipment and outlook in clinical practice When artificial radioactivity was discovered it required little imagination to see that here was a line of advance likely to influence certain branches of medicine—not only those directly concerned with the application of radiation—and when the cyclotron was developed by LAWRENCE and his co-workers these possibilities blossomed into accomplished fact But the amounts of artificial radioactive substances available were still relatively small and it seemed desirable to push the power of the cyclotron to the limit, to obtain enough material to be easily handled and of biological significance The size of successive cyclotrons therefore grew until an instrument is now being built at Berkeley, California, embodying a great magnet 56 feet long, and 30 feet high, having 184 inch pole pieces and containing 3700 short tons of steel and 300 tons of copper This giant, which has been briefly described by OLIPHANT[1] is designed to give 100 million electron volt deutons, and it will undoubtedly open up new fields in atomic physics and perhaps in medicine

The applications of the cyclotron in medicine which have so far been made may be classified roughly into two groups—the use of the new artificial radioactive substances as tracer elements, and the direct utilisation of the new substances as therapeutic sources of radiation In both fields the pioneer work is being largely done in the United States The use of tracers may be exemplified by four elements, phosphorus, iron, iodine and sodium Radioactive phosphorus has been made by bombarding red phosphorus with deutrons of 8 million volts and is formed by the capture many of those who did not answer his letter or refused to attend for interview were of higher mental and social level than those who did. Thus his pessimistic views on illegitimate motherhood may not have general application. But the psychological constellations and conflicts which he analyses so fully and ably are probably the same everywhere.

---

[2] Dameshek, W and Schwartz, S O *Medicine Baltimore,* 1940, 19, 231

[3] Haden, R L and Evans F D *Arch intern Med* 1937, 60, 133

[4] Barrett, A M *J Path Bact* 1938, 46 603

[5] Dameshek, *Amer J med Sci* 1940, 200, 445

[6] Bohrod, M G *Ibid,* 1941, 202, 869

[1] Oliphant, M L *Nature, Lond* 1941, 148, 717

COTTON AND CATGUT

THERE is a revival in the use of non-absorbable suture materials in surgery for which both their intrinsic merits and motives of economy are responsible. Some surgeons, of course, have always preferred to follow Halsted and use silk rather than catgut wherever possible, and now there are reports that cotton is even more satisfactory in some ways than silk. Meade and Long[1] have observed some 1800 cases in which cotton only was employed and noted a reduction of infection of clean wounds and of the period of sepsis in established infection. They found cotton pliable and strong and with a high coefficient of friction allowing secure and stable knots. It showed no tendency to excite the tissue reaction familiar to all who have had occasion to reopen a wound a few days after its suture with catgut, nor did it give rise to allergic reactions, an occasional trouble with catgut and even with silk. While the tensile strength of cotton is less than that of silk or catgut of equivalent diameter it is less altered by sterilisation and actually increases on boiling while that of silk decreases, a fact pointed out by Localio and Hinton,[2] who advise sterilisation by boiling for 10–20 minutes. Since the individual fibres contract on heating and may rupture if wound on a rigid bobbin, rewinding on soft rubber tubing or in skeins before boiling is advised. In the actual operation the user of cotton should adhere to Halsted's original principles—interrupted sutures only, many fine sutures rather than a few coarse ones, no bridging of dead spaces, and the avoidance of a mixture of absorbable and non-absorbable materials. Meade and Long would use cotton in all cases except where a continuous suture is essential, as in some intestinal anastomoses. They found that while 14% of clean wounds sewn with catgut became infected, the figures for silk and cotton were only 2.7% and 4%, in primarily contaminated cases all of the catgut series and 70% of the silk became infected but nearly half of those sewn with cotton healed by first intention. They conclude that cotton is better adapted for use in a contaminated or infected field than any other material since it gives rise to minimal œdema and cellular reaction. The economy of using cotton is obvious and this factor alone seems to justify some trials in this country.

PROGRESS WITH WAR-TIME NURSERIES

A DEPUTATION from the London Women's Parliament, composed of factory workers, shop stewards, representatives of factory management, housewives, councillors, doctors and teachers was received by the Ministry of Health on March 5 to discuss war-time nurseries. Cases of delay in setting up nurseries and of the difficulties experienced by mothers in finding somewhere to put their children while they themselves were in the factories, were considered, and the deputation offered the coöperation of the Women's Parliament in pushing forward with the establishment of war-time nurseries. The representatives of the management of three factories and the shop stewards were able to show how bad time-keeping, absenteeism, failure to respond to the demand for overtime and night shift work, and the continual loss of trained women from industry were all due to lack of care for the children. In reply, representatives of the Ministry said that the Ministry was anxious that nurseries should be available in each area to meet the need, and undertook to inquire into every case of delay mentioned by the deputation. They pointed out that over 300 nurseries are now in operation in the country as a whole (40 being in the London area) and 742 are in preparation. This figure is not, in fact, impressive. When the conference arranged by the Nursery School Association and the National Society of Day Nurseries met last November[1] there were 163 day nurseries in the whole of the country. Thus the number in action has been barely doubled in four months, but Miss Florence Horsbrugh estimated at the same conference that the need was for 10,000 day nurseries. Though this figure is probably beyond our powers of achievement for some time to come, we might at least try to progress on a scale which bears some relation to it, at the present rate it will take 22 years. The Ministry, indeed, assured the deputation that it was hoped that the pace would now be considerably increased, so that the point will be reached where every mother with young children wishing to take up war work would have the choice between a nursery and private arrangements. At the House of Commons debate on woman-power on March 5, Miss Horsbrugh remarked that for those mothers who lacked helpful neighbours the registered guardians scheme of the Ministry of Labour should be able to provide help.

AIR-RAID SHELTERS: NATURAL AND ACQUIRED

IN most parts of the country shelters are no more than waiting-rooms, used for brief periods at long intervals as protection against an infernal but temporary hailstorm. As such they have no special hygienic requirements other than ventilation and sanitary conveniences. But in towns liable to severe bombardment the hygiene of shelters must be appropriate to overcrowded underground houses in which conditions favour the spread of infection and infestation. Mr G. Morley Davies,[2] sanitary inspector for Bristol, has discussed the problems which arise in 'artificial' shelters, and Dr Edward Hughes,[3] medical officer of health for Dover, has done the same for natural shelters. In the cave shelters of Dover the chief disadvantages are dampness and lack of ventilation, and in all shelters the dangers of spread of infection and vermin must be specially guarded against. Following the suggestion in the Horder report spraying with hypochlorite solution is now a routine measure. In Bristol, shelters habitually occupied at night are sprayed daily, those used intermittently at night are sprayed every three days and surface shelters used only during alerts are sprayed once every ten days. In Dover shelters are sprayed daily. In addition a method of disinfestation is used regularly in the Bristol shelters, a 6% solution of an organic thiocyanate (known in America as 'Lethane 384 special') is used as a fumigant, being disseminated through an atomising spray-gun by a petrol driven compressor. This was used and found to be effective where vermin were presumed to be present, when their presence is certain a concentration of 10% can be used, and is believed to be strong enough to destroy live insects and all accessible ova. Dormitory shelters in Bristol are fumigated regularly once a week with the 6% solution, and it has been found that only food need be protected against it—everything else can safely be sprayed. There is some evidence that fabrics and fittings regularly treated in this way are no longer regarded by vermin as desirable residences, and thus the method is a safeguard against re-infestation. In Dover similar measures do not seem to have been necessary, but bedding is often inspected, and it has rarely been necessary to order disinfestation or destruction. The dampness of cave shelters has been partly overcome by putting in concrete or tarmac floors and sprinkling them with clean sawdust, and by improving ventilation. In Bristol the installation of mechanical ventilators in four shelters made a great difference in relative humidity as

---

[1] Meade, W. H., and Long, C. H. *J. Amer. med. Ass.* 1941, 117, 2140.

[2] Localio, S. A., and Hinton, J. W. *Surg. Gynec. Obstet.* 1941, 72, 613.

[1] See *Lancet*, 1941, ii, 583. [2] *J. R. Sanit. Inst.* 1942, 62, 34. [3] *Med. Offr*, 1942, 67, 13.

Annotations

THE NEW PROCLAMATION

UNDER the Proclamation of March 5 which raises the age of recruitment to the Fighting Services for men from 41 to 46 years, and makes women from 20 to 31 years similarly liable, it is proposed to call only medical men and dentists in the new age groups for military service in the immediate future This exceptional treatment is a measure of the heavy demand of the Services on these two professions The average age of their members is, of course, much higher than that of the general body of males At the census of 1931 the percentage of all occupied males in England and Wales over 45 years of age was 33 5, of medical practitioners 47 8 and of dentists 41 2 Moreover, the ages of practitioners in different parts of the country are so uneven that the recruitment only of the younger men would leave some areas seriously depleted, while others had a surplus For these reasons the Central Medical War Committee, after consultation with local committees, expressed the view some time ago that the policy now proposed by the Ministry of Labour should be adopted No doubt the inclinations of men who now fall within the new age of compulsory service, but express a preference for civilian work in districts where they might replace their juniors, will receive sympathetic consideration So far no indication has been given as to the procedure to be followed for the recruitment of young medical women, but no doubt it will take a form similar to that which has worked efficiently and fairly equitably for men

BLAST

THE stage of analysing the effects of blast on different systems of the body has now been reached In our issue of Feb 28 Zuckerman and his colleagues reported considerable progress in this difficult task The original demonstration that even deep seated pulmonary lesions might depend on the blow to the outside of the thorax had a direct bearing on protective measures, and in the same way the latest work promises information likely to influence treatment The actual force applied to the head is not usually sufficient to produce concussion That effects on cortical functions were seemingly slight is a tribute to the protective value of the skull, had the brain suffered a fraction of the injury seen in other organs further search for a cause of death would have been superfluous It is not quite clear how far protection of the ears prevents stunning, but its local beneficial effects are striking A direct effect of blast on the central nervous system cannot be excluded as a factor in the fall of blood-pressure which follows an explosion, but the extent and duration of the fall appear to be proportional to the extent of the lesions in thoracic and abdominal viscera, and the circulatory disturbance is therefore most probably caused by reflex and mechanical factors originating in these regions In animals the heart itself plays no part in the fall of pressure but this may not apply to man, in whom cardiac irregularities have been observed following thoracic injury

The lungs retain pride of place as the most significant organs in the syndrome but not—except in the most severe cases—by virtue of their primary respiratory function, they act rather as a particularly vulnerable part of the circulation One of the most interesting observations in this connexion is the fall of blood-pressure (in contrast to the usual rise) which, after blast injury, follows squeezing of the abdomen The authors believe this to be a reflex effect of the increased venous return which still further embarrasses a pulmonary circulation already obstructed by local injury If their interpretation is correct, they point out that treatment of the low blood pressure in man, by transfusion might well prove fatal, what the patient probably needs is venesection More study is wanted here, the reflex fall in systemic pressure which Daly and his colleagues obtained by overloading the pulmonary circulation in dogs[1] was not large, though of course the lungs of the animals in these experiments were otherwise normal The effects on respiratory function itself, and the records of vagal discharge during and after the exposure, indicate that injury stimulates the deflation receptors continuously, thereby giving rise to a more inspiratory average position of the thorax, while increased sensitivity of the stretch receptors leads to rapid shallow respiration This bears too much similarity to the findings in phosgene poisoning to be overlooked Laquer and Magnus, using the methods available in 1921, found that exposure of cats to phosgene led to increased sensitivity of the Hering-Breuer reflex[2], and clinical manuals refer to a feeling of constriction of the chest on breathing pulmonary irritants—particularly phosgene—which may well be due to continuous stimulation of the deflation receptors That both conditions often end in acute pulmonary œdema suggests an underlying common factor arising out of diffuse damage to the lungs

ILLEGITIMATE MOTHERHOOD

AMONG the methods of social psychiatry is that of investigating the life-history and psychological make up in a group with the same anomaly of social behaviour Studies of vagrants, prostitutes, boys or girls in Borstal institutions or approved schools, " lifers, ' house breakers and the like, published in Germany and other European countries, have demonstrated how the psychiatric factor, helped to advance prophylactic and therapeutic measures, *and in some cases influenced* legislation A monograph on illegitimate mothers by Binder[3] is based on the files of the bureau of official guardianship of the city of Basle Since 1912, 3000 illegitimate children have been notified, 350 of the mothers were invited to the outpatient department of the municipal *hospital* where they were interviewed and examined by the psychiatrist Their stories could be verified by extensive reports from the elaborate Swiss social and welfare services Manifestly psychotic cases were excluded from the group, but even so the mothers proved to be below average in respect of heredity, as well as in their mental equipment 16% were mental defectives, 22% psychopathic personalities and 25% neurotics Environment was equally inferior, only a tenth of the girls came from happy homes, two-thirds grew up under economic need Binder follows the course of events from the first meeting with the partner—who in a quarter of the cases never became known by name—through pregnancy and child birth, until the child is provided for He deals statistically with all the outer and inner difficulties of the mother's social and personal position, as well as with single cases The fact that the child lives in a family of which the mother is a partner in more than half the cases did not diminish the range of conflicts Of those interviewed 161 had their child ten or more years ago, which allowed for study of the later consequences of illegitimate motherhood As one would expect from a group of such poor mental quality, three quarters of the mothers had reacted with psychological disturbances to the event, some with transient abnormalities only, a third remained unbalanced mentally for life, half invalids unable to do their household duties, however small He discusses cautiously and conservatively the grounds for the legitimising of *abortion—a live problem* for the doctor in Switzerland where a new criminal code permits interruption of pregnancy if there is " great danger of permanent severe damage to the health of the mother " His claim that his group is unselected and representative may be questioned, *there* is good reason to suspect that

---

[1] Daly, I de B, Ludany, G, Todd, A and Verney, F B *Quart J exp Physiol* 1937 27 123

[2] Laquer F and Magnus, R *Z ges exp Med* 1921 13, 31

[3] Die Uneheliche Mutterschaft Hans Binder, M D lecturer in psychiatry University of Basle Berne Hans Huber Pp 378 Swiss francs 18

Pulse-rates and blood-pressures rose at the first session because the subjects were hearing noises which they associated with physical danger, by the third session they had learned to associate them with safety, and felt better about them in consequence. But presumably a few real raids would restore their former opinion. After all, the mere noises of war do not terrify when they are heard in a secure context, we have all attended war films in the peace years and though some might jump at the first loud pop, for the most part the noisy sequences caused nothing that could be classed as fear. On the other hand there is plenty of evidence that we can all get used to noise as noise—the man sleeping next door to the goods yard is the classic example—and by conditioning his civil defence workers against the mere nuisance value of the din Dr. Carver will have removed one component from the noise-fear complex.

Sir HENRY BRACKENBURY, who died at Yeovil on March 8, at the age of 75, will be much missed. His vast industry and forensic mind, which imperfectly concealed a warm heart, had been turned wholly towards the well-being of general practice in which his own life was spent.

Special Articles

THE ELECTRON IN BIOLOGY

ATTEMPTS have lately been made to explain various biological phenomena by applying to them a concept of atomic physics, the common energy levels possessed by electrons in crystalline solids. The atom is to be pictured as a system of negatively charged electrons revolving round a positively charged nucleus. Like the planets, the electrons move in elliptical orbits and also spin about axes of their own. The system being stable, the electrons continue to move without losing or gaining energy, so that when an electron moves in a certain orbit it possesses an amount of energy characteristic of that orbit. This energy depends roughly speaking on the size and shape of the ellipse and the orientation of its plane with respect to a fixed direction in the atom. There are only certain orbits, corresponding to certain energy levels, in which electrons can move round the nucleus without losing or gaining energy. This follows from application of the quantum theory* to the electron orbits of the atom, a procedure completely justified by experimental confirmation of its predictions. These permitted orbits, which are defined and identified by the quantum theory, form a system of energy levels differing by definite amounts. If an electron falls from one orbit to another of lower energy a quantum of radiation is emitted, its energy being equal to the difference in energy between the two orbits. Whether the radiation appears as X rays, visible or ultra-violet light, or heat depends solely on the magnitude of this energy difference.

The number of orbital electrons is determined by the chemical nature of the atom. The distribution of the electrons among the possible energy levels is governed by a second fundamental principle, the Pauli exclusion principle. According to this there cannot be more than two electrons in each level, and when there are two they must spin in opposite senses. With minor irregularities, the electrons fill up the orbits of lowest energy nearest the nucleus. The electrons can be raised to unoccupied ("virtual") levels when they become "excited"—for example, when they are bombarded by the rapidly moving electrons in a X-ray or discharge tube. The electrons in the outermost occupied levels are rather loosely bound to the atom, they are responsible for chemical combination between atoms, and are called the "valency electrons."

ELECTRONS IN A CRYSTALLINE SOLID[1]

The atoms in a crystal are arranged in a regular symmetrical pattern known as a "space lattice." The valency electrons are detached from their own atoms, and move freely in all directions through the lattice. This swarm of electrons is responsible for the conduction of electricity and heat. Forty years ago it was thought that the motion of these free electrons was similar to that of the molecules of a gas—that is, the energy was distributed continuously among them in a way which could be determined (as in the kinetic theory of gases) by statistical analysis. This Drude-Lorentz theory fitted in well with electrical and heat conductivities, but not with the specific heat of metals. In 1927–28 Pauli and Sommerfeld showed that the quantum theory and the exclusion principle must apply to the motion of the free electrons in a lattice just as they apply to the orbital electrons of the atom. Thus the motion must correspond to certain preferred energy levels, there can be only two electrons in each level and if there are two they must be of opposite spin.

A valency electron of an isolated atom moves round the nucleus in an orbit corresponding to a certain energy level. If the atom becomes part of a crystal lattice of n similar atoms, then in the simplest case the energy level splits up into n possible energy levels, each representing a state of motion in which the electron is no longer localised in the atom but moves freely through the crystal. Other virtual levels of the atom are now each represented by a group of n levels in the crystal. The energy spectrum, as it is called, thus consists of groups of levels, each group containing as many levels as there are atoms in the crystal, the groups being separated by intervals in which no levels are possible. When n approaches infinity each group becomes a continuum. The groups of allowed levels can be represented diagrammatically as bands, separated by intervals corresponding to forbidden energy. This applies to a simplified lattice consisting of a chain of equidistant atoms. In a real three-dimensional lattice the conditions are more complicated, and the permitted energy levels must be represented not in bands but in zones in space.

An electron moving through a crystal will continue with the same energy unless conditions arise which allow it to be transferred to another energy level. It could, for example, receive some of the heat energy of a lattice atom, or it could be accelerated by an applied electric potential difference, but on account of the exclusion principle it can only jump to a level which is not already filled by two electrons. Hence the possibility of an electron altering its energy is bound up with the distribution of the free electrons among the energy levels. This distribution decides whether a crystal is a conductor of electricity or an insulator. If free electrons can move into high energy levels they will accelerate under the action of an electric field and an electric current will flow, if the distribution is such that they cannot, the crystal will be an insulator. It is easy for an electron to change from one energy level to another within a band or zone, but very difficult for it to change to another band or zone. Indeed, for a crystal to be a conductor it may be necessary for the zones to overlap.

APPLICATIONS IN BIOLOGY

The system of energy levels makes it possible for an electron to receive energy at one point in the lattice, being raised to a higher energy level, and then, when it has reached some distant point, to yield up energy by returning to a lower level. Thus when a free electron becomes excited the whole crystal becomes excited. This is apparently what happens in certain phosphorescent substances, the "complex phosphors," which consist of a substance such as calcium sulphide activated by traces of a heavy metal such as bismuth. The absorbed light causes excitation of the "centres" (active complexes containing the heavy metal atoms) with expulsion of electrons. The delayed return of these electrons to the centres, with loss of energy and emission of light, causes the phosphorescence. However, the excitation of the centres is not due to the absorption of light in their immediate vicinity. On the contrary, the centres can receive energy which has been absorbed by the lattice from the radiation and has travelled to them through considerable distances, almost without loss. In 1938 Möglich and Schön[2] suggested that a similar well as in temperature In Dover it was possible to improve natural ventilation sufficiently to give satisfactory results, and it was found that dampness due to condensation could be reduced by placing low-temperature electric tubular heaters along the walls Sanitation in the shelters of the two towns differs considerably In Bristol, bin receptacles are used and are supervised and emptied regularly In Dover it has been possible to instal water-closets, and the authorities believe that the capital cost will shortly be offset by the saving effected on payment to contractors for emptying chemical closets Main water taps and sinks have also been installed, and reserve arrangements exist for installing chemical closets in case of emergency

---

* The quantum theory is fundamentally a law governing the exchange of energy between matter and radiation. Radiation (light, X rays, &c.) is not emitted or absorbed continuously but in minute discrete portions of energy (quanta). The energy of a quantum depends only on the frequency of the radiation.

[1] See, for example, Wilson, A. H. Semi-Conductors and Metals, Cambridge, 1939.

[2] Möglich, F., and Schön, M. *Naturwiss* 1938, 26, 199.

SUDDEN DEATH

THE layman is satisfied by the formula "heart attack" for the man who drops dead in the street, but the how and why are only now beginning to emerge The sequence is all too well known An apparently healthy adult complains of "indigestion"—slight substernal oppression or pain, often not particularly well localised and often accompanied by flatulence Examination reveals no definite abnormality, the blood-pressure may be rather low for an adult, but without previous records to act as a control little significance can be attached to this, there may be some extrasystoles, but we have been taught for several generations that extrasystoles in themselves are of no significance, the patient may be rather dyspnœic, but who has not seen some dyspnœa in a rather obese adult with flatulence? So a reassuring verdict is given, and several hours or possibly days later the patient suddenly drops down dead Three questions confront us what is the underlying mechanism responsible for this tragedy, what could we have done for the patient, if anything, and how can other cases of the kind be detected?

These patients probably die either from rupture of the heart or from ventricular fibrillation due to myocardial infarction arising from coronary occlusion or acute coronary insufficiency Differentiation between the last two conditions is important For many years coronary occlusion, with its characteristic clinical and electrocardiographic features, has claimed the more interest, but attention is now turning to acute coronary insufficiency Master and his colleagues[1] have shown that myocardial infarction may result from acute coronary insufficiency in the absence of coronary occlusion or even coronary sclerosis In a series of 48 cases which came to necropsy they showed that in coronary insufficiency the myomalacia was focal and disseminated, and they claim that in life the electrocardiographic changes—depression of the RS-T segment and flattening or inversion of the T wave in two or more leads—are usually characteristic From their observations in patients who survived they are of the opinion that the symptoms may either be very mild, similar to a mild attack of angina pectoris, or so severe as to leave no doubt that the patient is having a "heart attack" They found the characteristic electrocardiographic changes equally in mild and severe cases LeRoy and Snider[2] have demonstrated how such coronary insufficiency may cause sudden death, even though the pathologist may be unable to find adequate cause in the myocardium In 10 cases of sudden death investigated in a coroner's court they found at necropsy a large infarct in the left ventricle ruptured in 3, in 3 others there was no discernible infarction of the myocardium, and in the remaining 4 the infarct was small—no larger than the healed fibrous areas so often found in the myocardium Impressed by these findings they then carried out experimental work on dogs, suddenly occluding the circumflex branch of the left coronary artery by ligature Their essential finding was that such a procedure was followed by generalised coronary vasoconstriction, which in turn was followed by ventricular fibrillation, this confirmed the observations of workers in Toronto[3] They also found that when death occurred suddenly—within 30 minutes—no infarct was visible afterwards Though unable to explain why coronary vasoconstriction should cause ventricular fibrillation in only a proportion of cases, they insist that steps to prevent the onset of fibrillation should be taken in every clinical case where coronary disease is suspected They found that atropine sulphate reduced the mortality in their animals from 75% to 35%, while the xanthine derivatives reduced the mortality to 25%, light anæsthesia with morphine and pentobarbital sodium was altogether ineffective though with pentobarbital sodium alone the mortality was only 20–30%

These findings suggest provisional treatment for clinical cases absolute rest in bed, accompanied by the administration of atropine sulphate and aminophylline (theophylline with ethylenediamine) The dosage recommended by LeRoy and Snider, and supported by Pardee in the discussion of their paper, is gr 1/75 of atropine sulphate intravenously followed by gr 1/100–1/150 at 4–6 hourly intervals, while gr 7½ of the xanthine preparation is given 4 hourly The doubt thrown on the value of morphine in such cases unless accompanied by atropine is noteworthy It is not easy to say how cases are to be detected, but clearly every patient with symptoms at all suspicious of coronary disease should be examined for arrhythmia, fall in blood-pressure and electrocardiographic changes The anoxæmia test,[4] in which coronary-artery disease is indicated by the electrocardiographic response of the patient to controlled inhalation of low concentrations of oxygen, may be useful Some patients will doubtless be treated unnecessarily but their inconvenience should not weigh against the advantage to those who would otherwise die We may be entering on a fresh era in the diagnosis and treatment of coronary disease, which will to some extent counterbalance the increasing mortality from what has been aptly named "the artery of death"

CONDITIONED TO BANGS

BABIES, we are always told, fear nothing but bangs and being dropped The rest of us, our pristine stoicism shattered by experience, fear plenty and preserve a dislike of loud noises into the bargain Savages, aware of this human weakness, go shouting and drumming into war, while the civilised races favour shrieking bombs Dr A E Carver[5] thinks that if we could condition ourselves against the fear of noise, air-raids would lose a great part of their fear value Cows, he points out, when placed in a field alongside the railway, for the first few days gallop off whenever a train passes, after that, having become conditioned to the noise, they take no notice and go on grazing He suggests that all civil defence workers should be trained to discount the din of air-raids by attending "blitz concerts," recorded for the gramophone, and played over to groups or relayed over the wireless He has made experiments along these lines on workers, villagers and patients in the extensive cellars of Caldecote Hall In the first experiment doctors, observing groups of six subjects each, found that the blood pressure rose on an average 16 mm Hg and the pulse-rate 13 per min By the third concert the average blood-pressure rise was only 6 mm and the pulse-rate rise 8 The idea, though a good one, may be fallacious Surely the cows in the field became conditioned to the trains because experience had shown that the noise was not accompanied by danger And the same conditioning was at work in the cellars of Caldecote Hall his duty did he not permit his pupils to pay a conducted visit to the cherry blossom or the wistaria when in full perfection. There is some difference between the unashamed acknowledgement by the Oriental of the æsthetic beauty of the cherry blossom or the almond and the unexpressed and dull, though maybe heartfelt, admiration of the average stay-at-home Englishman for the beauty of the wild flowers of his countryside. It would almost seem as though it needed some separation from them, some loss of familiar scenes of gorse or heather, of bluebells or hawthorn, to make him realise the real beauties of his homeland's wild flowers. With the realisation of this difference there comes another thought. The Oriental admires a perfect flower, a perfectly blooming tree, a beautiful flowering creeper when grown in perfection. To any of these he will make pilgrimage, and see to it that the children of an impressionable age are permitted to share in the æsthetic pleasure. But this delight in flowers is not extended to those field flowers, beautiful though they may be, that intrude upon the holdings of the small cultivator. The pity of it all is that in England there seems to be tolerance of weeds invading agricultural land. To one who looks at agricultural England from the windows of a railway train upon a familiar journey, made after an absence of thirty years, the spread of weeds appears as a national calamity. There arises the question: has the Englishman in his dull acceptance of the beauties of our native wild flowers passively acquiesced in the presence of weeds in all his cultivated lands? Or has he permitted this thing because he is too insensitive to realise the threat of it all, or too lazy or too careless to deal with the menace? I cannot decide upon this point, but the vast encroachment of weeds upon plough and pasture in England has, during the last thirty years, developed almost to riot proportions. It is a pity that the rapidity with which a weed may spread under the favourable conditions of human neglect and the coincidence of the requirements of soil and season is not realised by those at home. The lesson of Salvation Jane, of soursop, of stinkweed, St John's-wort, Bathurst burr and all the rest of them seems to be lost upon the agricultural authorities. The example of the prickly pear infestation means nothing to those who live in England since the whole thing is so remote, so outlandish and so utterly unbelievable; nevertheless it is a lesson that cannot be neglected. When this pest was at its maximum in Queensland and New South Wales it was claiming three fresh acres *every minute* in the year and had already overrun some 30 000,000 acres. Our thistles, docks, ragworts, knapweeds and yarrows can show no such dramatic successes as those obtained by *Opuntia inermis*, but we seem to give them every opportunity to show us what they can do in the way of ruining plough and pasture in England and thus lowering our production of food. Into my open window drifts a stream of thistledowns and dandelion fluffs as the wind stirs them along the railway cutting. Their mission is unfulfilled, but the remaining millions of their fellows will have a happier fate and settle upon land newly ploughed. Surely this flight of the thistledowns and the overgrowth of the hedgerows, whose unkempt bottoms provide a constant supply of new recruits to the invading army, furnish a lesson in which the initial factor—human neglect—only needs to be supplemented by soil and season to impress us with the reality of the invasion. Perhaps the promiscuous ploughing of land in weed-infested areas will provide the second factor, and we may yet see what the weeds of England can do when human folk has offered them the best conditions for multiplying.

---

[1] Master A M, Gubner R, Dack, S and Jaffe, H L *Arch intern med* 1941, 67, 647

[2] LeRoy, G V and Snider, S S *J. Amer med Ass* 1941, 117, 2019

[3] Manning, G W McEachern C G and Hall G E *Arch intern Med* 1939 64, 661, McEachern, Manning and Hall *Ibid*, 1940 65 661

[4] Levy, R L, Patterson, J E, Clark, T W and Bruenn, H G *J Amer med Ass* 1941, 117, 2113

[5] *Med Offr*, 1942, 67, 37

* * *

Some time ago I was listening to Mr Priestley's dreams of the future for squalid, industrial Hopetown—municipal restaurants, dance halls, theatres, river life. His northern accent reminded me of my last real holiday in August '39 when I camped with some lads from Huddersfield, to my ear a most attractive sound—attractive, yes, but definitely barbituric. Is that the word?

"Who are you?" A bronzed young man, clad only in a pair of shorts, is looking down at me—keen, slightly superior, capable. "I'm an H.P.," he answered, "and I've come to tell you about our show here." We were on the shores of the Wash; it was low tide and long stretches of sand met glistening water in the distance, and this in turn faded into the greyness of the sky. In the immediate foreground a number of little children played on the sand. "H.P.?" I asked drowsily; I think I must have been asleep. "Yes, H.P. at the Exanthem Holiday Home—Hopetown's experiment, you know." "From Hell Hull and Hopetown," I quoted rather tactlessly. "Quite. I believe they used to say that. Well, the idea is that before a child starts school, he comes down here and has all his fevers under ideal conditions." He turned from looking out to sea and pointed to a group of huts along the coast, right on the edge of the sand. "That's where they spend their first fortnight, practically an ordinary seaside holiday, paddling and playing about on the sands and with a very generous diet. Then they go to that group of houses you see there, slightly inland; Morbilli Mansions, we call them. There they have their measles, controlled, of course, by convalescent serum taken from the last batch." "How do you infect them?" I asked. "By nose to nose swab from selected mild cases. We do it on the fifth day after their arrival from Hopetown. Very few of them are really ill with it, and after a fortnight there they go on to the Rub-mumps Wigwams—the chalets over there—where they have their rubella and mumps together. They are infected with these half way through their measles, by nose swab for rubella and infected bedbugs for mumps. Our strains are very mild and they rarely have to go to bed. Three weeks there and then they go on to the Scardipty Bungalows, where they are immunised against scarlet and diphtheria and have a shot of TAB. You can see them, under the trees close here and these children come from them. After that they go to Pertussis Castle—that long loggia there—and they are vaccinated at the same time. Supposed to help the cough, you know, not that it is ever severe as we control it with vaccine. They finish up their three months at Whoopee Court, that large white building. Glorious place—roundabouts, vitamin ice-creams and donkey-rides. The only thing that happens to them there is their 2nd antidip and TAB injections, and incidentally they are taught to swim." "H'mph," I said, "I don't know that it is quite my idea of a holiday." "But they have a wonderful time", he wagged a large brown finger at me. "Let me give you a few statistics. It is calculated that the average time saved for education is equivalent to postponing the school-leaving age six months. The average increase in weight in the three months is 9 lb., and we've never had a complication!" "Never a complication?" I gasped. "Liar!" The young man gave me a slighting glance and walked rapidly out to sea. Barbi—barbituratic, that's the word.

* * *

One of the disadvantages, insufficiently stressed I think, of growing older is that one's professional opinion commands, or appears to command, an increasing measure of respect. When I was a young doctor and knew some medicine (or thought I did) there were certain foolhardy spirits, usually elderly females, who dared to challenge the accuracy of my diagnoses ("That's not measles, doctor, you can take it from me. I had my six all down with it at the same time and I ought to know"). Now, in middle age, this seems to happen no longer and even my most pompous imbecilities ("chill must be avoided at all costs") are received with gravity. This undue reverence for my mind is extended to my even less impressive body; boys and sometimes girls—not always prompted by parents either—open gates or carry bags for me, stand up when I come in and call me "sir" or "doctor" with damnable iteration. The numerous evacuated preparatory schools I "look after" are a perpetual reminder of the same thing. I am constantly passing one or another of them walking in crocodile along a country lane, and, at the mere sight of my car in the distance, the conditioned reflex begins to operate; the hands of the leaders go up and one after another the little caps are peeled off the little heads. Bowing and gesturing gracefully with my disengaged hand I have to drive slowly past. "No good asking that old fool, he's past it," will, I suppose, be the next stage. Well, it will be almost a relief when it comes.

mechanism might be at work in certain biological systems Thus in photosynthesis some 2000 chlorophyll molecules form a functional unit, and it seems that for a CO_2 molecule to be reduced within this complex four quanta must reach it simultaneously Since these quanta will have been absorbed independently in the chlorophyll complex, it is clear that the existence of common electronic energy levels within the complex would provide a plausible mechanism Moglich and Schon suggested that this concept applies also to gene mutation induced by irradiation

This idea, that giant organic molecules or complexes contain a free electron system similar to that of crystals, was extended by Jordan[3] with respect to genes He also suggested its application to enzymes The enzyme urease is inactivated by ultraviolet light, and the inactivation at different wave-lengths is proportional to the amount of light absorbed at that wave-length Theoretical considerations, however, make it unlikely that the enzyme can be directly inactivated by radiation of the frequency of ultraviolet light Jordan resolved this difficulty by an explanation based on the assumption of energy bands in the enzyme molecule, similar to those in a crystal

In a lecture a few months ago Szent-Gyorgyi[4] emphasised the importance to biochemistry of the concept of electronic energy levels, and remarked, "The more interesting question, however, is not whether common energy levels exist within one molecule, but whether protein molecules can join into more extended systems with common energy levels" If this be possible, he suggested, various puzzling phenomena can be explained Thus the energy of muscle contraction is derived from the breakdown of adenosine triphosphate Myosin, the contractile substance, itself appears to catalyse this breakdown, but it seems that only a small fraction of the myosin molecules are active in this way The energy liberated by one molecule has clearly to be transmitted to a great number of similar molecules, and a mechanism for this would be provided by common energy levels They would also explain how the enzymes of oxidation interact in cell respiration These enzymes are insoluble and bound to the insoluble cell proteins, and the electrons wander from enzyme to enzyme This seems impossible on spatial grounds, and Szent-Gyorgyi suggests that the enzymes are connected with different energy levels, and that each electron travels within an energy band, falling to a lower level and giving up energy only at a place where work can be done, as in the phosphorescent substances already mentioned He also suggested that the existence of common energy levels in the cell would explain the great biological activity of certain compounds one single crocin molecule, for instance, can induce a sexual change in a whole alga

Baxter and Cassie,[5] who have studied the electrical conductivity of wool, have found that wool of a certain moisture content behaves as an electronic semi-conductor (The conductivity of a semi-conductor depends on the presence of impurities, and varies with temperature in a way different from that of ordinary metallic conductors [1]) Their findings were consistent with the existence in the moist wool of electronic energy bands separated by forbidden zones It seemed that the conducting system was the water adsorbed on the wool surface, so that the energy-band system would belong to adsorbed water molecules They suggested that the electronic transfer of energy in biological systems might take place along layers of water molecules adsorbed at interfaces such as cell walls , Szent-Gyorgyi had indeed suggested that the cell wall is "the border-line of the common energy-levels"

Caution is still necessary here The existence of electronic energy-levels in crystals rests on a mathematical and experimental basis, whereas their existence in biological systems is at present merely an attractive hypothesis advanced to explain certain puzzling phenomena This hypothesis should not be indiscriminately invoked before the existence of the levels has been established by experiment The work of Baxter and Cassie may indicate one method of approach

---

[3] Jordan, P *Ibid*, p 693

[4] von Szent Gyorgyi, A *Science*, 1941 93, 609 , *Nature, Lond* 1941, 148, 157

[5] Baxter, S and Cassie, A B D *Ibid*, p 408

In England Now

A Running Commentary by Peripatetic Correspondents

MY old missis says—if Mr Damon Runyon will allow me to put it thus—that we feed better since the rationing has begun, and she thinks it is because we put more thought into it But that is not all It is partly because she has got rid of the servant, and partly because we live in the country Love in a hut with water and a crust may be cinders, ashes, dust , but life in a cottage with a vegetable garden and a good cook is just about the acme of excellent feeding It is in "Allan Quatermain" that Rider Haggard describes the little Frenchman who was always telling the story of his grandfather in the retreat from Moscow and who was such a wonderful cook that Allan Q felt certain that had he got at them his grandfather's gaiters would have appeared at the mess as an excellent ragout But the Frenchman was not in it with my missis Monday, instead of being cold meat day, has always been an adventure at the time of the evening meal, for that was the servant's day out and the missis combed out the refrigerator and larder, and the gleanings came on the table in different forms but always savoury Now that she is doing it herself and putting more thought into it, it's always Monday evenings That's not quite all The kitchen at the cottage is a lean-to outside the sitting-room that used to be a cowshed The distance is so small that everything comes on the table hot, and besides it is not dished-up Direct from the saucepan to the plate with all vegetables, gravies and sauces , and even these are put on a little electric heater that warms the cowshed As for mushrooms, it's the only way to eat them, but we are wondering whether when we have these next year we will not take the dining-table into the lean-to kitchen Let this be a warning to those who are losing servants, as many must with the need for young women in the Services Don't try to use the dining-room , feed in the kitchen and have your meals hot That is the slogan for food war

* * *

Of all those Englishmen who have left their familiar countryside to find a home amid the botanic riot of the tropics, few, I am sure, have ever forgotten their first loves—the wild flowers of the fields and hedgerows of their homeland Few can have been so disloyal to their native hillsides abloom with heather or their downs ablaze with gorse as to have regarded the tumbled masses of bougainvillea, the riot of thunbergia or even the temporary enchantment of orchids in the wild as being the more satisfying displays of floral splendour A wreathing mass of bougainvillea in full purple bloom about a giant tree is indeed a sight to marvel at The dwarf azalias flowering through the melting snow on the mountains of Japan, the wattle in full bloom in Australia, the wild profusion of the flowering cassias and the flame tree and the generous abundance of the hibiscus in the tropics are all sights that can never be forgotten The rare bloom of desert places, the almost malignant scarlet and black carpet of Sturt's desert pea covering acres in Central Australia, the pink parakelia and the pink and white everlastings clothing the sand hills for miles in ephemeral luxuriance are sights to gasp at when seen on a sudden in a desert journey No one who has seen it in the brief interval between dusk and dawn, when its virginal beauty is in perfection, can ever forget the night-flowering cereus as it tumbles in grotesque but beautiful riot over some Hawaiian stone wall Yet when all is said, when all the lavish beauty of tropical blossom has had due homage paid to it, the exiled Scotsman hankers for his heather clad hills—even his thistles—and the Englishman recalls lovingly the gorse-strewn downs and all the lesser beauties of the meadows and hedgerows The Briton at home regards the native wild flowers of his countryside with some unacknowledged pleasure He would not confess to any open avowal of their æsthetic beauty as does the Japanese No educational authority in England would give the school-children holiday in order that they might be taken by their teachers to admire a hawthorn in full bloom Yet in Japan the schoolmaster would fail in

STUDENTS IN UNIFORM?

SIR,—Perhaps you will let a clinical student, who is also a member of the Home Guard, express his opinion of your peripatetic correspondent's proposal to conscript all medical students and put them in uniform, so as to avert "the inevitable attitude of strangers" This would be an undesirable and wasteful piece of pretence, designed to avoid an unpopularity which scarcely exists Your correspondent is surely mistaken if he supposes that the white-feather attitude is shown on more than negligibly few occasions In two and a half years of war I have never been given a white feather and have only once had a remark of the white-feather sort addressed to me That was by an obviously neurotic woman, who would have said anything to anyone, and to whom I had just spoken tactlessly I wear no kind of badge Even if this attitude were less rare if any future doctor is going to be seriously upset by it I am sorry for him when he meets his less rational patients As for conscience, it is a poor sort of conscience which would be satisfied by being put into a bogus uniform and then sent back to live as before

When we are conscripted, are we to have our clothes, board, lodging and tuition provided free, like everyone else on full-time compulsory service, or are we to be conscripts who must find our own living and have fifty pounds a year in fees levied from us?

Enfield　W J PENMAN

SIR,—With the progress and spread of the war, I suppose it was inevitable that some suggestion such as those offered by two of your contributors concerning the military status of students should be made Both suggested that a move to place students in the Army from the outset, and then release them subject to periodical drill to continue their studies, would be welcomed by the students themselves I do not doubt the accuracy of the impression which your contributors, from their position as teachers, have obtained of student feeling, but there is a view which they neglect, and which is more widely held than they perhaps realise

The vast majority of us who are now at hospital must have seen war coming since we left school Many intending medical men felt that participation in it was the best service they could offer the country and joined the Army instead of going to hospital But others of us chose the medical profession in spite of, or rather by reason of, the world situation, because we felt that the profession of arms had no place in our conception of serving humanity

Professor Ryle, I think it was, said once that medicine was the only neutral profession We feel that our conception of its place in the world involves the maintenance of that view It is natural and easy to dismiss considerations of this kind as sentiment, and I have already been told by one respected teacher that in an invasion it would be our duty to abandon our charge and take to the woods as guerillas—and further that he personally would refuse to exercise his skill on a German If medicine is to retain any of the catholicity which has so far maintained it, and whose abandonment in Germany we so much deplore, this sort of view ought not to be spread As junior students we have no right to dogmatise about professional ethics We feel our job to be the study of healing, not killing, and we would regard any adopting of uniform, arms drill, and so forth, as a good reason for abandoning the profession I trust that your contributors will bear this minority view in mind when they advocate any legislation The tradition of medical neutrality is the fruit of years of courageous endeavour, and once it is destroyed it will certainly not prove easy to reinstate

Brentwood　ALEX COMFORT

TREATMENT OF BURNS —An article in the *Deutsche medizinische Wochenschrift* for October, 1941, describes the treatment of burns with a eucerine ointment containing 10% 'Albucid' The anhydrous eucerine is said to be valuable for its absorptive and cooling properties In addition two tablets (gr 15) of albucid are given three times a day for five days Judged on the rapidity of epithelial repair this is said to be a great advance in burn therapy

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS M P

Major Lloyd George the parliamentary secretary to the Ministry of Food, had a satisfactory statement to make to the House on the food situation of this country last week In essential foodstuffs we are safe and the reserves of essential foods were 30% better at the end of December, 1941 than they were in December, 1940 But the future is dominated by the shipping position and every ton of shipping space which can be saved is vital It may be therefore necessary to reduce some of the existing rations The problem is one of survival not of optimum nutrition Although Major Lloyd George did not say so this means less meat and sugar and a restriction of milk to adults in order to safeguard it for children and special classes of the community It may mean more severe restrictions No more tinned fruits are to be imported but there are supplies of dried fruits and will probably be more Eggs may be maintained at their present level It was suggested that with a better mobilisation of the productive resources of the small man the egg position might even be improved In any case we were assured that "the nation will be adequately fed and neither our health nor our morale will suffer"

A central feature of the debate was the national loaf In the last war Mr D Lloyd George made its use obligatory and it has been adopted in other countries during this war Sir Ernest Graham-Little made out the case for the whole wheat including outer husk or bran endosperm, which is 90% of the wheat and almost wholly starch, and the germ containing the bulk of the vitamins the greater part of the minerals, especially iron and phosphorus, and which is richest in protein and fat The committee of the M R C which advises on food is in favour of bread made from this flour and Sir Ernest said it had the support of the vast majority of scientists Nevertheless "for two and a half years the people of this country have been fed on bread which is almost entirely composed of starch" The addition of vitamin B_1 to bread is expensive and inadequate and the addition of minerals has not been made The use of this whole wheat in bread would save 700 000 tons of shipping a year, which is "as much as we could possibly build on the shipping stocks today in a whole year's work" according to Mr Clement Davies The needs of shipping and the needs of nutrition thus run parallel and the argument that the adoption of whole-meal flour would mean a loss of cattle food is not weighty The loss would represent only 2 2% of the cattle food imported and could be more than made up by the scientific use of silage

Sir Ernest connected the rise in the tuberculosis death-rate with our failure to use whole-meal bread and drew attention also to the epidemic of gingivitis How far the fact that 80% of men in the Army have dental caries is the reflection of the white bread habit is not known Dr Haden Guest suggested priorities in the general rationing scheme—Services and productive workers coming first then sedentary workers (including members of parliament), and last of all non-producers as the lowest scale

Sir Ernest Graham-Little is supported by over eighty members of the House in his campaign against the milling interests who prefer to produce white flour Among these M P s are Prof A V Hill, F R S, Sir John Graham Kerr F R S, as well as six medical M P s

* * *

The House of Commons Trade Union Group invited members of the Labour Party to hear Mr E A Nicoll, F R C S E, of Mansfield, give an address on fracture treatment and rehabilitation and to see a film of the men under treatment Mr Nicoll's rehabilitation centre deals exclusively with coal-miners from the Midlands, and 80% of his patients are restored to full working capacity at an early date and a further 15% after longer treatment This combination of scientific fracture treatment followed when required, by rehabilitation with a social organisation working for and with the men and employers on the side of health and efficiency impressed the M P s, and several arrangements to send on the experiments of Savoor and Lewthwaite If their findings were confirmed by future work we should be confronted with a serious complication in the laboratory diagnosis of the tsutsugamushi type of typhus fever, which is prevalent throughout the Far East Not only would the agglutination test with *Proteus OXK* suffer a serious loss of its diagnostic value but the same would of course apply to agglutination or complement-fixation tests with the corresponding rickettsiæ

Emergency Public Health Laboratory Service, National Institute for Medical Research A FELIX

DIAGNOSIS OF EMPYEMA

SIR,—Although it is generally well recognised that in neglected cases of empyema thoracis bulging of the intercostal spaces may occur before the pus actually points under the skin, it is not so widely known as it should be that the diagnosis of empyema can usually be made on inspection or palpation quite early in the progress of the disease On inspection, especially with oblique lighting, the intercostal spaces are much less obvious than those of the unaffected side and the contours of the chest wall on the affected side are somewhat blurred On palpation, again, the normal ridge and furrow structure of the chest wall is, to a certain extent smoothed out and the intercostal spaces impart to the finger a sense of fullness and rigidity There is also less than the usual respiratory reaction in the intercostal spaces on the affected side

These signs are probably not due simply to an inflammatory thickening of the parietal pleura with overlying œdema as they may be found in cases which, on aspiration, are shown to be suffering merely from hydrothorax It is suggested that the rigidity of the intercostal spaces may be homologous with the rigidity in the abdominal wall accompanying irritation of the underlying peritoneum These physical signs are very constant and may be a valuable indication of a developing empyema

Oxford D A ABERNETHY

CHILDREN'S OUTPATIENT PROBLEMS

SIR,—The Government are to be congratulated on having supplied free vitamin C, in the form of blackcurrant puree and rose hip syrup, at the welfares and also vitaminised preparations to children under two years The children I see at outpatient departments, both in London and at hospital out of London, have benefited greatly through this innovation It is a pity, however, that at least the vitaminised oil is not available for children between two and five years It is at this age where one sees signs of malnutrition In my opinion the immediate extension of the age-group for these vitamins is strongly indicated

Another serious problem of outpatient departments is the disposal of mentally defective infants and children, for whom the accommodation available is totally inadequate Women who would be available for war service are forced to remain tied to a hopeless mental defective, and such a child is a nuisance in every way in billet or temporary surroundings Some additional facilities are urgently needed One notices children who scream unduly at the outpatient departments when being examined Invariably the report is heard from the mother "Oh, he's screamed ever since he had his diphtheria immunisation" As a whole-hearted advocate of immunisation, I would suggest that it should be done during the first year of life, when this fear of doctors would soon be forgotten

Devonshire Place, W 1 DONALD PATERSON

SULPHONAMIDES AND ENTERIC FEVERS

SIR,—In contrast to my experience Dr Russell is unfavourably impressed by the effect of sulphapyridine in a case of paratyphoid fever He started treatment on the sixth day, but according to his notes discontinued it after he had given 4 5 g of sulphapyridine within 2½ days He does not say why he discontinued the treatment except that the earache about which the patient complained, had ceased When he started treatment again on the eleventh day it did not influence the course of the disease I do not see from his notes how the sulphapyridine made the position worse except in causing vomiting He did not give the drug a fair chance to do good It appears to be one of the essentials in treatment with sulphapyridine to give sufficient doses for a sufficiently long time In my case when I reduced the dose on the third day to 3 g a day the temperature shot up again and only after returning to the large doses did I succeed in aborting the infection When Dr Russell started the treatment again on the eleventh day the bacilli had apparently already settled in the lymph apparatus of the intestine, and so had become less accessible to a sufficient concentration of the drug In my opinion sulphonamide treatment of paratyphoid and probably typhoid fever has only a chance as long and as much as the infection is in the blood, when the bacilli accumulate in the lymph apparatus of the intestine they become inaccessible to chemotherapy

London, W 9 FRITZ MULLER

CALLING IN THE SURGEON FOR PEPTIC ULCER

SIR,—In an otherwise helpful and well informed leading article in THE LANCET of March 7 you assess the mortality of partial gastro-duodenectomy for duodenal ulcer as 5–10% You suggest that the figure of 3 9% for the Mayo Clinic cases in 1940 is the best hitherto reached This is not so, for the mortality is continuously falling, as Walters has shown (Walters et al *Trans Amer Surg Ass* 1941, 59, 266) In the discussion of this paper F A Lahey declared that he had performed the operation 154 times with one death only, and that due to a pulmonary embolus Four years ago (*Surg Gynec Obstet* 1938, 67, 495) I reported 118 resections for duodenal ulcer by the anterior Polya method with one death (0 86%) But before this Finsterer had published a series of about the same size in which the mortality was, I think, 1 5% If the higher figures are accepted as usual surely the best should not be passed over But there is no need to regard a low mortality as a necessarily *exceptional* thing The technique of the operation has been well worked out and can be communicated to any surgeon of ordinary technical ability

The reluctance of English clinicians to recognise the great success of gastro-duodenectomy may perhaps be related to the implacable opposition to the operation by that great master surgeon Moynihan and his contemporaries at the Mayo clinic Eight years ago, as a result of experience, I was advocating it as the standard procedure for duodenal ulcer resistant to medical measures At that time general opinion in this country and in America was against it But now in the latter country reports are coming in of lasting cure in well over 90% of patients with duodenal ulcer where the antrum and pylorus have been removed In 1938 (loc cit) I also stated that the Billroth I operation had been given up in my clinic because of its higher mortality and less satisfactory distant results It is interesting to note that Walters and his collaborators in 1941 have come to the same conclusion

No rational surgeon can believe that so extensive an operation for so small a lesion will be the final solution to this great problem But while our knowledge of the true nature of duodenal ulcer is so lamentably deficient the operation is the only known method by which patients may be restored to such health that they need never think about their diet and can perform hard work

Basingstoke CHARLES A PANNETT

MEDICAL SUPPLY OF RADON

SIR,—*There is a natural desire* among all those who have responsibilities in the matter of radium or radon supplies to maintain as far as possible the high standard of practice in radium therapy which had been reached before September, 1939 There is, for obvious reasons, less actual treatment now with radium, but more is being done with radon, which however carries with it the same risks as radium in treatment The National Radium Commission and the Medical Research Council are largely responsible for the radium used as the source of radon at two of the radon centres, both which I have the honour of supervising It has been agreed that radon will only be supplied to those hospitals which are on the official list of the National Radium Commission Hospitals not on that list, and which desire to obtain supplies, should obtain from the National Radium Commission a questionnaire which, when completed, should be sent direct to the commission, c/o Westminster Hospital, London, S W 1 In due course the hospital will be told whether its name has been placed on the official list and what steps should be taken to obtain radon

SIDNEY RUSS

admission to an approved society (In answer to a further question the Secretary of State for Scotland gave a similar assurance on behalf of his department)

Alien Nurses

Mr David Adams asked the Minister if he was aware that the General Nursing Council, acting under the Nurses Registration Act, 1919 had refused to excuse women of friendly alien origin, being trained nurses who wished to become state registered nurses in England, any portion of their training, and had insisted that they must complete the whole course of training including the preliminary examination, and whether, in view of the serious shortage of trained nurses in EMS hospitals, he would ensure some temporary modification during war time of the act —Miss F Horsbrugh replied I am aware that no provision is made in the Nurses Registration Act for the exemption of nurses trained in foreign countries from any part of the training needed for State registration in this country Such nurses can be employed as assistant nurses The answer to the second part of the question is No —Mr Adams Is Miss Horsbrugh aware that medical men and women of friendly alien origin were being eagerly employed in our hospitals as doctors and surgeons, and did she not consider it was a waste of excellent woman power to insist that these fully qualified and well-experienced nurses should begin as juniors in our hospitals—a position which they would not accept ?—Miss Horsbrugh Perhaps Mr Adams had not realised that the ministry was not suggesting that they should begin as probationers and student nurses but that the rank of assistant nurse was more suitable for those who had not completed the full course of registration

Miss Rathbone Will the Minister give attention to the question of nurses who are enemy aliens but who objected to the Nazi régime ?—Miss Horsbrugh It is not the fact of being aliens but the training they have had, and whether they should be classed as assistant nurses or student nurses or fully state registered nurses

Tuberculosis in Mental Hospitals

Mr J Parker asked the Minister what action he proposed to take in view of the 40% increase in deaths from tuberculosis in mental hospitals already shown in the figures for 1940, and whether such action would include the X ray examination of all residents in mental institutions so as to discover the incipient cases of tuberculosis before this disease reached dangerous proportions in these institutions —Miss Horsbrugh replied The incidence of tuberculosis is being closely watched by the Board of Control, and, so far as is practicable with the greatly depleted medical and nursing staffs, radiological examination and other modern methods of diagnosis are being employed to detect incipient cases

Scientific Adviser to the Ministry of Food

Prior to Jan 1, 1942, Mr T Moran D Sc, director of research for the Flour Millers' Research Association, was lent by the association to the ministry for part time service as deputy scientific adviser Since that date Dr Moran has been lent by the Flour Millers' Research Association to act as chief technical officer of Flour (Accessory Factors) Ltd., the company which has been formed by the ministry to undertake commercial and industrial activities in connexion with the production of *aneurine* in this country and its introduction into white flour Final arrangements in connexion with Dr Moran s services in this capacity have not yet been completed, but it is hoped that his services will continue to be available to the ministry in an honorary capacity (Major Lloyd George replying to Sir Ernest Graham Little)

Fortification of Canadian Flour

Major Lloyd George informed Sir E Graham Little that the fortification of Canadian flour with vitamin B_1 before export to the United Kingdom is not carried out by the Canadian government but by the individual millers These millers purchase their supplies of the vitamin from Canadian manufacturers and the extra cost of the flour due to reinforcement is approximately 10*d* per sack of 280 lb Consignments of Canadian flour are sampled on arrival in the United Kingdom and the vitamin B_1 content of the sample is determined by the same kind of test that is applied to home milled flour

Surgical Limbs

Mr F J Bellenger asked the Minister of Pensions whether, in order to illustrate to the public the considerable development that had taken place since the great war in the manufacture of surgical limbs, he would arrange to have a cinema film made of the work being carried out at His Majesty's artificial limb depots —Mr W Paling replied The Minister is already considering whether a cinema film can be arranged For the information of members of the profession the chief limb fitting surgeon of the ministry has delivered a series of lectures throughout the country and is about to begin a second tour

Retail Chemists

Sir Thomas Moore asked the Minister of Supply if he was satisfied that essential medical supplies were available to members of the public in all retail chemists —Mr Charles Peat replied The total quantity of essential medical supplies is sufficient to meet national requirements and there is no evidence of shortage in supplies to retail chemists

---

SCOTLAND

SCOTTISH ORTHOPÆDIC COUNCIL

The Scottish Orthopædic Council was inaugurated on March 3 at a luncheon in the North British Station Hotel followed by a meeting in St Andrew's House Edinburgh The purpose of the council is to coordinate the work of the recently formed Regional Orthopædic Councils or Cripple Welfare Associations and to secure a national scheme for the prevention treatment, training and welfare of cripples It was announced that the Queen had consented to become patroness of the council The chief guest was Dame Agnes Hunt Sir John Fraser, the first chairman of the council said that there had been occasions when the critics of Scottish affairs had pointed at them a finger not altogether unfriendly but rather sorrowful and had reminded them that there was a blot on their escutcheon in the matter of orthopædics and the care and welfare of the cripple For long Scotland lagged behind other countries in orthopædic development, although proportionately her need was relatively high Certain voluntary organisations recognised the urgency of the need, and gradually Scotland came to realise its deficiencies In 1930 the first regional orthopædic scheme for cripple children was inaugurated for the south-east of Scotland at the Princess Margaret Rose Hospital at Fairmilehead, Edinburgh In 1937 the movement was further stimulated by the Nuffield gift for orthopædic work, of which £70 000 was allocated to Scotland Regional orthopædic councils had now been formed and the Scottish Orthopædic Council representing the regional associations, specialists and the Government departments, would fulfil an affiliating and unifying function Mr W R Fraser Secretary of the Department of Health for Scotland, said that the facilities in Scotland before the war were inadequate to deal with the problem They had now tried, through the emergency hospital service to establish specialised units of all types, including orthopædic units They now had seven units each staffed and equipped for specialised and surgical treatment It was possible that the organisation could be linked up with the orthopædic schemes of the local authorities and others concerned They had the makings of a first-rate service in Scotland, not only for immediate but also for postwar needs Sir John Fraser and his colleagues may be depended on to see that the work begun by Sir Henry Stiles in the last war shall this time be made to produce good dividends

PROGRESS OF DIPHTHERIA CAMPAIGN

Sir Alexander Russell of the Department of Health for Scotland lately reviewed the progress of the campaign for the immunisation of Scottish children against diphtheria The scheme continues and no time-limit is set Sir Alexander hopes it will later be merged in a permanent scheme Out of an estimated population of 1,155,000 preschool and school-children 733,978 (63 5% have already been immunised, the percentage being higher among the children at school than among the preschool children One local authority had competed with reluctant parents by issuing a diploma to all immunised children Those who did not receive the diploma were disappointed and many induced their parents to reverse their decision The scheme is voluntary and Sir Alexander hopes it will remain so Whenever compulsion is introduced there has to be a conscientious objectors' parties of miners from Wales and other parts of the country to Mr Nicoll's clinic were made at the meeting

* * *

During the woman-power debate Miss F Horsbrugh, for the Ministry of Health, made an interesting statement on the provision of nurseries for children of women working in factories More nurseries will continue to be built but many women prefer to leave their children with friends, and there is the question of infectious disease The war is providing a vast number of experiments but the Ministry, quite rightly, do not wish to plump for a uniform scheme where there are so many individual and local factors to be considered Many schemes for children are ready but in many places there are more schemes than there are children coming forward

FROM THE PRESS GALLERY

Food Policy and Nutrition

When Major G Lloyd George reviewed the food situation in the House of Commons on March 3 he was on the whole reassuring, but he warned members that we are facing a difficult period Our food imports would be reduced, and we should have to do without some of the things we were getting today Our reserves are good and a special effort is being made to safeguard the children's food About 650,000 children are obtaining meals at schools, and about 3,500,000 are receiving milk in school, as well as priority supplies of fresh milk at home Free supplies of black currant juice, orange juice and cod-liver oil are available for young children, who also enjoy priority for eggs and oranges Need rather than ability to pay is the mainspring of the Ministry's policy

About a third of family purchases of food are helped by Government subsidy The retail food index figure had fallen 7 points during the last year There are 1300 British restaurants serving over 350,000 meals a day

The total amount of liquid and condensed milk consumed from October, 1939, to February, 1940, was 436,000,000 gallons, and in the same period of this winter there had been made available in liquid, condensed and powdered milk 505,000,000 gallons Touching on the controversy in regard to the national wheatmeal loaf, Major Lloyd George said that if they increased the extraction rate of flour to 85% they would save shipping space and supply a bread which had certain nutritive advantages, but they would reduce the supply of animal feeding-stuffs, lose a certain amount of milk or eggs and have a type of bread which frankly was not in accordance with popular preference Only the Government were in a position to know at what moment the balance tipped down on the side of 85% extraction If and when a decision on this matter was taken, the change could be effected without delay

In the debate Sir Ernest Graham-Little strongly attacked the decision taken in July, 1940, to add a synthetic vitamin B_1 to white flour The responsibility for the decision was ascribed to the Bragg Scientific Food Committee, which Sir Ernest found astonishing as the committee had only been brought into existence four weeks earlier, and the Government had before it at that date the recommendations of an M R C committee of ten years' standing Further, Sir William Bragg himself three months later contributed to the *Times* an article emphasising the enormous importance of going back to a wholemeal diet for the great bulk of the people The Minister of Food had since stated that his decisions concerning bread had been guided by advice from the cereals division of the ministry and his scientific advisers Sir Ernest *said that from its composition the cereals* control board would necessarily be prejudiced in favour of milling interests The scientific advisers were Prof J C Drummond, D Sc , and Mr T Moran, D Sc In his book, published shortly before the decision, Professor Drummond compared the relative nutritional values of white and wholemeal bread He said that the content of iron was 9 for white and 21 for wholemeal bread There were 2200 international units of vitamin A in wholemeal bread and 250 in white bread, 1050 I U of vitamin B in wholemeal and 320 in white bread These three devastating comparisons, said Sir Ernest, were made by an expert held to be responsible for advising the ministry on the scheme to vitaminise bread Dr Moran, at the time when the scheme was introduced, was director of the *Flour Millers' Research Association* Sir Ernest claimed that the scientific opinion offered by the Medical Research Council was set aside in adopting this scheme The decision to vitaminise bread was not suddenly produced as a scientific proposition, but had been adopted by the Millers' Mutual Association as early as April 1939, not in the national interest but to help their own trade The white loaf was losing popularity at the time and it was felt that something must be done to restore its prestige No clinical examination was attempted before it was introduced The rise in the mortality and incidence of tuberculosis, the recent epidemic of gingivitis, and the high rate of dental caries in the Army all pointed to a deficiency in our diet Summing up his case, Sir Ernest contended that a combine of millers was exercising a strong control on the production of bread, and even on the Ministry of Food Sometime or other there would have to be an impartial inquiry as to why they obstructed what every expert advised, the prohibition of the white loaf and the provision of a proper wheatmeal loaf

Dr Haden Guest thought the scientific side of rationing was admirable, but he questioned whether the policy side was as realistic He suggested that it would be better to look at rationing from the physical survival standpoint rather than that of optimum nutrition The best way of dealing with milk would be to cheapen its cost The housewife wanted more butter, and more attention should be paid to her point of view We must not assume that because certain vitamins had been discovered we knew everything about butter, and that by adding vitamins to margarine it was made into butter He thought the ministry had been neglecting the possibilities of small producers of fruit and eggs Mr G Griffiths asked if diabetics could have a fair share of any oranges that were going, and if the price of insulin could be controlled A bottle which cost 2*s* 6*d* three months ago was 3*s* 4*d* today, and the wife of an insured man did not get a free supply Replying to the debate Major Lloyd George refused to add anything to what he had said about bread The ministry had no evidence at present that the diet of the people was having any detrimental effect on their health, but the Minister was keeping the closest watch by investigations in various parts of the country

QUESTION TIME

Health Insurance of Women War Workers

Miss E Rathbone asked the Minister of Health whether he was aware that some women war workers, and in particular married women, recently recruited into industry were being denied admission to approved societies , and what steps he had taken to see that these persons, who had responded to the call for national service, and were required to pay contributions under the National Health Insurance Acts were able to secure the normal benefits of those acts —Mr E Brown replied From inquiries which I have made it would appear that nearly 90% of women, including married women, who entered insurance in England in 1940 (the last year for which such information is available) secured admission to approved societies shortly after their entry into insurance, and that of the balance of about 10% many took no steps to join societies, although they were as deposit contributors individually advised by the central department of the advantages of society membership I have no reason for thinking that the position is any less favourable at the present time, but I have recently discussed with my consultative council the urgent necessity of admitting to society membership any war worker of either sex who seeks to secure the full cover of the National Health Insurance scheme through the normal approved society channels I am glad to be able to announce that the members of the council, which is representative of all types of approved societies, recognised the urgent importance of this question, and unanimously gave the fullest assurances that they would at once do everything possible to facilitate the admission of war workers to societies I for my part have assured the council that after the war, as part of a general review of the effect of the war on the finances of National Health Insurance, any adverse effect on societies resulting from the admission of these workers will be most sympathetically considered In the very few cases which may arise in which a war worker is in any difficulty in this matter my department will be ready to assist in securing berculosis research laboratories and finally, president nd director of the Desert Sanatorium in Tucson, rizona, where he remained until 1937. He made a big ontribution to scientific literature, largely on matters elating to tuberculosis On this subject his range was omprehensive, embracing the broad aspects of epidemioogy and public health allergy, immunity and anaphyaxis while he always remained alive to the clinical application of his experimental work particularly in regard to tuberculosis in children He was for many years editor of the *American Review of Tuberculosis* and in that journal Dr Max Pinner has said of him: ' there is hardly another man of his generation who has done so much to awaken interest in tuberculosis, both in the profession and in the lay public

N. L. R.

Surgeon Commander Ernest Robert Sorley, M D, R.N, is now presumed to have been lost when H.M S *Barham* was sunk He was educated at Aberdeen Grammar School and qualified at Aberdeen University in 1923 Two years later he joined the Navy and served in the Mediterranean the East Indies and Bermuda before he was sent to Singapore in 1936 where he became medical officer in charge From H.M S *Barham* he acted as squadron medical officer at the battle of Cape Matapan He leaves a widow formerly Miss Joan Dares, and two children

Medical News

University of Oxford

On Feb 28 the degree of D.M was conferred in absence on W. R Trotter

University of Cambridge

At a recent examination for the diploma in medical radiology and electrology, the following were successful —

Part I—G K F Cohen R. M Crichton Timothy Cullotr A. B. Donald, Maria E Grossman, H T Halper, H R. C Hay C J C G Hodson H R. Homes D A Jennings M B Leitch J M. Mennell D J Mitchell, R G Moffat J Y Rabinowitch Katharina Rosenkranz, A W Simmins J H Smitham, Lilian H Walter, R. A. Williams, and Hugh Wormald

University of Glasgow

The usual spring course of postgraduate lectures in ophthalmology has been arranged. On April 8 Prof W J B Riddell will speak on dark adaptation on April 15 Dr Herbert Brown on ophthalmic dermatology, on April 22 Dr James Hill on pathological problems, and on April 29, Dr Tom Howie on vestibular nystagmus

University of Dublin

The board of Trinity College has appointed Prof. J F Donegan M.B, of University College Galway, to deliver the John Mallet Purser lecture in 1942

Royal Society of Arts

On May 6, Lord Woolton will take the chair when Prof. J C Drummond, D Sc addresses this society on war-time diet On May 20, Prof. H D Kay, D Sc, is speaking on the future of the milk industry

On April 24 at the India and Burma section Sir Hassan Suhrawardy M D, will discuss the development of medical education in India All these meetings will take place at 1 45 P.M.

Royal College of Surgeons of England

On March 16, at 2 30 P.M Dr A J E Cave will give the first of six lecture demonstrations on topographical anatomy The lectures will take place at the college on Mondays, Wednesdays and Fridays for two successive weeks and are open to medical practitioners and advanced students

Nuffield Provincial Hospitals Trust

At a quarterly meeting of the regionalisation council of the trust held in Sheffield on Feb 12 it was announced that in the Berks Bucks and Oxon region a diabetic clinic had been established at the Radcliffe Infirmary, Oxford, to which the trust had made a grant for initial expenses The trust has also given £2500 to this region as a contribution towards their accident treatment centre A divisional hospital council has been set up for Tyneside Northumberland and North West Durham making the third formed in the north-east region The Cornwall divisional council has recommended that [illegible] grant should be used ' either to assist the cost of providing lectures for probationers in hospitals eligible for and recognised as preliminary training schools or, in coöperation with voluntary hospital and local authorities evolve a training scheme for all nursing services in the county '

Medical Honours

The military cross has been awarded to Captain B F. B Gulliver M.B Lond, R.A.M C, and Captain (temp Major) G T M Hayes, M.B N U.I., I.M S in recognition of gallant and distinguished services in the south-west Pacific

Medical Casualties

The following casualties have been announced :—

Died—Lieutenant Frederich Schulz M.D Prague R.A.M C

Missing, presumed killed—T 'Surgeon Lieutenant E A. Spouse, L.M.S S.A R.N V.R. H.M.S *Malabe'k*

Prisoner of War—W.S Captain J. H D Millar, M B Belf R A.M C

The Colonial Office also reports the following casualties among the civilian population of Malaya —

Prisoners.—Mr C P Allen F.R.C S.E (Sarawak) Dr L J Clapham M B Lond (Sarawak): Dr L W. Evans, M R.C.S (Penang) Dr G M Graham, L.M S Nova Scotia (Brunei); Dr. M P O Connor M D N U.I and his wife (Sarawak), Dr G A Ryrie, M.B Edin.

Faculty of Radiologists

At 1, Wimpole Street London W 1 on Friday March 20, at 2 P.M Prof Henry Cohen will deliver the Skinner lecture to the faculty He will speak on the nature, methods and purpose of diagnosis The meeting is open to all members of the medical profession On the following day, at 10 30 A.M, there will be a meeting of the therapy section at 32, Welbeck Street W 1, when Dr D W Smithers, Dr N S Finzi and Mr B W Windeyer will open a discussion on the control and treatment of radiation reactions

Offensive Waste

Under the Salvage of Waste Materials Order on Monday it became a punishable offence to burn, destroy throw away, or mix with refuse, paper or cardboard. In a statement on the order, Mr Ralph Assheton, parliamentary secretary to the Ministry of Supply, allowed only two exceptions to this wartime crime We may still use a modest amount of paper to light our fires and paper may still be destroyed to prevent the spread of an infectious disease Paper, Mr Assheton added is of paramount importance for our war effort and since the war started we have probably thrown away half a million tons that might have been used for munitions Paper can be used over and over again and its destruction must at all costs be avoided

Royal Society of Medicine

At a meeting of the section of pathology of this society to be held at 4 15 P.M, on Tuesday, March 17 a Ministry of Information film on blood transfusion will be shown Dr Paul Fildes F.R.S and Dr Alexander Haddow will also read papers The section of dermatology will meet at 2 P.M., on March 19, when Dr A C Roxburgh will speak on clinical photography On the same day at 4 30 P.M, there will be a discussion at the section of neurology on differential diagnosis and treatment of post-confusional states The openers are to be Group-Captain C P Symonds and Dr Aubrey Lewis On March 20, the section of obstetrics and gynæcology is holding a clinical meeting at 2 30 P.M at the British Postgraduate Medical School, Ducane Road W 12 At the same hour at the section of physical medicine Mr Ryder Jones and Miss E M Macdonald will open a discussion on occupational therapy, and at 3 30 P.M the section of radiology will discuss the place of radiotherapy in the treatment of thyrotoxicosis The opening speakers will be Mr R Vaughan Hudson Dr Laurence Martin, and Dr Frank Ellis

DDs in the NWF

Preparations in the National War Formulary which are dangerous drugs within the meaning of the act and regulations must conform to the Dangerous Drugs regulations and must state the quantity of the preparation to be dispensed A gummed amendment slip will shortly be sent to all doctors and chemists who are on the National Health Insurance panel

CORRIGENDA.—Reference 3 on p 295 of last issue should read Allen, A W and Welch C E *Ann Surg* 1941, 114 498

On page 265 the reference to trigonelline should be 5a

Tetrathionate broth In col 2 line 18 of p 133 (*Lancet* Jan 31) the amount of iodine solution should read 2 c cm (not 5 c cm) of a 50% solution clause and this he believes has already defeated the scheme for inoculation against smallpox 70% of the children of this country now being unvaccinated Last year 517 people in Scotland died from diphtheria 265 of them being between 1 and 5 years of age and 185 between 5 and 14 The record is nothing to be proud of seeing that diphtheria is an easily preventable disease Only when the percentage of immunised children has been raised to between 70 and 80 can the danger of an epidemic be discounted The defaulters are chiefly found among the poorer classes and the immunisation-rate is higher in rural than in urban areas despite the fact that the incidence of the disease is higher in the towns Of 55 areas in Scotland 17 have reached percentages of over 70 and some have even achieved 90% Glasgow and Aberdeen are among backward areas In considering whether the 1941 campaign had been a success or failure he reminded his hearers that most of the children had been inoculated in recent months and that immunity is not fully acquired for several months, thus it had been expected that the deaths in 1941 would be fairly high though they actually showed a reduction of 158 on the figure of 675 for 1940 There was a slight rise in the fourth quarter of 1941 but there are indications he said that the present quarter is not going to be quite so bad It has never been claimed that the scheme would be 100% effective, but figures not yet complete show that there have been 7821 cases among non-immunised children and only 934 among the immunised The disparity is even more striking in the case of the deaths, over 400 of which occurred among non-immunised children and only 10 among immunised There were no deaths among immunised children in 1941 in Dundee Lanarkshire Paisley. Aberdeenshire Ayrshire Stirlingshire and Edinburgh

TREATMENT OF MENTAL DISORDERS

In presenting the annual report of the Royal Edinburgh Hospital for Mental and Nervous Disorders Prof D K Henderson outlined a scheme to be developed when the war is over At Jordanburn Nerve Hospital which was established along with a group of nursing-homes during the last war there is accommodation for 50 in-patients and the admission-rate is well over 200 patients annually Outpatient treatment is provided daily for much larger numbers It is now planned that when times allow the beds should be doubled, a small department set aside for the study of children and adequate room provided for research and for such well-proved remedial aids as occupational therapy and recreational activities The idea is to have a well-appointed psychiatric clinic in the forefront a clinic to which everyone who needs it can come rich or poor and where every remedial aid can be given at a time when it is most likely to prove successful The hospital will thus set a standard for psychiatric work and act as a centre for constructive planning for mental health, it will serve as a school of research into mental illness and its prevention and cure; will receive all forms of nervous and mental illness for investigation and diagnosis but will treat only those not requiring certification, will cooperate with all agencies studying behaviour or conduct disorders, such as schools and law courts and will act as a training centre for students, and for postgraduates who wish to specialise in psychiatry. Physicians from mental hospitals may even come for refresher courses The hospital will of course be a training centre for nurses, social workers, and probation officers specially interested in psychiatric problems Such a development, he said, is long overdue in Great Britain In the United States and on the continent such clinics have existed for many years In London recently the York Clinic for psychological medicine has come into being, and Guy's thus has the distinction of being the first general hospital in the British Isles to have such a department Professor Henderson believes that every large medical school should have in association with it a well-organised psychiatric clinic working in close accord with the other branches of medicine Such interdependence would end the schism which has long divided physical and mental medicine

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export

Obituary

NORMAN ALTHAM

M B MANC ; CAPTAIN R A M C

Captain Altham died on Dec 22, after a short illness in the German prisoner-of-war camp Oflag VIIIB, where he was medical officer He was born in 1914 the elder son of Mr J G Altham of Staden Manor, Buxton, and educated at the North Manchester School, Manchester Grammar School and the University of Manchester, where he graduated M.B in 1938 After a brief house-appointment at Lancaster Royal Infirmary he returned to Manchester and became one of Prof Harry Platt's house-surgeons at the Royal Infirmary In April, 1939 Altham was commissioned in the RAMC and on the declaration of war he was one of the first contingent to cross to France with the BEF He was attached to the Gordon Highlanders and he remained in France till he was captured in June 1940

HAROLD SIDNEY MELLOWS

M B CAMB , FLIGHT-LIEUTENANT R A.F V.R

Dr Harold Mellows, who died as the result of a flying accident last November, was the son of the late Mr W M. Mellows and Mrs Mellows of Wallington He was educated at Eastbourne College and Queens College, Cambridge, and later went to King's College Hospital He was a keen sportsman and played rugger for his school, college and hospital He qualified in 1935 and took his Cambridge degree two years later After holding a house-appointment at King's he went into partnership at West Wickham Kent with Dr. George Cook who writes "Both at hospital and, later, in partnership Mellows was a delightful colleague The welfare of his patients was always his chief concern and he gave generously of his services His consideration for those with whom he worked was unfailing and his good nature and sincerity won him many friends

[illegible]

Mellows volunteered for service with the RAF and was called up in October 1940, and served as medical officer to a bomber squadron in Norfolk He married in 1936 Miss Linda Scorer of Lincoln whom he left with a son and daughter. The birth of a second daughter is now announced

MALCOLM STEWART

M B GLASG

Dr Sage Sutherland formerly medical superintendent of Monsall Hospital Manchester writes Dr Malcolm Stewart, of Hollinwood, Lancashire, who died on Jan 17, at a comparatively early age was specially interested in philosophy and classics He graduated in arts at Glasgow University in 1916, and became a school teacher in his native Island of Skye where he joined the late Mrs Kennedy Fraser in collecting many of the songs of the Hebrides His knowledge of Gaelic and his vivid imagination made his sympathetic renderings of these melodies memorable Later he returned to Glasgow to study medicine and graduated M B in 1925 He was a sympathetic and attentive medical practitioner, and his native genius and mental attainments would have carried him far, but physical handicap compelled him to spend his life in an industrial practice, where his memory will not soon be forgotten

DR ALLEN KRAUSE

THE death of Allen K Krause in May 1941, after several years of illness is a sad loss to tuberculosis in the U S A and, indeed throughout the world—but in our preoccupation with other things it has had scant notice Shortly after qualification Krause was appointed instructor in pathology at Johns Hopkins University and, later, assistant director of the Saranac laboratory Subsequently he became director of the Kenneth Dows berculosis research laboratories and, finally, president ad director of the Desert Sanatorium in Tucson, rizona, where he remained until 1937 He made a big ontribution to scientific literature, largely on matters elating to tuberculosis On this subject his range was omprehensive, embracing the broad aspects of epidemio- gy and public health, allergy immunity and anaphy- axis while he always remained alive to the clinical pplication of his experimental work, particularly in egard to tuberculosis in children He was for many ears editor of the *American Review of Tuberculosis* and n that journal Dr Max Pinner has said of him " there s hardly another man of his generation who has done so nuch to awaken interest in tuberculosis, both in the rofession and in the lay public " N L R

Surgeon Commander ERNEST ROBERT SORLEY, M D, R N, is now presumed to have been lost when H M S *Barham* was sunk He was educated at Aberdeen Grammar School and qualified at Aberdeen University in 1923 Two years later he joined the Navy and served in the Mediterranean, the East Indies and Bermuda before he was sent to Singapore in 1936 where he became medical officer in charge From H M S *Barham* he acted as squadron medical officer at the battle of Cape Matapan He leaves a widow, formerly Miss Joan Dares, and two children

Medical News

University of Oxford

On Feb 28 the degree of D M was conferred in absence on W R Trotter

University of Cambridge

At a recent examination for the diploma in medical radiology and electrology, the following were successful —

Part I —G K F Cohen, R M Crichton Timothy Culloty A. B. Donald, Maria E Grossman, H T Halper, H R C Hay C J C G Hodson H R Homes D A Jennings, M B Leitch, J M Mennell, D J Mitchell, R G Moffat J Y Rabinowitch, Katharina Rosenkranz, A W Simmins, J H Smitham, Lilian H Walter R A Williams, and Hugh Wormald

University of Glasgow

The usual spring course of postgraduate lectures in ophthalmology has been arranged On April 8, Prof W J B Riddell will speak on dark adaptation, on April 15, Dr Herbert Brown on ophthalmic dermatology, on April 22, Dr James Hill on pathological problems, and on April 29, Dr Tom Howie on vestibular nystagmus

University of Dublin

The board of Trinity College has appointed Prof J. F Donegan, M B, of University College, Galway, to deliver the John Mallet Purser lecture in 1942

Royal Society of Arts

On May 6, Lord Woolton will take the chair when Prof J C Drummond, D Sc, addresses this society on war time diet On May 20, Prof H. D Kay, D Sc, is speaking on the future of the milk industry

On April 24 at the India and Burma section, Sir Hassan Suhrawardy, M D, will discuss the development of medical education in India All these meetings will take place at 1 45 P M

Royal College of Surgeons of England

On March 16, at 2 30 P M, Dr A J E Cave will give the first of six lecture demonstrations on topographical anatomy The lectures will take place at the college on Mondays, Wednesdays and Fridays for two successive weeks, and are open to medical practitioners and advanced students

Nuffield Provincial Hospitals Trust

At a quarterly meeting of the regionalisation council of the trust held in Sheffield on Feb 12 it was announced that in the Berks, Bucks and Oxon region a diabetic clinic had been established at the Radcliffe Infirmary, Oxford, to which the trust had made a grant for initial expenses The trust has also given £2500 to this region as a contribution towards their accident treatment centres A divisional hospital council has been set up for Tyneside, Northumberland and North West Durham making the third formed in the north east region The Cornwall divisional council has recommended that the trust's grant should be used " either to assist the cost of providing lectures for probationers in hospitals eligible for and recognised as preliminary training schools, or, in coöperation with voluntary hospital and local authorities, evolve a training scheme for all nursing services in the county "

Medical Honours

The military cross has been awarded to Captain B F B Gulliver, M B Lond, R A M C, and Captain (temp Major) G T M Hayes, M B N U I, I M S, in recognition of gallant and distinguished services in the south west Pacific

Medical Casualties

The following casualties have been announced —

Died —Lieutenant Frederich Schulz, M D Prague R A M C

Missing, presumed killed —T /Surgeon Lieutenant E A Spouse, L M S S A, R N V R, H.M.S *Matabele*

Prisoner of War —W S /Captain J. H D Millar, M B Belf, R A M C

The Colonial Office also reports the following casualties among the civilian population of Malaya —

Prisoners —Mr C P Allen F R C S E (Sarawak), Dr L J Clapham, M B Lond (Sarawak) Dr L W Evans, M R C S (Penang) Dr G M Graham, L M S Nova Scotia (Brunei), Dr M P O'Connor M D N U I and his wife (Sarawak), Dr G A Ryrie, M B Edin

Faculty of Radiologists

At 1, Wimpole Street, London, W 1, on Friday, March 20, at 2 P M, Prof Henry Cohen will deliver the Skinner lecture to the faculty He will speak on the nature, methods and purpose of diagnosis The meeting is open to all members of the medical profession On the following day, at 10 30 A M, there will be a meeting of the therapy section at 32, Welbeck Street, W 1, when Dr D W Smithers, Dr N S Finzi and Mr B W Windeyer will open a discussion on the control and treatment of radiation reactions

Offensive Waste

Under the Salvage of Waste Materials Order on Monday it became a punishable offence to burn, destroy, throw away, or mix with refuse, paper or cardboard In a statement on the order, Mr Ralph Assheton, parliamentary secretary to the Ministry of Supply, allowed only two exceptions to this wartime crime We may still use a modest amount of paper to light our fires and paper may still be destroyed to prevent the spread of an infectious disease Paper, Mr Assheton added is of paramount importance for our war effort and since the war started we have probably thrown away half a million tons that might have been used for munitions Paper can be used over and over again and its destruction must at all costs be avoided

Royal Society of Medicine

At a meeting of the section of pathology of this society to be held at 4 15 P M, on Tuesday, March 17, a Ministry of Information film on blood transfusion will be shown Dr Paul Fildes, F R S and Dr Alexander Haddow will also read papers The section of dermatology will meet at 2 P M, on March 19, when Dr A C Roxburgh will speak on clinical photography On the same day, at 4 30 P M, there will be a discussion at the section of neurology on differential diagnosis and treatment of post confusional states The openers are to be Group Captain C P Symonds and Dr Aubrey Lewis On March 20, the section of obstetrics and gynæcology is holding a clinical meeting, at 2 30 P M, at the British Postgraduate Medical School, Ducane Road, W 12 At the same hour at the section of physical medicine Mr Ryder Jones and Miss E M Macdonald will open a discussion on occupational therapy, and at 3 30 P M the section of radiology will discuss the place of radiotherapy in the treatment of thyrotoxicosis The opening speakers will be Mr R Vaughan Hudson, Dr Laurence Martin, and Dr Frank Ellis

DDs in the NWF

Preparations in the National War Formulary which are dangerous drugs within the meaning of the act and regulations must conform to the Dangerous Drugs regulations and must state the quantity of the preparation to be dispensed A gummed amendment slip will shortly be sent to all doctors and chemists who are on the National Health Insurance panel

CORRIGENDA —Reference 3 on p 295 of last issue should read Allen, A W and Welch, C E *Ann Surg* 1941, 114, 498

On page 265 the reference to trigonelline should be 5a

Tetrathionate broth In col 2, line 18 of p 133 (*Lancet*, Jan 31) the amount of iodine solution should read 2 c cm (not 5 c cm) of a 30% solution

Notes, Comments and Abstracts

HEALTH VISITORS SUPPLY AND DEMAND

SOME north country local authorities, claiming that they were unable to get qualified health visitors, have been appointing unqualified people to fill vacancies The Joint Consultative Committee of institutions recognised by the Ministry of Health for the training of health visitors, and of organisations of health visitors, decided to find out whether or not there was a general shortage of qualified women, and if so what steps were being taken to meet it They learned from the Royal Sanitary Institute that the number of successful candidates for the health visitor's certificate in the last four years were 315 in 1938, 262 in 1939, 266 in 1940, and 245 in 1941 The drop of 53 in 1939 could be largely explained by the fact that the December examination in that year was cancelled If 1939 is regarded as a prewar year (in the sense that all the candidates qualifying that year took their examination before war broke out) then the two war years show 511 qualifications as against 577 in the two prewar years—a falling off of 66 On the other hand taking the four years together, 1088 health visitors have qualified since 1938, as against 940 in the previous four years (1934–37)—a gain of 148 The supply on the whole thus shows no gross falling off

Training has not been interrupted All the training institutions which were giving courses in the early months of 1939 are still doing so, and 252 students began their courses at or after Easter 1941 These were selected from 567 applications, and though some people may have applied to more than one school (so that the figure of 567 is probably unduly high) it is quite clear that the supply of student health visitors could be increased if facilities for training them were available If the expected percentage of candidates is successful there will be 195 newly qualified health visitors in the early months of 1942, and these will be augmented by those who qualify later in the year (probably 34 in Manchester alone)

In order to estimate the demand the committee sent a short questionnaire to the medical officers of health of every county, county borough, metropolitan and non-county borough, and of each urban district and rural district employing health visitors—a total of 589 authorities in all It appears from the 439 replies received that 74 authorities do not appoint health visitors Of the remaining 365 authorities replying, only 36 had vacancies of long standing, and 8 of these finally filled them, 6 authorities no longer wished to make appointments because the population of the district had fallen owing to evacuation There were therefore 22 authorities with long-standing vacancies for 49 health visitors The number of temporary vacancies—due to absence of permanent staff on war work—was very small An analysis of the conditions of service offered by the 22 authorities showed that 11 were offering salaries in which the maximum was less than £250 a year and one a minimum of less than £200 Even in 1937 local authorities offering salaries as low as this were having trouble in getting health visitors, so that the war cannot be blamed for their shortage of applicants except in so far as the increased cost of living makes the terms still less attractive The county council appointments often require the health visitor to work in lonely and isolated districts, and moreover all save one of the county authorities experiencing shortage require the health visitor to provide her own car for the work

Four authorities have attempted to meet the difficulty by appointing unqualified women temporarily or otherwise to do the work of health visitors, but the committee feel that since the numbers qualifying have been well maintained this sort of dilution is not justified, and that there are no grounds for suspending the legal requirement that a person appointed to undertake health visiting should produce her evidence of training It is usual for a health visitor to hold her certificate of training as state registered nurse as well as the health visitor's certificate, and many hold a certificate of midwifery training in addition Her professional education may thus have lasted as much as six years—as long in fact as medical training—and her rewards should be commensurate with her qualifications

SCABIES AND NATIONAL WAR FORMULARY

IN view of the increased incidence of scabies the Ministry of Health have decided to amend the National War Formulary by including a preparation for the treatment of scabies Of several formulæ which have been tried, both pharmaceutically and clinically, the following has been found to be the most satisfactory and will be issued as a slip which can be gummed into the formulary

Benzyl Benzoate Application

Benzyl benzoate	25 g
Lanette Wax SX (of commerce)	2 g
Water	to 100 ml

Chemists will be able to obtain supplies of 'Lanette Wax SX' from Messrs Ronsheim and Moore, 4 Anne Boleyn's Walk, Cheam, Surrey

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED FEB 28

Notifications —The following cases of infectious disease were notified during the week, smallpox, 0, scarlet fever, 1124, whooping-cough, 1315, diphtheria, 859, paratyphoid, 2, typhoid, 6, measles (excluding rubella), 2335, pneumonia (primary or influenzal) 1145, puerperal pyrexia, 175, cerebrospinal fever, 164, poliomyelitis, 8, polio-encephalitis, 1, encephalitis lethargica, 4, dysentery, 131, ophthalmia neonatorum, 72 No case of cholera, plague or typhus fever was notified during the week

The number of civilian and service sick in the Infectious Hospitals of the London County Council on Feb 18 was 1382, including scarlet fever, 112, diphtheria, 223, measles, 61, whooping-cough 5?0, zymotic enteritis, 66, chicken pox, 53, erysipelas, 29, mumps 4?, poliomyelitis, 1, dysentery 39, cerebrospinal fever, 22, puerperal sepsis, 26, enteric fevers, 8, other diseases (non infectious) 101, not yet diagnosed, 76

Deaths —In 126 great towns there were no deaths from enteric fevers or scarlet fever, 7 (1) from measles, 12 (3) from whooping-cough, 22 (1) from diphtheria, 28 (1) from diarrhœa and enteritis under 2 years, and 74 (9) from influenza The figures in parentheses are those for London itself

Bradford and Birmingham each reported 5 death from influenza no other great town more than 4 There were 5 fatal cases of diphtheria at Liverpool

The number of stillbirths notified during the week was 232 (corresponding to a rate of 40 per thousand total births), including 27 in London

Births, Marriages and Deaths

BIRTHS

BONNIN —On March 3, at Brockett Hall, Welwyn, the wife of Mr J Grant Bonnin F R C S —a son

DACIE —On March 5 at Sutton the wife of Dr J V Dacie—a son

DALLEY —On March 6, at Fulmer Chase, Bucks, the wife of Captain Gilbert Dalley R A M C —a son

EDWARDS —On Feb 26, at Esher, the wife of Captain F Hatch Edwards, R A M C —a daughter

HOULIHAN —On March 7, at Windsor, the wife of Squadron Leader J F Houlihan M B —a son

MELLOWS —On March 4 at Lincoln, the wife of the late Flight Lieutenant H S Mellows, M B, R A F —a daughter

PRYTHERCH —On Feb 28, at Bangor, the wife of Dr R Pe Prytherch, of Criccieth—a daughter

MARRIAGES

DALY—KELLY —On Feb 26, in the Middle East, Anthony James Daly M B captain R A M C to Yvette Adrienne Kelly Q A I M N S R

DEATHS

BOYAN —On March 2 at Yelverton, John Boyan M R C S, surgeon Captain, R N, rtd

BRACKENBURY —On March 8, at Mudford, Yeovil Somerset S, Henry Britten Brackenbury M R C S, HON M D N U I, LLD WALES, aged 75

MACILWAINE —On March 3, in London Alexander Gillilan Johnson MacIlwaine, C I E, L R C P I, lieut colonel R A M

SOUTHALL —On Feb 28 at Edgbaston, Birmingham, Stephen Southall, M D EDIN aged 64 years

USHER —On March 3, in Edinburgh, Charles Howard Usher, M B EDIN F R C S E

The Index and title-page to Vol II, 1941, which was completed with the issue of Dec 27, will be ready next week A copy will be sent gratis to subscribers on receipt of a post card addressed to the Manager of THE LANCET, 7, Adam Street, Adelphi, W C 2 Subscribers who have not already indicated their desire to receive indexes regularly as published should do so now

RECONSTRUCTION IN THE PRACTICE OF MEDICINE *

SIR E FARQUHAR BUZZARD, BT,
K C V O, M.D OXFD, F R C P
REGIUS PROFESSOR OF MEDICINE IN THE UNIVERSITY OF OXFORD,
CONSULTING PHYSICIAN TO ST THOMAS'S HOSPITAL

THE privilege of delivering this oration within the walls of the college has been denied to me, as to my immediate predecessor in this office, owing to destructive forces from which our home, like many others, has not entirely escaped It is not unnatural that pending its organic restoration, our thoughts should be busy with replanning the functional activities of our profession in the world outside At a moment when it seems we are faced with the imposition or the adoption of a new order in the practice of medicine it may not be unprofitable to ask of ourselves whether and why we admit a need for changes

To the first question there is but one answer Those of us who have been studying and practising medicine for half a century are probably as ready to admit or even to assert this need as the student or lately qualified practitioner of today In fact, there is general agreement that the profession, as at present organised, is not giving the public the best service of which it is capable—allowing that there may be some differences of opinion in regard to the origin and nature of its shortcomings If, then, we admit that the practice of medicine is ailing we, as physicians, should study its past history, the changes which have taken place in its environment, and the symptoms from which it is now suffering, before venturing to prescribe any form of treatment As physicians too we shall be prepared and not surprised to see our prescription disregarded and our prognosis falsified !

There are a number of considerations which must influence our judgment of the past and our advice for the future We must remember, for instance, that although the practice of medicine, in some form or other, is of great antiquity, the present variety, characterised by its struggle for scientific status, is but a child and still in need of guidance and education Its attributes, inherent or acquired good bad or indifferent, are plain to see and it should not be beyond our powers so to fashion its adolescence that in its maturity it may satisfy the just needs of the community Nor must we forget that the practice of medicine is only one of many social services the evolution of which is being materially affected by rapid changes in the classic and economic fabric of our time and country Medical isolationism is neither possible nor desirable

In the course of any evolutionary process, notably in the cultivation of the tree of knowledge, branches are apt to pass through phases of rich growth and expansion with the result that we are in danger of regarding them as distinct plants and to forget the ultimate purposes which they share with kindred offshoots While we are reconciled to these natural phenomena and are satisfied that real progress is largely dependent on them it is incumbent on us to watch their steps and, at the appropriate moment, to guide them towards their common goal

In the last hundred years, particularly in the last seventy, we have seen examples of remarkable growth in each of the two main branches of the practice of medicine, the remedial and the preventive, each has become increasingly specialised and distinct from the other, each requires separate review before determining what is to be their future relationship and whether the time is ripe for [illegible] control the doctor's use of his innate senses sight, hearing and touch, in the diagnosis of disease and in his powers of observation and deduction, both at the bedside and in the post-mortem room Careful observations and accurate records attained high standards while the influence exercised by the natural sciences was still in its early stages Except for the exploitation of antisepsis and asepsis in the field of surgery treatment made no great advances At the same time much knowledge was accumulated in regard to the origin, natural history and classification of pathological processes

Then followed an era when the ancillary sciences, especially those of physics and chemistry, conspired to supply the doctor with many important additions to his equipment for both diagnosis and treatment The discovery of X rays and radium, the large increase of work undertaken by clinical, bacteriological and biochemical laboratories and the recent rapid advances in physio- and chemo-therapy are only a few examples of the scientific mechanization of medical practice in later days

In a few words the ancillary sciences have in the course of forty or fifty years, changed the whole aspect of medical practice and, what is still more important to realise, have poured into the minds and hands of the profession a mass of new knowledge and new equipment which they were ill prepared and ill organised to use for the universal benefit of the public Even if we claim, as undoubtedly we can, that very creditable efforts have been made to meet this situation we must admit an urgent need for the reorganisation of our ranks and our resources Perhaps I should have said organisation rather than reorganisation because evidence of the former has been little enough during this period of rapid progress, when rivalry and competition, personal and institutional, have had almost unlimited free play Such a period was probably necessary and even desirable for a successful campaign against disease, but should it not be followed by some consolidation of our gains and some redistribution of our forces before venturing on further conquests ?

INTRINSIC DIFFICULTIES

What are the chief difficulties in the path of satisfactory medical practice today ? I should have little hesitation in placing first among these the factor of 'time" May I quote a few passages of my own, written five years ago ?

"It is probably true to say that the time factor is not yet popularly recognized as the most important ingredient of efficient medical practice, and that every addition to the store of medical knowledge enhances its value The more possibilities open to the mind of the doctor, the more paths of enquiry he is obliged to pursue, the more evidence there is collected to be weighed, the longer is the time he needs to do justice to his patient The not uncommon belief that the speed with which a doctor arrives at a diagnosis is an indication of his professional ability rather than of his business capacity, cannot be seriously supported, and even if it may be to some extent justified when a case of fully developed disease is placed before him it lacks all foundation when he is confronted with what are known as minor ailments If the standard of health of the community is to be raised it can only be by the earliest possible detection of slight departures from normal health and by the prompt initiation of measures for their arrest It is at this stage that recognition of illness is most urgent and fruitful, and it is then, far more than later, that the doctor requires time to bring all his knowledge and all his technical resources into action Both oral and physical examinations of the patient involve expenditure of time, and in most cases the former is the more lengthy as well as the more enlightening piece of research if skilfully pursued

Notes, Comments and Abstracts

HEALTH VISITORS SUPPLY AND DEMAND

SOME north country local authorities, claiming that they were unable to get qualified health visitors, have been appointing unqualified people to fill vacancies The Joint Consultative Committee of institutions recognised by the Ministry of Health for the training of health visitors, and of organisations of health visitors, decided to find out whether or not there was a general shortage of qualified women, and if so what steps were being taken to meet it They learned from the Royal Sanitary Institute that the number of successful candidates for the health visitor's certificate in the last four years were 315 in 1938, 262 in 1939, 266 in 1940, and 245 in 1941 The drop of 53 in 1939 could be largely explained by the fact that the December examination in that year was cancelled If 1939 is regarded as a prewar year (in the sense that all the candidates qualifying that year took their examination before war broke out) then the two war years show 511 qualifications as against 577 in the two prewar years—a falling off of 66 On the other hand taking the four years together, 1088 health visitors have qualified since 1938, as against 940 in the previous four years (1934–37)—a gain of 148 The supply on the whole thus shows no gross falling off

Training has not been interrupted All the training institutions which were giving courses in the early months of 1939 are still doing so, and 252 students began their courses at or after Easter 1941 These were selected from 567 applications, and though some people may have applied to more than one school (so that the figure of 567 is probably unduly high) it is quite clear that the supply of student health visitors could be increased if facilities for training them were available If the expected percentage of candidates is successful there will be 195 newly qualified health visitors in the early months of 1942, and these will be augmented by those who qualify later in the year (probably 34 in Manchester alone)

In order to estimate the demand the committee sent a short questionnaire to the medical officers of health of every county, county borough, metropolitan and non-county borough, and of each urban district and rural district employing health visitors—a total of 589 authorities in all It appears from the 439 replies received that 74 authorities do not appoint health visitors Of the remaining 365 authorities replying, only 36 had vacancies of long standing, and 8 of these finally filled them, 6 authorities no longer wished to make appointments because the population of the district had fallen owing to evacuation There were therefore 22 authorities with long-standing vacancies for 49 health visitors The number of temporary vacancies—due to absence of permanent staff on war work—was very small An analysis of the conditions of service offered by the 22 authorities showed that 11 were offering salaries in which the maximum was less than £250 a year and one a minimum of less than £200 Even in 1937 local authorities offering salaries as low as this were having trouble in getting health visitors, so that the war cannot be blamed for their shortage of applicants except in so far as the increased cost of living makes the terms still less attractive The county council appointments often require the health visitor to work in lonely and isolated districts, and moreover all save one of the county authorities experiencing shortage require the health visitor to provide her own car for the work

Four authorities have attempted to meet the difficulty by appointing unqualified women temporarily or otherwise to do the work of health visitors, but the committee feel that since the numbers qualifying have been well maintained this sort of dilution is not justified, and that there are no grounds for suspending the legal requirement that a person appointed to undertake health visiting should produce her evidence of training It is usual for a health visitor to hold her certificate of training as state registered nurse, as well as the health visitor's certificate, and many hold a certificate of midwifery training in addition Her professional education may thus have lasted as much as six years—as long in fact as medical training—and her rewards should be commensurate with her qualifications

SCABIES AND NATIONAL WAR FORMULARY

IN view of the increased incidence of scabies the Ministry of Health have decided to amend the National War Formulary by including a preparation for the treatment of scabies Of several formulæ which have been tried, both pharmaceutically and clinically, the following has been found to be the most satisfactory and will be issued as a slip which can be gummed into the formulary

Benzyl Benzoate Application

Benzyl benzoate	25 g
Lanette Wax SX (of commerce)	2 g
Water	to 100 ml

Chemists will be able to obtain supplies of 'Lanette Wax SX' from Messrs Ronsheim and Moore, 4, Anne Boleyn Walk, Cheam, Surrey

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED FEB 28

Notifications —The following cases of infectious disease were notified during the week, smallpox, 0, scarlet fever, 1124, whooping-cough, 1315, diphtheria, 859, paratyphoid, 2, typhoid, 6, measles (excluding rubella), 2335, pneumonia (primary or influenzal), 1145, puerperal pyrexia, 175, cerebrospinal fever, 104, poliomyelitis 8, polio-encephalitis, 1, encephalitis lethargica, 4, dysentery, 131, ophthalmia neonatorum, 72 No case of cholera, plague or typhus fever was notified during the week

The number of civilian and service sick in the Infectious Hospital of the London County Council on Feb 18 was 1382, including scarlet fever, 112, diphtheria, 223, measles, 61, whooping-cough, [illegible] zymotic enteritis, 66, chicken pox, 53, erysipelas, 29 mumps [illegible], poliomyelitis, 1, dysentery, 39, cerebrospinal fever, 22, puerperal sepsis, 26, enteric fevers, 8, other diseases (non infectious) 101, not yet diagnosed, 76

Deaths —In 126 great towns there were no deaths from enteric fevers or scarlet fever, 7 (1) from measles, 12 (3) from whooping-cough, 22 (1) from diphtheria, 28 (1) from diarrhœa and enteritis under 2 years, and 74 (0) from influenza The figures in parentheses are those for London itself

Bradford and Birmingham each reported 5 deaths from influenza no other great town more than 4 There were 3 fatal cases of diphtheria at Liverpool

The number of stillbirths notified during the week was 232 (corresponding to a rate of 40 per thousand total births), including 27 in London

Births, Marriages and Deaths

BIRTHS

BONNIN —On March 3, at Brockett Hall, Welwyn the wife of Mr J Grant Bonnin, F R C S —a son

DACIE —On March 5, at Sutton the wife of Dr J V Dacie—a son

DALLEY —On March 6, at Fulmer Chase, Bucks, the wife of Captain Gilbert Dalley, R A M C —a son

EDWARDS —On Feb 26, at Esher, the wife of Captain I Harold Edwards, R A M C —a daughter

HOULIHAN —On March 7, at Windsor, the wife of Squadron Leader J F Houlihan, M B —a son

MELLOWS —On March 4, at Lincoln the wife of the late Flight Lieutenant H S Mellows, M B, R A F —a daughter

PRYTHERCH —On Feb 28, at Bangor, the wife of Dr R Pa Prytherch, of Criccieth—a daughter

MARRIAGES

DALY—KELLY —On Feb 26, in the Middle East, Anthony James Daly, M B, captain R A M C, to Yvette Adrienne Kelly, Q A I M N S R

DEATHS

BOYAN —On March 2 at Yelverton, John Boyan, M R C S, surgeon Captain, R N retd

BRACKENBURY —On March 8, at Mudford, Yeovil Somerset Sir Henry Britton Brackenbury, M R C S, HON M D N U I, LL D WALES, aged 75

MACILWAINE —On March 3, in London Alexander Gillilan Johnson MacIlwaine, C I E, F R C P I, lieut colonel R A M C

SOUTHALL —On Feb 28, at Edgbaston, Birmingham Stephen Southall, M D EDIN, aged 64 years

USHER —On March 3, in Edinburgh, Charles Howard Usher, M B EDIN, F R C S E

The Index and title-page to Vol II, 1941, which was completed with the issue of Dec 27, will be ready next week A copy will be sent gratis to subscribers on receipt of a post card addressed to the Manager of THE LANCET, 7, Adam Street Adelphi, W C 2 Subscribers who have not already indicated their desire to receive indexes regularly as published should do so now it is true that great strides have been and are being made in the fight against a number of serious ailments as the result of work in laboratories of pathology biochemistry pharmacology bacteriology and physiology, the time has come for an organised investigation of the social factors in many obscure ætiological problems by a force of doctors specially trained for the purpose

The results obtained in the field of industrial diseases suggest a wider scope for similar inquiries into the origin of many other disabilities Is it not possible for instance that the key to the ætiology of such common diseases as the various forms of rheumatism and the septic ulcer may be found in the social field ? It is a welcome sign of progress that field work in relation to the nutrition of the population has been stimulated by the present national emergency and in so doing affords a good example of how the laboratory worker and the clinician can combine to attack an obscure problem from at least two angles Let us hope that such examples may be more generally followed and that the divorce between the research laboratory and the ward arising more from diversity of environment and atmosphere than from any one-sided monopoly of talent may be completely rescinded

AND THEIR ERADICATION

If the basic defects in our professional organisation have been sketchily but truthfully indicated we may consider the principles which should govern the process of their eradication It would seem that there are three main branches of professional activity each of which however well defined should work in close accord with the others

The first branch is that of environmental hygiene and preventive medicine, the field allotted by necessity to medical officers of health who have legal authority for many of the measures they take in order to accomplish their task These officers require and do in fact receive, special postgraduate training for their preventive work

The second branch is that of personal hygiene including preservation of health, the early detection and diagnosis of ill health and the care of patients suffering from the lesser and more chronic disabilities These are the special and important prerogatives of the general practitioner For this career there is no adequate training provided and little organised collaboration with the public health branch

The third branch includes curative medicine, teaching and research, which come within the range of the specialised and academic departments of institutions The preparation for careers in these subjects is fairly adequate, but liaison with the general practitioner branch is still imperfectly defined and organised

To these three branches of professional activity I would hope to see added in the near future one of social medicine It would need to be developed on experimental lines, perhaps by the establishment of two or three departments for the purpose in universities with medical schools In time these would I am confident, contribute much to the efficiency of the other three branches At the moment there would seem to be few members of the profession specially trained for the promotion of social medicine and no schools available to meet the demand I do not hesitate to submit that steps to overcome this gap in our resources are among the most urgent needs of the immediate future, in the interests of the public and of the profession

Reconstruction

We may now turn to the subject of reconstruction, fully recognising that this process must be carried out gradually, that the structure we are designing must be raised on well chosen and well-considered foundations and that in its erection old material which has proved its worth may well be utilised

Starting with the assumption that some measure of postgraduate training is desirable for every duly qualified practitioner whether he enters the field of general practice, of public health of consulting practice of social medicine or of teaching and research it is obviously desirable to decide what kind of education should be common to all students seeking to enter the medical profession Considering the dissatisfaction almost universally expressed with the general education of the medical student, it is surprising to find that there is still no effective collaboration between secondary schools and universities in this country, no authoritative body endowed with the responsibility of planning an agreed scheme of preparation for the learned professions

Were an authoritative body in existence it would. I venture to think make some such recommendations as the following for prospective medical students —

(1) That education at school until 18 years of age should be of a general character including a measure of instruction in biology chemistry and physics such as every boy and girl has a right to demand, whatever is to be his or her career in life This would allow time to acquire some degree of proficiency in the English and at least one or two other, modern languages and would do away with the curse of early specialisation

(2) That entry to university medical schools by scholarships or otherwise should be gained by general merit and intelligence, judged by examinations and by school reports on the candidates' fitness for a medical career Such a step would again discourage early specialisation and would give the medical student a wider cultural background than is possible in most instances today

Medical education would then begin in the medical school which would have as its primary object the training of students for a basic qualification to enter the profession on the understanding that further preparation would be necessary for each of its main branches of practice This medical curriculum naturally divides itself although the division should not be too rigid, into preclinical and clinical phases and the former is ripe for critical reconsideration

PRECLINICAL EDUCATION

Leaving aside any period devoted voluntarily to the advanced study of some scientific subject such as physiology anatomy biochemistry. embryology or pharmacology, the preclinical stage should occupy 3 years During that time the student should acquire a general knowledge of human biology and for that purpose it should be possible to devise an integrated course of instruction unspoilt and uncomplicated by traditional conventions Such a syllabus could and should avoid many anomalies which only serve to confuse the student's mind and to damp his natural interest in his work Why he may ask - should I study the gross anatomy of an organ, its minute structure and functions, in different departments and at different times ? The aim of the syllabus should be to gain for the student an understanding of man as a living animal of the principles governing his heredity and reproduction of his growth, nutrition and development and of the forces underlying his mental and physical activities and his reactions to his environment

In supplying the student with this knowledge it is necessary to utilise animals lower than man and thus "to exhort him to search and study out the secrets of nature by way of experiment At the same time there is much in human biology which can be best illustrated by observations on living man, both healthy and unhealthy and much more use should be made of patients during this stage of the curriculum It may well be that the importance of exercising the faculty of discrimination in medical education is inadequately recognised and that the student's memory, critical judgment and interest would be reinforced by affording him every opportunity of comparing the normal with the abnormal in human structure and function In addition to the intrinsic value of such exercises they serve to break down the artificial barriers dividing the curriculum into a number of watertight compartments and to give the student a sense of reasonable and reasoned continuity in his education which is now lacking

This is not the moment for attempting a detailed reconstruction of the preclinical syllabus but it would not be out of place to suggest that time could be spared from the hours spent in dissecting the whole body, for instance, and devoted to the study of elementary sociology and psychology It is impossible to appreciate the problems of human life without some acquaintance with man's normal and abnormal reactions to his physical and personal environment, and the earlier the student is introduced to this important aspect of his future work the better prepared will he be to understand the significance of health and disease when he enters his hospital world

"That, in a word, is the problem before us, and if the community cannot afford to support a hundred thousand instead of fifty thousand doctors—and you will readily agree that it cannot—every effort should be made to ensure that time and energy, as well as money, are not wasted in any system of service we are engaged in developing."

If this general principle is accepted, and I cannot admit that it is controversial, it must be applied much in the same way to institutions as it is to individual doctors. The crying scandal of long lists of patients waiting for admission is an indictment of our hospital system, indicating, as it does that the guilty institution has not the requisite time to perform its proper functions and that either an increase of accommodation and staff or a redistribution of its clients is urgently needed. How long will the public tolerate these lengthy waiting-lists and indeed, how long will it put up with the hours of waiting for attention in the outpatient departments of all large hospitals?

OUTSIDE INFLUENCES

And these questions lead naturally from the consideration of the intrinsic difficulties of medical practice to those which are exerting their influence from outside, from the changing social and economic circumstances of the population which the profession has to serve. During the period which I have under review there has been a rapidly spreading tendency on the part of all classes of society to seek help from hospitals in times of sickness or injury and to expect such help in return for smaller or larger payments or contributions. The purely charitable basis on which many of our hospitals were founded and long maintained is fast disappearing in practice and few of them could carry on today without the financial support of their patients.

The reasons for this great change are not far to seek. With the advance of medical knowledge to which I have referred modern methods of diagnosis and treatment have become so much more intrinsically expensive and so much more dependent on specialised skill in their application that many of them are not available except in institutions. On economic grounds alone this must continue and any new scheme of hospital service must provide for the accommodation and treatment of patients varying over a wide range of income. And if further argument were necessary we have only to remind ourselves that social and domestic conditions permit few households to stand the strain of long illnesses and skilled nursing at home. Assuming then that the investigation of obscure cases of illness and that the medical and surgical treatment of many patients who are seriously ill or injured will become increasingly recognised as the functions of the hospitals we are obliged to anticipate a change in the scope and character of general practice. That this may not be in complete harmony with the present rôle and source of livelihood of the general practitioner is true enough, but it can hardly be doubted that, for the purposes referred to, members of the public are better off in specially equipped and specially staffed institutions, even if, for a time they cease to be under the direct control of their own doctors. This point will be further elaborated at a later stage but before leaving the question of medical practice a few words must be devoted to one aspect of it which cannot be very far from the thoughts of all of us and which presents a very difficult problem.

I refer to the custom, of very long standing, in accordance with which a large proportion of practitioners depend for a great part of their incomes on patients whom they attend on a fee-per-visit basis. While this principle, so easily open to abuse, has been carried out in general with great fairness and honesty it remains fundamentally wrong in that it discourages that intimate relationship between patient and doctor whereby the latter should be the guardian of the former's health. It is impossible to argue that such a system is anything but an obstacle in the path of public health and of preventive medicine. The preservation of health and the prevention of disease, in themselves of far greater interest to the welfare of the community as a whole than remedial medicine, should be, but are far from being, the chief concerns of the general practitioner in his client's home.

If National Health Insurance was established by the state with the intention of giving the manual workers of the country the advantage of medical service without fees and of so encouraging them to consult their doctors as the protagonists of their health as well as the alleviators of their suffering, the result has not fulfilled expectation. Too large panels are fatal obstacles and the separation of wage-earners from their dependants in the scheme of benefits makes it even more difficult for panel practitioners to play the part of priests of preventive medicine in the homes of their patients. Nor did the scheme afford the practitioner ready access to skilled method and skilled advice for the early recognition of ill health in his clientele.

It is easier to expose the evils of practice based on the fee-per-visit system and to show how the National Health Insurance scheme has so far failed to overcome them than it is to suggest an improvement. On the other hand it is difficult to avoid the conviction that in some form of comprehensive, well-organised and perhaps compulsory insurance lies the solution of this old and elusive problem.

Preventive Medicine

The other great branch of practice, that of public health and preventive medicine, also is a child, less than a century old, but a child of the state. It, too, exhibits precocities of growth and promise of further development. It has already accomplished much in its fight against slums, dirt, infection and industrial disease. It has done much indeed for the health of mothers and children. In short, the history of our public health services is one of which our country may be justly proud. Those of us who worked in the outpatient departments of great city hospitals at the end of the last and the beginning of the present century are best able to appreciate the amazing improvement in habits, behaviour, cleanliness and nutrition which is to be found in the denizens of those departments today, and which can be credited very largely to the progressive policy of some of our governments and of some of our local authorities.

So far, so good, but can we be satisfied that the way is wide open for further advance? The servants of the state and the local authorities have reached the outer defences of the home but their good influence has not yet really passed its threshold. And can further progress be made unless the cooperation of the general practitioner within the home is enlisted? Provision for environmental hygiene has been developed along sound lines but its efficacy has been largely discounted by inadequate alliance with the general practitioner who should be responsible for personal hygiene if we are to see great strides made towards the attainment and maintenance of good health by the public.

It is easy to be wise after the event, but looking back one is forced to the conclusion that the establishment of panel practice, without radical changes in the medical curriculum, was an ill-advised step and has proved an obstacle in the path of preventive medicine. At the present time we have on the one hand the great bulk of the profession subsidised to combat established ill health without the modern equipment necessary for the purpose, and, on the other hand, a smaller number of whole-time officers paid to preserve the health of the community but without the personal and domiciliary contacts essential for the success of their tasks. And this schism of interests is likely to persist, interfering with the progress of preventive medicine and of public health, unless measures are taken to deal with the faults at their source. And what are the faults?

THREE BASIC DEFECTS

In the first place a man who goes into panel practice has received little instruction in the subjects of the preservation of health and of the prevention of disease. His attention has been directed almost entirely to the diagnosis and treatment of disease, and mainly of established disease, rather than of early and slight departures from health.

In the second place under the prevailing organisation the panel practitioner has not the time nor the facilities to devote to his chief objectives, the preservation of health, the prevention and the early diagnosis of disease, even if his previous training had been directed to that end.

In the third place the whole subject of Social Medicine has been, and is being, neglected in this country. While advantages accruing from some degree of local elasticity and from some scope for experiment in the various regions concerned A large body of professional opinion which looks askance at a State Medical Service, may not be unwilling to accept a federal union of regional health services looking for general guidance and support from the state Under such a system the problems confronting each regional health authority would vary in accordance with the size character distribution and occupations of its community, but the ultimate object of its activities would always be the good health of the people entrusted to its care

A regional health authority might well be able to solve more easily than any central authority two of the problems to which I have already paid some attention In the first place it could so organise the profession within its area that waste of time and energy and money could be avoided by means of common clinics and common services by the provision of consulting-rooms attached to hospitals and of ample pay-bed accommodation where it is especially needed In the second place it could promote in every way a complete working alliance of the public health officers with the general practitioners so that environmental and personal hygiene would eventually become the mutual object of the combined forces fighting in the cause of preventive medicine

* * *

It is not for a physician, much less for a Harveian orator to indicate or discuss the financial issues raised by the reorganisation of our health-services. These are the concern of the public for whose benefit the services are designed On the other hand I may be allowed to emphasise the folly of false economy when dealing with the conservation of the nation s most valuable asset In various ways our modern so-called civilised state is content to destroy with one hand the health which it is at pains to promote with the other It ignores for instance the teachings of science in the sphere of genetics · it does not hesitate to throw its best breeding stock into the furnace of war and it spares no effort to foster the unfit at the expense of the fit Is it too much to ask in return that those who survive the results of this racial ruin may be served by a profession sufficiently well subsidised to attract its due share of the best brains in the country ? Reconstruction with second- or third-class material is rarely or never profitable in any field , reconstruction in medicine under such conditions would endanger the whole future of the social state if not of the race itself

One final word The changes in the organisation of the profession which are here suggested, if agreed upon, must be based on changes in the education of medical students and on intensified study of the social factors underlying the health of the nation Prevention is better than cure

---

Messrs Allen & Hanburys announce a new model of the Bonochord ' hearing aid called the Table Model T 60 For this is claimed a maximum amplification of 60 decibels (one million times) a frequency range of 125–8000 cycles per sec and a reduction in weight of 1¼ lb The first two features are more than adequate for all ordinary purposes and for all but the severest forms of deafness, and the third is a much-needed improvement The bulk and weight of most valve-amplifying hearing aids has always been a deterrent to their use Another disadvantage of most aids is the type of dry cell battery used for the low-tension supply The makers have here attempted to remedy this, and standard flash-lamp batteries are used ; this also reduces the weight Where there is an individual preference for accumulators a model of this type can be provided and low-tension batteries obviated Filter circuits are also incorporated modifying the performance of the aid so that particular frequency ranges are selected for optimum amplification, in accordance with the type of deafness

Messrs G T Merson (Edinburgh) manufacture a suture silk which they claim is non capillary serum-proof and non-irritant The product is marketed under the name of ' Mersilk and is available in a wide range of gauges It is supplied unsterilised on reels carrying 25 yards or sterilised in vials

SUPERFICIAL GRANULATING AREAS TREATED WITH ANTISEPTIC EMULSIONS

R M Heggie, M B , B SC GLASG
LATELY SURGEON LIEUT -COMMANDER, R.N V.R.

E A. Gerrard
M D MANCH, M R.C O G

J F. Heggie
M B , B SC GLASG

SURGEON COMMANDERS, R.N V.R.

In collaboration with

C G Bradbury, M.P.S
P. J Morrison, M.P.S
W Stout, M.P.S

(*From a Royal Naval Auxiliary Hospital*)

There is a place for simple methods in the treatment of many cases of infected superficial burns now encountered During the last 18 months we have employed lymphagogues followed by antiseptic emollient dressings with considerable success Lymphagogues proved most effective in the removal of gross infection and in the separation of sloughs. The depot of antiseptic in the emulsions was then usually capable of completing and maintaining the sterility of the area while the emollient character of the dressing preserved the recently healed tissue when changes were necessary.

Acriflavine emulsion *BPC* was first employed Results were only moderately good since the degree of residual infection which can be dealt with is small on account of the limited diffusion of acriflavine. This is due partly to the small amount of acridine dye contained—1 in 1000—but chiefly because the dye acriflavine like proflavine is immobilised in the cera alba (melissyl palmitate and stearate) in which it is very readily soluble and from which it diffuses but slowly (see table)

COMPARISON OF SOLUTION OR ABSORPTION BY EMULSIFYING AGENTS OF PROFLAVINE FROM WATERY SOLUTION 0 4%, AND RECOVERY OF DYE FROM DISSOLVED OR ABSORBED EMULSIFIED STATE One weight of emulsifying agent with three weights of water Temperature 90° C Time, 2 hours in each case

Emulsifying agent	Removed from dye in watery solution (%)	Recovered from dye in emulsifying agent (%)
Cera alba	99	0 2
Adeps lanæ (anhyd)	10	50
Lanette wax SX	95	50
Vaseline	0	

We prepared a large series of less stable emulsions of the water-in-oil and oil-in-water types and by diffusion against serum and plasma estimated the effective concentration of antiseptic available from each

COMPOSITION OF EMULSIONS

Water phase—For this we chose and modified the buffered isotonic proflavine sulphate solution suggested by Russell and Falconer[1] for use in head injuries This solution (pH 6 2) does not interfere with fibroblasts or leucocytes and proflavine is the best of the acridine dyes whose activity is unimpaired by serum and blood The concentration of proflavine sulphate we increased from 0 1% to 0 4% and urea was added to the extent of 5% with a view to aiding the effective diffusion and penetration of the antiseptic dye into the granulations. Our first solutions were borate-buffered and hypertonic, but after correcting the tonicity we substituted phosphate buffers for we found that the proflavine was precipitated from this almost saturated (0 4%) borate-buffered solution probably through the formation of urea borate

Oil phase and emulsifying agents—The liquid paraffin of the *BPC* acriflavine emulsion was retained as the oil phase on account of its neutral character and excellent lubricant properties The amount in our standard emulsion was 45% (it is 75% in the *BPC* preparation) and in our other emulsion 15% Recently to economise in liquid paraffin we have reduced the amount in our standard emulsion from 45% to 20% and added adeps lanæ (anhydrosus) 20%

Oil-in-water (O W) emulsions were constituted so as to behave as " wet dressings " from which the proflavine

---

[1] Russell D S and Falconer M A *Brit J Surg* 1941 28 472

CLINICAL EDUCATION

During the next 3 years the student's attention is largely concentrated on the study of human pathology He needs, at the beginning, to become familiar with the fundamental principles of general pathology and bacteriology and throughout this period to reinforce that acquaintance by observations in the laboratory and post-mortem room as well as at the bedside The natural history of disease and the recognition of its early signs are subjects on which emphasis is naturally laid by his teachers who, for the most part, have chosen diagnostic and remedial medicine as their particular branch of the profession This is only right and proper, but, in the interests of the majority of students who are destined for general practice or public health work, more of their energy and time than has been hitherto the case should be devoted to other aspects of their future work In all recent attempts to review and revise the medical curriculum stress has been laid on such defects as the lack of attention to preventive measures to the relative paucity of facilities for the study of minor ailments and to the need for more systematic instruction in psychological medicine There is room, perhaps, for a larger and more varied panel of teachers and a reconsideration of their responsibilities Greater use, too, might be made of other health and social services and of other institutions for that purpose It may be that such changes, which are generally agreed to be desirable in the clinical phase of the curriculum, will not be carried out until alterations are made in the status, appointment and duties of the teaching staffs of medical schools and until the coordination of hospital services has come into effect

It is unnecessary to elaborate further the reform of the clinical period of the curriculum if its essential purpose, the preparation for a basic qualification common to all branches of the profession, is kept in mind In laying out this field of reconstruction there is ample scope for weeding as well as for sowing and planting

APPRENTICESHIP

Following the successful passage of the examination required for a basic qualification the student is faced by a choice of several careers for each of which a further period of apprenticeship, of varying length, should be an obligation

For those who look forward to the remedial and academic branches of our profession the apprenticeship is already fairly defined It may be summarily described as a long and laborious ascent of the institutional ladder sufficiently subsidised, as one would hope, for all to attempt who are otherwise adequately equipped for the higher rungs

For those who look to general practice for their livelihood apprenticeship should be less prolonged and might well be divided between a resident appointment in a hospital and a short period of attachment to a department of social medicine or to one of the social services

For those entering the public health service a somewhat lengthier apprenticeship on similar lines leading up to the attainment of a diploma might well be devised

General Considerations

There has now been submitted, in skeletal form and obviously capable of modification a plan for the reconstruction of medical practice which requires for its execution some readjustment of long-standing conceptions and conventions Such readjustment is in some instances desirable and in others probably inevitable In examining this plan and its implications we may start with three assumptions

(*a*) that the preservation of health and the prevention of disability in a community are the highest aims of a medical service whether looked at from the humane or from the economic point of view,

(*b*) that the state, in its response to the demand for social services, will not only make increasing provision for the fulfilment of these aims, but will acknowledge the claim of every member of the community when disabled, whatever his means, to the best that the medical profession can offer for his restoration to health,

(*c*) that in cases of serious disability skilled diagnosis and treatment must pass more and more into the hands of specialists and hospitals

EFFECT ON GENERAL PRACTICE

We may now consider the implication of the plan I have submitted on general practice and how the latter is affected by the three assumptions I would suggest that, in the future, with the training I have described and with easy access to skilled help in diagnosis and treatment for his patients, when necessary, the general practitioner would be better equipped to perform his primary duties He would be qualified too to advise his clients on such questions of personal hygiene, genetics and nutrition as affect the well-being of the family In the prevention and early detection of departures from good health he would find a greater interest and more satisfying results than he would as the doctor whose help is only called upon when ill health has established a footing in the home If he were so minded he could contribute largely to the advance of medicine in the little explored fields of social medicine and in many instances would be encouraged to take a part in public health activities and clinics In some districts hospital appointments would be open to him by means of which he would be in a position to increase both his therapeutic skill and his income

In order to secure a career as attractive as this certain conditions are essential The problem of adequate time for the efficient discharge of his duties, a subject to which I have already referred, must be solved by the limitation of his clientele, by ceasing to look for his livelihood to patients by whom he is paid per visit by ample provision of hospital accommodation and specialists within his reach and perhaps by sharing essential offices and other services with other practitioners

But beyond and above all these essentials there is another of even greater importance The attitude of the public towards health and disease, although more enlightened than it was twenty or thirty years ago is still far from helpful or satisfactory There remains more than a suspicion in many minds that illness is an act of God, something which is inevitable and dependent more on bad fortune than on neglect or ignorance The public is not yet alive to the advance of scientific medicine and to the light which has, in recent years, been thrown on the dark places of ætiology and pathology Speaking generally, they are far more concerned with cure than with prevention It is a change in the attitude which is essential for the general practitioner's success and there is no better or speedier method of bringing about that change than education by the practitioner in the home and in the clinic I do not think it is altogether unjust to accuse the medical profession of having pushed the dramatic and magical aspects of remedial medicine rather further than they deserve and of having drawn too little attention to the progress and importance of preventive measures While we welcome the efforts which have been made in recent years to enlighten the public in matters of health more can yet be done, and done better

REGIONAL ORGANISATION

We have been left in no doubt as to the intentions of the Government in regard to the coordination of hospital services after the war The Minister of Health has adumbrated a scheme by which hospitals will be grouped together within regional areas for the purpose of providing remedial services for the whole population within those areas, controlled by an authority which has, so far, not been exactly determined but which, one may hope, will be carefully chosen, experienced and free from political influence It is quite impossible to devise such a scheme successfully without taking into account the intimate relationship of hospital to other health services and particularly to those supplied by the general practitioner, an aspect of the problem which deserves more attention than it has hitherto received May it not be that the interests of the community and of the profession would be best served by making regional authorities responsible for the coordination of all health services within their areas, under the general control of the Ministry of Health? A wider scheme, such as this, would constitute a National Health Service with the lphate was then of value, a dosage of 20–24 g in 6 rs being used

FORMULÆ

ffered isotonic proflavine sulphate urea solution (P U sol)

	(g)
Sodium phosphate anhydrous (Na_2HPO_4)	1 79
Sodium chloride	7 96
Urea	50
Proflavine sulphate	4
Water to	1 litre

Standard proflavine urea emulsion (W/O type)

	(%)
U solution	40
nette wax SX	5
seline	10
quid paraffin	45

Standard P U emulsion (W/O type)—liquid paraffin saving

	(%)
P U solution	50
Vaseline	10
Adeps lanæ anhydrosus	20
Liquid paraffin	20

Proflavine urea emulsions (O/W types)

	Cream (%)	*Paste* (%)
P U solution	75	75
Liquid paraffin	15	15
Lanette wax SX	5	10
Vaseline	5	

Sodium sulphate emulsion (O/W type)

	Parts
Saturated aqueous solution sodium sulphate	75
Liquid paraffin	15
Unemul	10
Lanette wax SX	3–5

Recently we have made emulsions incorporating the lphonamides, partly in solution and partly in suspenon We have not yet tried them on infected burns, it using sulphathiazole or sulphapyridine we have had ood results in impetigo The formula is as follows

Sulphonamide emulsion

	(%)		(%)
lphanilamide, sulphapyridine or sulphathiazole	5	Water	60
ycerin	5	Vaseline	5
		Lanette wax SX	10
		Liquid paraffin	15

Diffusion experiments against serum and plasma ow that the solubility of each sulphonamide in the ternal solute is approximately two-thirds that of the rresponding sulphonamide powder in undiluted serum his rate may be reduced by the use of the base of the andard water-in-oil type of emulsion

The substitution of cod-liver oil for liquid paraffin in e standard type of emulsion of W/O type provides, for ose who prefer to use cod-liver oil in the treatment of urns, a convenient antiseptic-coagulant emulsion he urea would of course be omitted in this case from the uffered solution

Buffered proflavine cod liver oil emulsion (W/O type)

	(%)
Buffered isotonic proflavine sulphate solution	40
Lanette wax SX	5
Vaseline	5
Cod liver oil	50

Proflavine oleate 1% in cod-liver oil, with or without a nall amount of vaseline, would make an excellent ntiseptic preparation for the initial treatment of burns

CASE-RECORDS

The following are representative of the cases treated nd the results obtained[‡]

CASE 1 —Stoker, aged 25, burned from flash back of an l burner on Aug 5, 1940, sustaining 1st degree burn of ght forearm and 2nd degree burn of left arm, forearm, rist and hand (dorsum) Gentian violet applied to fingers nd tannic acid compresses to left arm and forearm, later placed by picric dressings Left arm became infected with ainful swelling

On admission, Aug 18, large granulating area involved ost of left arm forearm and hand Picric dressing removed with difficulty Area cleaned P U emulsion (W/O type) applied and left for a week, when dressing renewed Granulations healthy and cultures sterile More than half area healed By Sept 1, 26th day since injury and 14th day since applying emulsion, area had healed completely Newly formed skin was covered with some waxy scales of drying emulsion

Area granulating on Aug 18 was size of sheet of foolscap paper, 636 sq cm, and on Aug 26 was 247 sq cm Average rate of healing, 5 sq mm per mm circumference per day Time from injury to complete epithelialisation, 26 days

A year and five months after the injury (Jan 11, 1942) the surgeon lieut commander of this man's ship writes, "There is no evidence of scarring, the skin being normal, and he possesses a full range of movements"

CASE 2 —Stoker, aged 20, sustained 2nd degree burn of left foot (boiling water) on Oct 20, 1940 Blisters removed, 'Tannafax' and tannic acid compresses applied, followed 2 days later by compress of tannic acid 10% and acriflavine 1/1000

On admission, Oct 25, coagulum was separating on account of infection *Staph pyogenes* isolated Dressing removed, area cleaned, and crystal violet and brilliant green painted on skin margins P U emulsion (W/O) applied During next 6 days moderate pyrexia, T 100 4° F Sulphanilamide, 23 g given and temperature became normal Nov 1, dressing taken down, coagulum almost separated, removed *Staph pyogenes* still present Sodium sulphate emulsion dressings for 2 days Nov 3, wound clean, cultures sterile Skin margins repainted P U emulsion (W/O) applied and area closed Nov 10, dressing renewed, area almost healed Nov 15, 26th day, completely epithelialised Nov 17, allowed up, pain in foot due to ecchymosis of almost entire recently healed area 'Viscopaste' bandage applied and pain relieved Patient discharged to sick leave Dec 8, ecchymosis almost faded and area well healed

On Oct 25, 1940, area healed was a tenth that of granulating surface, granulating area, 392 sq cm Nov 1, granulating area, 220 sq cm Rate of healing 1st period (moderately infected), 2 45 sq mm per mm circum per day, 2nd period (aseptic) 5 6 sq mm per mm circum per day Time from injury to complete epithelialisation, 26 days

CASE 3 —Merchant seaman, aged 23, injured in explosion on June 3, 1940, sustaining, among other things, 2nd degree burns of left shoulder, arm, forearm and chest June 22, areas grafted, those on left forearm failed and area became infected, others successful July 8, P U emulsion (W/O) applied to forearm and changed at 4 day intervals Area sterile at 8th day After third application of emulsion exuberant granulations required blue stone These recurred with further application but were prevented thereafter by using emulsion from which urea was omitted Aug 10, 68th day since injury, area of 67 5 sq cm had healed completely

Average rate of healing, 0 68 sq mm per mm circum per day Time to heal from application of emulsion 33 days

A year later, Sept 28, 1941, patient writes, "I would not say there is much of a scar, doctor, but the skin on my forearm is drawn, and there are white blotches spreading from the centre of the wound"

CASE 4 —C P O cook, aged 44, sustained multiple and extensive burns, mainly of 2nd degree, on Nov 10, 1940, when copper of boiling water upset over him in heavy seas Areas cleaned and tannafax applied In hospital ship all dressings found adherent Areas of 3rd degree injury at ankles showed some infection Moderate pyrexia, 12 g sulphapyridine given

On admission, Nov 20, extensive superficial (2nd degree) granulating areas of back, arms, chest, buttocks and thighs Most of tan was disturbed in transhipment Tan removed, areas cleaned and skin margins painted with dye No necessity to graft, so P U emulsion (W/O type) applied on gauze All these areas healed by Dec 16, 36th day from injury In ankle regions, 3rd degree injury, tan very adherent Applications of sodium sulphate emulsion followed by P U emulsion (O/W) When areas were clean and cultures sterile, P U emulsion (W/O) applied and changed weekly Jan 1, 1941, 51st day from injury, right foot healed Jan 24, 75th day from injury, left foot healed

One year after injury, Nov 26, 1941, the surgeon lieutenant of the man's ship writes, "This rating's skin has now completely healed with slight scarring throughout but with no contractures or disabilities whatsoever"

Prof W C Wilson of Aberdeen University has also employed the proflavine emulsions with success and has referred to their use (earlier formula) in the Ministry of Health publication Emergency Medical Services Instructions part I Medical Treatment and Special Centres Appendix D 1941 of the abundant buffered isotonic water phase (75%) would be available in requisite concentration, readily and speedily, within a day or two, to sterilise the granulating areas Water-in-oil (W/O) emulsions were made as water-creams (40%–50% water) and were designed to be used as occlusive dressings for cases of light or reduced infection in which the main object was to leave the area quite undisturbed until healing was complete, or for not less than 7 days The antiseptic action and possible side actions of the proflavine, among them retarding of the reparative processes, were self-limiting when used clinically, chiefly by reason of evaporation of the water-phase, the sterile dye-stained thin unguent then remaining formed a protective layer over the granulations until epithelialisation was complete

'Vaseline,' in which, as in liquid paraffin, the acridine dyes are insoluble, was used to replace the unsuitable cera alba as an emulsifying agent Adeps lanæ (anhydrosus) was equally suitable We also used 'Lanette Wax SX'* and in one special instance 'Unemul'†

Lanette wax SX is a partially phosphated cetylstearyl alcohol which is neutral and entirely free from fatty acids and impurities and is easily self emulsifiable in water to the O/W type of emulsion It ranks high as an emulsifying agent, for while the emulsions formed are neutral they can be adjusted to be stable to a reasonable pH on the acid or alkaline side Commercially, lanette wax SX is used in many cosmetic creams, the water content of which is about 75% We were thus able to prepare emulsions, medium or thick creams, in which the water phase was three times the oil phase Proflavine is easily soluble in lanette wax SX but diffuses fairly freely (see table)

Unemul is an activated aluminium hydroxide much used as an emulsifying agent, small amounts (5–10%) being required to form stable emulsions It has the added advantage of being an adsorbent and was selected to fill a dual rôle in our O/W emulsion of saturated aqueous sodium sulphate, used as a lymphagogue in the initial cleaning of heavily infected areas

DIFFUSION

The effective concentration of available dye from each emulsion was measured at intervals of from 5 min to 48 hr. at 37° C, using 5 c cm emulsion spread on a standard area of gauze in a petri dish and 10 c cm serum or plasma as external solute As expected the resulting concentration varied with the amount of the water phase, the character of the emulsifying agent, and the rate of change of the external solute Under these conditions, acriflavine emulsion *BPC* yielded concentrations of from 1/10,000 to 1/6000, while the buffered isotonic proflavine emulsions (W/O) gave 1/4000 to 1/3500, and the O/W emulsions 1/2500 to 1/2000 When it is remembered that in these experiments the volume of the external solute was twice that of the emulsion, it will be conceded that the concentration will be greater (nearer 1/500) when the emulsion is applied to a granulating surface, for there at any one time the volume of exudate or of fluid in the superficial tissue spaces in contact with the emulsion will be less The concentration of 1/500, or 0 2%, is what we have aimed at, for in this amount the acridine dyes will disinfect in a short time[2] Recently we have obtained this "target" value in vitro using the BDH preparation of proflavine oleate, 1% in liquid paraffin, but so far have lacked opportunity to use this preparation on infected burns Young and Charteris[3] found this solution useful in cases of infected new-growths of the accessory nasal sinuses A "tullegras," containing 1% proflavine oleate in liquid paraffin, 60 parts, and vaseline, 40 parts, might be a suitable commercial product

EFFECT ON BACTERIAL FLORA

Gross infection was removed by the action of lymphagogues So also was occasional infection with *Pseudomonas pyocyanea*, which was little affected by proflavine When dressings were changed daily or every second day, as in our early cases, sterilisation was usually obtained by the 4th day In general, *Staphylococcus pyogenes* seldom persisted beyond the 6th or 7th day When the dressings were changed weekly this organism was occasionally obtained in culture at the end of th first but seldom after the second period

ACTION OF UREA

We are still undecided on the ability of urea to a the penetration of proflavine into superficial granulations, many more observations are necessary We have, however, noted the stimulating action of urea on the growth of granulations After repeated applications —twice or three times in 14–21 days—the granulations were exuberant and blue-stone had to be used The effect was absent when emulsions without urea, or sterile vaseline alone, were used Allantoin in similar emulsions did not exhibit this action Since results obtained from careful measurement showed such wide variation in the "normal" rate of healing of surfaces after sterilisation, it is impossible to say that urea or allantoin had any effect in stimulating epithelialisation However, the urea may have reduced the time of healing by stimulating the granulations and thus aiding the initiation of contraction in the early stages

This known stimulation of granulation tissue by the hyperosmotic action of urea is similar to the effect of hypertonic saline or sodium sulphate solutions on repeated application, and while of limited value in the treatment of infected burns can be turned to good account in the healing of deep granulating cavities Mr G A Mason reports excellent results in the healing of cavities encountered in thoracic surgery with our buffered proflavine-urea solution Sites from which carbuncles have been excised may be treated likewise

MANAGEMENT OF BURNS

Loosely attached portions of existing "tan" were trimmed or removed if possible, and sodium sulphate dressings applied Remaining tan became further loosened and was removed When this was not possible the lymphagogue dressings were followed by the oil in water emulsions for about three days The abundant water phase of this emulsion with increased antiseptic content rendered this potential source of infection sterile In most cases the granulations were easily "cleaned" The skin margins were painted with a watery solution of crystal violet and brilliant green, each 1%, and the water-in-oil emulsion was then applied as an occlusive dressing The emulsion was warmed to body temperature, spread liberally on two thicknesses of gauze, and applied to the area so as to include the margins A further two or four thicknesses of gauze and a layer of wool followed and the whole was strapped or bandaged and left for 7–14 days, according to the amount of exudate appearing in the superficial dressing Bandages were so adjusted, especially at the wrists and ankles, to allow movement of joints Superficial areas have been healed completely at the end of 14 days others have required to be re-dressed and left for a further 7–14 days The dressings were changed with moderate ease, most of the water phase had evaporated and a thin layer of "unguent" remained When dressings were firmly stuck, as when lesions were multiple and the usual amount of covering dressing delaying evaporation could not be applied, they were left undisturbed The oil phase in the gauze together with the exudate formed a "scab" In these cases friction over the dressings was minimised by the use of light gauze bandages In one patient who was badly burned both back and front (2nd degree) there was little difference in the rate of healing in the areas despite the fact that he was nursed on his back and later sitting up When the lower limbs were affected the patients were kept in bed for a week or so after epithelialisation was complete In two cases which were allowed up too soon there was patchy and even diffuse ecchymosis from the innumerable relatively unsupported superficial capillaries

Our cases were placed on a full diet as soon as possible, with a liberal addition of protein in the form of cheese and eggs Extra vitamin C was given if urinary estimations showed an unsaturated state Iron was prescribed as required, but secondary anæmia was only occasionally encountered in long-standing cases Some patients were pyrexial, sulphanilamide or sulphapyridine in combination with active local treatment with sodium

---

* Ronsheim and Moore 4 Anne Boleyn's Walk Cheam Surrey

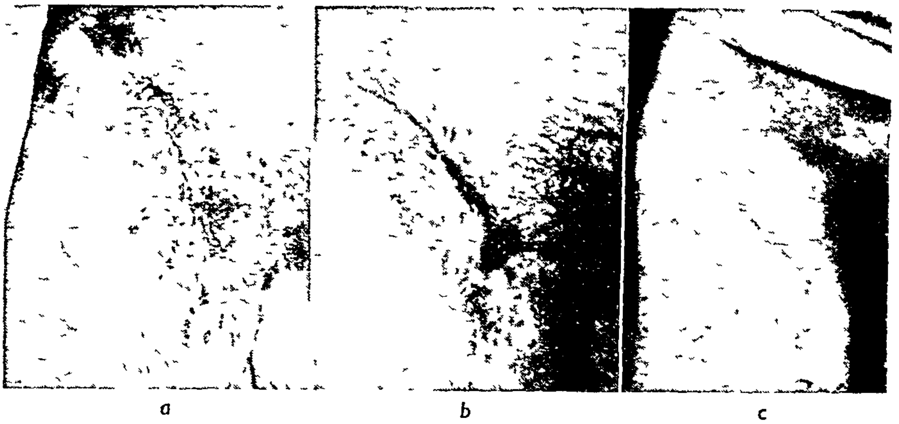
† Universal Emulsifiers Ltd Riverside Works Weybridge Surrey

[2] See Garrod, L P *Lancet*, 1940 i 802

[3] Young, G and Charteris, A A *Brit med J* 1940 ii 489

In this case some areas were treated with emulsions in which the urea was replaced by allantoin No acceleration of epithelialisation was noted Similarly, allantoin was found to lack the stimulating effect on granulations noticeable in the case of urea

In the next case, while it was recognised that grafting was the ideal form of treatment, it was thought that the antiseptic emulsion might be given a trial on this particular site (the inguinal region), an area subject to much movement and very liable to reinfection



Case 5 —(a) 2 months after injury, showing extent of lesion, healed and healing areas Marginal folliculitis was treated with crystal violet solution (b) About 3 months after injury (89th day) Epithelialisation was completed a week later (c) 14 months after injury

CASE 5 —*Leading stoker, aged 24* On Sept 1, 1940, caught boiler suit in a revolving shaft, sustaining lacerations Skin in right inguinal region was pulled off, and fascia and muscle exposed Very little bleeding Large deep lacerated wound sutured, skin of penis replaced Sept 15, skin of penis healed, much skin of deep wound necrotic, eusol applied preparatory to grafting

Transferred to R N hospital on Sept 27 Skin of penis well healed Groin wound, roughly oval with greatest length parallel to inguinal ligament Bulk of wound in groin but part involves skin of lower abdomen Small scar near anterior superior iliac spine where wound was shallow, towards symphysis pubis skin showed undermining and wound was 0 5–1 cm deep No evidence of marginal healing except scar mentioned After sodium sulphate dressings and painting of marginal skin with brilliant green and crystal violet, standard P U emulsion (W/O) applied on gauze and changed weekly Sulphanilamide, 24 g in 6 days, given in first week on account of pyrexia which settled in 4 days 2nd week, granulations at skin level 3rd week, granulations exuberant, blue stone, 4th week, granulations again exuberant, blue stone, sterile vaseline dressing 5th week, area infected with *Ps pyocyanea* during period of vaseline dressing, sodium sulphate dressings, P U emulsion (O/W) 6th week, granulations again exuberant, blue stone 7th week, further exuberance of granulations avoided by using emulsion from which urea was omitted, patient allowed up, rate of healing temporarily reduced 8th–11th weeks, during stationary period in rate of healing, several small shallow ulcers appeared in recently formed epithelial surface, bacteriologically sterile We considered them "tension ulcers"—increased stretching of the newly formed tissue, impaired blood supply, local necrosis These improved with rest and did not recur after movement when the tissue was older

The wound healed in 96 days, average rate 0 5 sq cm per mm circum per day (see figure) Narrow scar runs parallel *with inguinal ligament, no interference with movement* Fourteen months after injury area is well healed Scarring, which was somewhat keloid, is slowly disappearing Patient suffers no inconvenience, and has been back on duty for ten months

Here grafting would have reduced the time of healing and no doubt yielded a better result Nevertheless our treatment was worth the trial, for it demonstrated that healing of such deep extensive and ill-placed wounds can be achieved within a reasonable time if facilities for grafting are not available

SUMMARY

Simple and economical buffered isotonic proflavine emulsions of water-in-oil and oil-in-water types are described, note is also made of similar emulsions incorporating the sulphonamides

By diffusion against serum and plasma the concentration of available antiseptic dyestuff is estimated to be about 1/500 (0 2%) clinically, the concentration at which proflavine is more effective

After treatment with saturated aqueous sodium sulphate as a lymphagogue these proflavine emulsions have proved useful occlusive emollient dressings for superficial infected granulating areas, in particular for infected burns of second degree

Five illustrative cases are described, the measured rates of healing are recorded, and where possible the results a year after healing are given

Our thanks are to the Medical Director General of the Navy and to Surgeon Rear-Admiral H E R Stephens, R N, for permission to publish the case notes, and to Prof G M Wishart, Glasgow University and Dr T N M Morgan, Aberdeen University, for help with the buffering of our solution

---

CHEMICAL COAGULANTS IN THE TREATMENT OF BURNS

P B MEDAWAR, M A OXFD

(*Department of Zoology and Comparative Anatomy, University of Oxford*)

BURNS *differ from other traumatic* lesions not merely because they involve an extensive superficial loss of skin but also because of the persistence of a zone of dead tissue within the lesion itself Taken singly, neither property is typical, for the donor area of a Thiersch graft exhibits the first without the second, and other types of injury (e g a crush) may involve the second without the first

Coagulation therapy may be thought of as an attempt to solve two problems which are directly related to these properties of burns to form over the lesion a surface-seal or "tan," to restrict external fluid loss and to exercise a general protective and analgesic function, and to make dead tissue at all events physiologically external to the body, by converting dead tissue from being part of the lesion to being its most immediate dressing Since the tissue initially destroyed by a burn has been coagulated by heat, further coagulation might seem unnecessary or even dangerous Certain chemical coagulants can, however, form compounds with tissue proteins which are stable to the mechanical action of body fluids and totally resistant to digestion by proteolytic enzymes The first section of this paper describes the results of qualitative tests on coagulants to discover which of them is capable of "fixing" tissue *in this way* A second important factor regulating the choice of coagulants for application to burns is their penetrative power, for on this depends their ability to penetrate tissue far enough to coagulate it, but not so far as to cause significant new damage on their own account The relative penetrative powers of coagulants, including those commonly used for application to burns, are tabulated in the second section

FIXATION OF TISSUE BY CHEMICAL COAGULANTS

The coagulants considered in this section are picric acid, chromic acid, tannic acid,* silver nitrate, gentian violet, mercuric chloride, uranium nitrate, ethyl alcohol, formaldehyde and heat All of these fix tissue in the histological sense, which does not take resistance to proteolytic digestion into account, but they vary greatly in the stability of the compounds they form with protein. Picric acid, for example, can be washed out of tissue merely by prolonged irrigation with water. There must therefore always be a danger of systemic poisoning when it is applied to extensive burns.

---

* Different samples of tannic acid and tannins naturally differ greatly in their penetrative powers and other properties, such as the degree of contraction they bring about in fibrin fibres With the exception of the sample used in the tests described in table III tannic acid (BDH) batch 216422/410421, has been used throughout

Cylinders of clotted cockerel blood plasma (fibrin – serum protein) have been found suitable for the comparative tests described below. They are prepared by clotting plasma with traces of tissue extract in lightly 'Vaselined' glass tubes of uniform bore. After clotting, the plasma is shaken out and cut into equal lengths. A set of cylinders was fixed in each of the reagents listed above for a time known to be more than sufficient to secure thorough impregnation, and then washed in running tapwater (pH 7·6 approx.) for not less than 500 hours in order to remove any excess of coagulant. Cylinders fixed in tannic acid, chromic acid, silver nitrate and mercuric chloride remain hard and brittle after washing. Those fixed in the other coagulants return to, or in the case of gentian violet remain in, their original jelly-like state.

Table I records by means of arbitrary but consistent marks the resistance of fixed and washed cylinders to digestion by pancreatic trypsin and by pepsin at 37° C.

TABLE I—STABILITY OF CYLINDERS OF TOTAL PLASMA PROTEIN TO DIGESTION

Coagulant	Peptic digestion	Tryptic digestion
Silver nitrate	++	++
Formaldehyde	+++	+++
Mercuric chloride	++	++
Chromic acid	0	0
Ethyl alcohol	+++	+++
Tannic acid	+++	0
Picric acid	+++	+++
Gentian violet	+++	0
Uranium nitrate	+++	+++
Heat	+++	+++

0 = Completely stable; + = slow digestion; ++ = moderately rapid digestion; +++ = digestion at normal rate.

Trypsin solution.—Seitz filtered 1% suspension of BDH trypsin powder in Tyrode's solution containing 1 : 100,000 phenol red and adjusted by means of it to pH 7·8–8.

Pepsin solution.—5% v/v liquor pepticus *BPC* in N/20 HCl.

It can be seen that stability to trypsin does *not* necessarily entail stability to pepsin. Leucocyte trypsins are probably the most important enzymes concerned in attacking and undermining the dead tissue in burns, and there is no reason to believe that they differ from pancreatic trypsin in the properties recorded here. Tissue cathepsins, which might otherwise bring about autolysis of the damaged tissue, are presumably fixed with the other tissue proteins by the heat of the burn. Unfortunately they are not available in sufficient quantities to make extensive comparative tests possible.

Silver nitrate, tannic acid and gentian violet are the coagulants most widely used in the treatment of burns. Proteins coagulated by silver nitrate dissolve fairly readily both in pepsin and trypsin, and in each case the digestion fluid becomes cloudy with a fine suspended precipitate. This precipitate dissolves instantly in dilute ammonia or thiosulphate solutions, and almost completely in saturated solutions of sodium chloride. It therefore consists almost entirely of silver chloride, a fact which indicates that ionic silver is liberated during digestion. Proteins fixed by tannic acid and gentian violet are totally resistant to tryptic digestion at pH 8. This is not due in the former case to the liberation of sufficient tannic acid to precipitate the trypsin or to inhibit it (by acidity), though this reaction plays a part if the excess of tannic acid has not been removed from the cylinders by thorough washing. Tannic acid may be removed from the cylinders by digestion in a warm bath of 0·5% sodium-carbonate solution. The tannic acid is liberated as the sodium salt, and the cylinders return to a jelly-like state in which they are promptly dissolved by trypsin.

The results suggest that tissue fixed by tannic acid or gentian violet is stabilised to the action of body fluids, and that in burns coagulated tissue layers must be split off as intact sheets since they cannot be digested away. Silver nitrate, because of its secondary reactions, introduces special problems which are discussed below.

PENETRATIVE POWERS OF COAGULANTS

Since coagulants automatically destroy any living cells with which they come in contact, the second set of factors influencing the choice of coagulants for application to burns is that bound up with their penetrative power. A simple method for estimating the relative penetrative powers of coagulants has been described elsewhere (Medawar 1941). The coagulants are allowed to diffuse into a small tube of clotted lymph or plasma from an outside source maintained at some constant concentration and temperature. The coagulated band thickens down the length of the tube, and its depth, which can be measured to the nearest 0·25 mm. by a glass pointer mounted on a sliding vernier scale, is proportional to the square root of the time during which diffusion has been going on. The penetrative power can therefore be expressed as the factor by which the square root of the time (in hours) must be multiplied in order to arrive at a figure representing the depth of penetration in mm. The clinical equivalent of this experimental procedure is that of immersing a raw area in a bath of coagulant maintained at some constant concentration and temperature. The procedure advocated by Wells (1933) approximates to this.

The plasma gel is a convenient choice as a medium for diffusion because, although it is "solid" in certain technically important ways, it has the same type of physicochemical organisation as cytoplasm and intercellular fluid. Since connective-tissue fibres and cell walls will tend to retard the diffusion of coagulants, we can take it that the data of table II represent the *extreme* rates of penetration of coagulants into tissue, a rate which it is physically impossible for coagulants to exceed as a result of processes of diffusion alone. The data of table III cannot be given this direct meaning. They were collected for another purpose and represent penetration rates at room temperature. They therefore only serve to rank the principal coagulants in the order of their vigour as penetrants.

Tannic acid and gentian violet are outstandingly the most feeble penetrants of tissue among the range of coagulants examined. Tannic acid may be a violent reagent, but to describe it as a violent *coagulant* (see R.S.M. Discussion on Burns 1940) is misleading.

TABLE II—RELATIVE PENETRATIVE POWERS OF SILVER NITRATE AND TANNIC ACID AT BODY TEMPERATURE (37° C.)

Reagent		Penetrative power	Standard error
		(mm./$\sqrt{\text{hr.}}$)	
Silver nitrate (%)	10	4·15	± 0·04
	5	3·33	± 0·05
Tannic acid (%)	20	2·43	± 0·02
	10	2·06	± 0·02
	5	1·67	± 0·04

Tannic acid which has been neutralised, in this case by adding 1·8 ml. N sodium hydroxide per dissolved gramme, penetrates in each case much more slowly than the free acid of the same initial concentration.

TABLE III—PENETRATIVE POWERS OF COAGULANTS AT ROOM TEMPERATURE (FROM MEDAWAR 1941)

Reagent		Penetrative power	Standard error
		(mm./$\sqrt{\text{hr.}}$)	
Mercuric chloride, sat. aq. sol.		4·34	± 0·05
Chromic acid	1%	3·60	± 0·05
Cadmium chloride	1%	2·69	± 0·02
Picric acid, sat. aq. sol.		2·50	± 0·05
Silver nitrate	2%	1·82	± 0·05
Ethyl alcohol, abs.		1·71	± 0·02
Uranium nitrate	1%	1·36	± 0·03
Tannic acid	1%	0·43	± 0·01
Gentian violet	1%	very slow	

It can be seen from table II that increasing the strength of a coagulant does not proportionately increase its penetrative power.

The first visible reaction of a coagulant at a surface of superficial contact with a protein solution like plasma or serum is to set up an opaque, impermeable-*looking* and *more or less rigid coagulated film*. This film, like the band it later thickens into, is freely permeable to the diffusing coagulant. It does not, as is sometimes thought, set up an impermeable barrier which protects the protein solution underneath. If it did so the ratio between the depth penetrated by the coagulant and the square root of the time of diffusion would not remain constant, but would fall off slightly. The experimental evidence, so far as can be judged within the limits of observational error, is that this ratio does remain constant, in spite of the fact that the diffusing coagulant is used up by the proteins, and in some cases by other ingredients of the gel it fixes. There is therefore a fundamental distinction between coagulation by histological coagulants and that brought about (in the colloid chemist's sense) by animal and vegetable oils (Clayton, Thomson, and Howard 1941). Tannic acid can coagulate *in depth*, and as a result of diffusion processes alone. Taylor (1936), for example, has demonstrated the diffusion of tannic acid into the intact although feebly cuticularised skin of the rabbit.

DISCUSSION

Tannic acid and gentian violet are distinguished from the majority of coagulants by a combination of two distinct properties: excessively feeble penetrative power, and the ability to fix tissue in the sense described in the first section of this paper. Davidson (1925) introduced tannic acid as a coagulant in the sense which has been assumed in this paper to be the right one, as a tissue fixative. But the end-result of recent widely adopted techniques of application—e g, the alternate spraying and drying method of Beck and Powers (1926), and the combined silver nitrate tannic acid technique of Bettman (1936)—is not so much to fix tissue as to secure a quick, dry, impermeable surface seal. This reaction, although it may be accompanied by coagulation, should perhaps be distinguished from it as "tanning." The steady change-over from deep tissue fixation to the surface reaction of tanning reflects the increasing emphasis which has been placed on the factor of fluid loss, as opposed to that of toxæmia, in the clinical theory of burns. Silver nitrate is primarily a "tanning" agent. It is preferentially precipitated by the chlorides of the body fluids before attacking tissue proteins, and the fraction so precipitated is rapidly reduced to the metallic silver that forms the overt black tan. Bettman's technique cannot be said to combine the advantages of tannic acid and silver nitrate therapy, since the two reagents are pharmacologically incompatible. The function of tannic acid in this case is merely to facilitate the reduction of silver nitrate to metallic silver.

The estimates of penetrative power quoted in the second section of this paper were said to represent the extreme rates of penetration of coagulants into tissue as a result of processes of diffusion alone. The thickness of the coagulated crust formed on the surface of treated burns does not necessarily represent the depth to which the coagulant has penetrated tissue. These crusts may be formed by the building up of coagulated serous exudates in layers formed from the inside outwards.

SUMMARY

Two key factors regulate the choice of chemical coagulants for application to burns: their penetrative power and their ability to fix tissue in a sense which includes making them fast to the action of trypsin-type proteolytic enzymes.

Tannic acid and gentian violet are outstandingly the feeblest penetrants of tissue among a range of coagulants examined for this property, and they share with chromic acid, and with no other coagulant in this range, the power of making the tissues they act on totally resistant to tryptic digestion.

These facts suggest that tannic acid and gentian violet cannot cause new damage on their own account when applied to burns, and that the tissue they fix is completely stable to the action of the body fluids, and is to be thought of as a wound dressing rather than as part of the lesion itself.

Continued at foot of next column

PNEUMOCOCCAL MENINGITIS

SEVEN CASES WITH FIVE RECOVERIES

V N LEYSHON, M D LOND, D P H
DEPUTY MEDICAL OFFICER OF HEALTH, BLACKPOOL

THIS paper records the findings and treatment in 7 consecutive cases of pneumococcal meningitis admitted to the *Blackpool Infectious Diseases Hospital between* April and October, 1941; 6 were primary cases and one (case 1) was secondary to lobar pneumonia.

DIAGNOSIS AND TREATMENT

On admission the primary cases were all typical of purulent leptomeningitis, showing neck rigidity, Kernig's sign, photophobia and vomiting. Case 1 resembled enteric fever with unilateral pneumonic consolidation and it was not until the 3rd day after admission that the meningitis became apparent. Lumbar puncture was performed on 5 of the cases on arrival in hospital; case 1 was atypical, and lumbar puncture was not done until the 3rd day *after admission*. Cisternal puncture only was carried out on case 7. In all cases the cerebrospinal fluid was examined for the causative organism before chemotherapy was begun, because sulphonamides tend to prevent successful culture of the organism. Time is an important factor in the treatment of this still very dangerous disease especially when specific antiserum is to be used. In 4 cases the first specimen of CSF obtained by lumbar puncture was water clear, and in 3 of these no abnormality was found on cytological, chemical and bacteriological examination. Further *specimens* were obtained, and in all 7 cases the pneumococcus was found. It is my experience that a clear lumbar-puncture fluid is more often present in cases of pneumococcal meningitis than meningococcal meningitis, possibly because pneumococcal meningitis is a more localised disease. In this series when the lumbar fluid was found to be clear the cisternal fluid was usually turbid or opalescent; *for this* reason cisternal puncture is to be preferred *to lumbar* puncture in order to determine the causative organism promptly.

Treatment was by appropriate antiserum combined with chemotherapy. After a specimen of CSF had been obtained the patient immediately received 2 g of sulphapyridine by mouth, or intramuscularly if unable to swallow, with 10 c cm of a 10% solution of 'Soluseptasine' (M&B) intravenously. Thereafter, 9 g of sulphapyridine was given daily, by mouth or intramuscularly, with intravenous soluseptasine 12-hourly. This routine was followed until the complete cessation of headache, usually on or about the 5th or 6th day after admission. Then 6 g of sulphapyridine and one intravenous injection of soluseptasine daily were given over a further period of 2–3 days, *after which all drug treatment* was stopped. This dosage applies to adults and is modified according to age for children.

As soon as the pneumococcus has been isolated, which usually takes 24–48 hours, the appropriate antiserum is introduced into the cisterna magna once daily for 3–4 days in doses of not less than 20,000 units. A stock of antiserum is always kept at hand so that delay is avoided. The maximum amount of antiserum used per injection has been 40,000 units (4 ampoules—about 6 c cm—of serum). In cases secondary to infection elsewhere antiserum should be given intravenously in daily doses of not less than 20,000 units as well as intracisternally. If headache or restlessness is severe the patients are given morphia gr ⅙–¼, up to a maximum of gr ½ *daily*.

MR MEDAWAR

I should like to express my gratitude to Dr J M Barnes, Mr S M Cohen, and Colonel Leonard Colebrook for their advice *on problems of burn therapy and for their criticisms* of the paper.

REFERENCES

Beck C S and Powers J H (1926) *Ann Surg* 84, 19
Bettman A G (1936) *Surg Gynec Obstet* 62 458
Clayton, W Thomson, D Howard A J (1941) *Lancet* i 341
Davidson, E C (1925) *Surg Gynec Obstet* 41 202
Medawar P B (1941) *J roy micr Soc* 61 46
Taylor F (1936) *J Amer med Ass* 106 1144
Wells D B (1933) *Ibid* 101 1136

TREATMENT AND RESULTS IN SEVEN CASES OF PNEUMOCOCCAL MENINGITIS

Case	Sex	Age (yr)	Duration of illness before treatment	Sulphapyridine (g)	Soluseptasine (10% sol) (c cm)	Antiserum intrathec (units)	Result	Cerebrospinal fluid: Lumbar punc	Cisternal punc	Appearance	Protein mg (per 100 c cm)	Globulin	Cells per c mm	Film (deposit) pneumococci	Cultures
1	M	42	8 days	4 5 in 12 hr	20 in 12 hr	20 000	Died*	1	1	Cloudy greenish	240	++++	8200 (p 87 l 10, e 3)	Many	Good growth (type I)
2	M	33	10	63 5 in 7 days	140 in 7 days	20 000	Recovered	2	None	Cloudy faintly greenish	400	++++	28 000 (p 92 l 7, e 1)	Scanty (type I)†	Sterile
3	M	29	2	56 5 in 6 days	140 in 7 days	70 000		1	2	Turbid	100	+	7400 (p 88 l 10, e 2)	Scanty	,,
4	M	30	6	80 in 9 days	120 in 6 days	Nil	Died	2	1	Cloudy	300	++++	12 000 (p 78, l 16 e 6)	Few doubtful	Mixed growth (type I)‡
5	M	19	5	57 5 in 7 days	140 in 7 days	60 000	Recovered	1	2	Turbid	180	++	1960 (p 88 l 10 e 2)	Occasional (type I)†	Sterile
6	M	5	6	36 5 in 7 days	15 in 2 days	130 000		1	4	Turbid large clots	500	+++	19 400 (p 93 l 5 e 2)	Occasional	Moderate growth (type I)
7	M	29	4	54 5 in 7 days	120 in 7 days	70 000		None	3	Turbid	150	+	860 (p 88 l 10 e 2)		Good growth (type I)

* Associated lobar pneumonia † Direct typing by Neufeld reaction ‡ *Pneumococcus* predominating over *Micrococcus tetragenus*
p = polynuclears %, l = lymphocytes %, e = endothelial cells %

CASE-HISTORIES

CASE 1—Man of 42 admitted April 4, 1941 Atypical case Before admission had been recovering from lobar pneumonia, for which had had sulphapyridine Had been drowsy for 5 days with severe diarrhœa and was admitted with diagnosis of enteric fever, which his condition closely resembled Kernig sign and neck rigidity absent slight headache Diarrhœa became worse on April 5 and vomiting began next morning with neck rigidity and Kernig sign Rapidly became comatose during day and died without recovering consciousness 12 hours later Received routine treatment only for 12 hours before death

CASE 2—Man of 33 admitted June 13 with 10 days history of headache and vomiting All signs and symptoms disappeared on 6th day after admission and patient was discharged symptomless and without sequelæ after 27 days in hospital

CASE 3—Man of 29 admitted July 17, second day of disease All signs and symptoms disappeared on 8th day after admission and patient was discharged fully recovered and without any sequelæ after 35 days in hospital

CASE 4—Man of 30 admitted Aug 23, on 6th day of disease Became steadily worse was comatose for last 3 days, and died 10 days after admission No antiserum used

CASE 5—Man of 19 admitted Sept 19 on 5th day of disease All signs and symptoms disappeared on 7th day after admission and patient made perfect recovery without sequelæ and was discharged after 42 days in hospital

CASE 6—Boy of 5 years admitted Sept 26 after 6 days' illness Semi-comatose, collapsed on Sept 27 and 28 artificial respiration, carbon dioxide oxygen and 'Coramine' administered Severe opisthotonus on Sept 28, but this disappeared on 30th Considerable cyanosis on Sept 29 put in oxygen tent for 2 days with slight benefit All signs and symptoms disappeared on Oct 3 and child made perfect recovery without sequelæ after 39 days in hospital

Blood count on Oct 7 red cells 3,250 000 per c mm, Hb 66 9% (Newcomer), 10 2 g %, colour index 1 07, cell volume 27 2 c cm per 100 c cm of blood, mean cell volume 80 5 cµ, mean cell concentration 37 5% white cells 18,000, neutrophils 45 5%, eosinophils 1% lymphocytes 47% monocytes 5 5%, smear and basket 1% Moderate normocytic normochromic anæmia with slight neutrophilia and definite lymphocytosis and monocytosis

CASE 7—Man of 29 admitted Oct 7 after 4 days' illness All signs and symptoms disappeared on 6th day after admission and patient made complete recovery without sequelæ and was discharged after 35 days in hospital

The treatment given and the CSF findings are shown in the table

DISCUSSION

Meningococcal and pneumococcal meningitis both respond favourably to chemotherapy but the latter much the less of the two Of the 7 cases described here 5 recovered whereas Cooke[1] reported 1 recovery out of 14 cases The prognosis in pneumococcal meningitis appears to depend largely on the type of infecting organism Of Cooke's cases 4 were infected by the very virulent type III organism, whereas in my series 6 were found to be infected by type I the other was not typed It has already been noted that the first specimen of lumbar CSF often shows no abnormality and that when this happens it is desirable to do a cisternal puncture immediately, otherwise dangerous delay in diagnosis may result But though the first specimen of lumbar CSF may be normal in total protein and cell-count the enumeration of the whole content of a Fuchs-Rosenthal chamber may reveal one or two polynuclear cells Every apparently normal specimen is examined carefully for polynuclears and the discovery of even a single cell of this type appears to justify investigation of the cisternal fluid

During a recent epidemic of meningococcal meningitis I found that such cases responded more favourably when soluseptasine, intravenously and sulphapyridine by mouth or intramuscularly were combined than when either was given alone Because of this apparently synergistic effect the same combination of chemotherapy was applied to cases of pneumococcal meningitis Antiserum and chemotherapy were used in 6 cases of the 7 Where the direct film showed morphologically typical pneumococci and when the type of the organism was not known (as when cultures were sterile) types I and II polyvalent antiserum was given on the assumption that the cases were probably caused by the more prevalent types found in this area The antiserum was given intrathecally and in 5 cases injected into the cisterna magna so that its maximum concentration was as near to the seat of disease as possible As pneumococcal meningitis tends to localise around the base of the brain it is reasonable to suppose that cisternal puncture will of itself help to prevent excessive accumulation of exudate around the foramina of Luschka

The temperature in the recovered cases fell to normal within 24–48 hours whereas it remained high in the fatal cases No clinical complications or sequelæ due to the disease or treatment were found on discharge from hospital During treatment investigation of urine for protein and blood by the usual hospital chemical tests were consistently negative Because of severe cyanosis in case 6 a full blood examination was carried out

SUMMARY

A series of 7 cases of pneumococcal meningitis admitted to hospital over a period of 7 months are

---

[1] Cooke, W T *Lancet*, 1941 ii 510

described 5 recovered fully. The ages range from 5 to 42 years

They were treated by intracisternal antiserum of the appropriate pneumococcal type, with soluseptasine intravenously and sulphapyridine by mouth or intramuscularly The average dosage given to a typical case was about 120,000 units of serum intracisternally over the first 4 days, combined with approximately 58 g of sulphapyridine by mouth and 140 c cm of a 10% solution of soluseptasine given intravenously, over 7 days

If type antiserum is to be used, speedy diagnosis from examination of the CSF is essential In 3 cases the first specimen of lumbar-puncture CSF was negative on cytological, chemical and bacteriological examination, whereas the cisternal fluid was positive and revealed the causative organism Though the first specimen of lumbar CSF may be normal in total protein and cell-count, enumeration of the whole content of a Fuchs-Rosenthal chamber may reveal one or two polynuclear cells and the discovery of even a single cell of this type appears to justify investigation of the cisternal fluid

I wish to thank Dr G W Murray, medical officer of health for Blackpool, for permission to publish these cases, and Dr W B Davis, pathologist to the Victoria Hospital, Blackpool, for his advice and for undertaking the necessary laboratory examinations

Medical Societies

ASSOCIATION OF CLINICAL PATHOLOGISTS

ABOUT 60 members and guests attended a meeting of this association at Oxford on Jan 2 The morning was given up to demonstrations and the afternoon to a discussion of the future of clinical pathology

Dr J N CUMINGS described chemical changes in the blood after head injuries Among 39 patients with different degrees of trauma, one showed a rise in blood-urea to over 400 mg per 100 c cm and another to 172 mg while 5 healthy young subjects showed only a slight increase—to between 43 and 60 mg A rise in plasma inorganic phosphate occurred in those more severely injured, the highest figure obtained being 7 6 mg per 100 c cm The kidney from one of the cases of uræmia showed red blood-cells and blood pigment in a number of the tubules and pigment in some of the epithelial cells of the tubules suggestive of blood pigment Glomeruli, vessels and stroma appeared to be normal

Dr CUTHBERT DUKES said that the only gram-negative bacilli commonly found in urine which will strongly ferment urea are strains of proteus During the past seven years he has tested many hundreds of cultures of proteus and the test has been valid Nutrient broth containing 1% urea is inoculated with the suspected culture overnight When next morning a few drops of 25% sulphuric acid are added the ammonium carbonate produced by the splitting of the urea is decomposed and brisk bubbling occurs The test has proved of value also for identifying staphylococci present in calculous disease of the urinary tract If they give a positive reaction in the urea broth they are liable, if persisting despite medical treatment, to favour the formation of further phosphatic calculi Diphtheroids and some staphylococci of no pathological importance may cause a slight degree of bubbling but this is rare

Dr ANNE GIBSON showed a number of sputum films containing malignant cells, stained by Dudgeon and Wrigley's method

Miss FELICITY HOBSON demonstrated the technique of estimating prothrombin with Russell viper venom and lecithin The patient's blood is withdrawn rapidly and with as little trauma as possible, oxalated immediately and spun, the plasma being thereafter kept in the refrigerator Into a clean small test-tube, kept at 37° C in a water-bath, are put 0 1 c cm of plasma and 0 1 c cm of a venom solution which has been diluted so as to give a normal prothrombin time of 10 seconds In a few seconds 0 1 c cm of warm M/40 calcium chloride is added The test-tube is held on the slant and rotated slowly, the onset of clotting being read by stopwatch

Dr R G MACFARLANE made membranes of human fibrin which may be applied to burns or scalds by means of plasma allowed to clot beneath the film, these membranes form a physiological occlusive dressing In favourable cases the membrane dries into a firm translucent scab and epithelialisation takes place below it To make the membranes, citrated plasma is clotted with calcium chloride and Russell viper venom in a level dish The membranes can be sterilised by heat and may be kept for months if frozen solid He also showed sternal puncture films from fatal cases of pernicious anæmia carcinomatosis and agranulocytosis due to sulphonamide therapy, perhaps the most striking was from a child of 12 years suffering from stomatitis and with the blood picture of agranulocytosis Marrow films showed maturation arrest but no agranulocytic aplasia Treatment with liver, nicotinic acid and 'Marmite' was followed by recovery Pentnucleotide would probably have been useless

Dr A H T ROBB-SMITH demonstrated slides of sputum from cases of fat-embolism These films were made at least 36 hours after the onset of pulmonary symptoms and contained extravascular granules 10–40μ in diameter, the number increasing in serial daily films for some days The sputum film is stained with Sudan IV solution and counterstained with hæmatoxylin, differentiated with acid alcohol if necessary, and mounted in glycerin jelly

Dr F B SMITH produced examples of paraganglioma and miliary tubercles in the bone-marrow, and Colonel C J HARWOOD LITTLE showed films of *Plasmodium ovale* from West Africa

Dr D N NABARRO described alarming and almost fatal anaphylaxis within half an hour of the intradermal injection of 0 05 c cm of mixed antigen into an asthmatic patient with a bad family history Many doses of adrenaline with oxygen inhalation were necessary to save the patient

Dr O C LLOYD showed 40 preparations of endometrium illustrating the different types of epithelial cellular vacuolation found in the different secretory phases (including pregnancy), the association of hypertrophic endometrium with fibroids and polyp formation as well as hyper-œstrinisation, some of the conditions found in cases of "sterility", and some pitfalls in the diagnosis of polymorphic sarcoma and chorion epithelioma

Visitors were shown over the regional transfusion laboratory by Dr A G Sanders

EX-SERVICES WELFARE SOCIETY

THE first conference of this society for two years, and the first ever held in Scotland, took place in Edinburgh on March 6, its subject being

The Aftercare of Neurotic War Casualties

Prof CHARLES MCNEIL, the chairman, said how impressed he was by the scope of the society's work—it helps all members of the fighting forces and of the women's auxiliary services, and in cases of nervous and mental disorder interests itself in treatment in the acute stages, convalescence, follow-up, provision of suitable employment and assistance regarding pensions

Prof D K HENDERSON, discussing war-time neurosis and psychosis stressed their importance both now and in the future and the necessity for making plans now The problem of the readjustment of those incapacitated by war service was wider than a purely medical one—it was a medico-social one Much had been and was being done to avoid wastage It was recognised in the last war that people suffering from certain nervous and mental illnesses should not be allowed to undertake military service Then psychiatrists played a small part Now psychiatrists could and did help very largely in the work of *medical boards* and in preventive work Three aspects came particularly before them—discharge, pensions and rehabilitation Discharge had a positive aspect, the discharge of a person from hospital back to his unit, and a negative aspect, discharge from service altogether Nervous breakdowns in war occurred at a more superficial level than in peace and were more susceptible to readjustment They were dealing essentially with young people whose general adaptability was good They must try to conserve as many men as possible must deal with them quickly and must avoid too much hospitalisation At present 9 months was allowed for the treatment of psychotics and this was adequate, for if they were not relieved in that time they required treatment in civil hospitals. A similar time-limit was desirable for psychoneurotics to avoid excessive hospitalisation. He would like to see the "boarding-out" hospital avoided and since entrance to the forces was controlled by civilian doctors civilians should also sit on discharge boards. The pensions problem was very difficult—to decide whether service caused or aggravated an illness. He had every sympathy with the man with an abnormal constitution who gave good service for two years or so and then broke down and such men should be sympathetically treated by the pensions authorities. Rehabilitation was of first importance and required consideration of types of work and the kind and amount of supervision. There was the necessity for training centres and for a variety of occupations to suit a variety of persons as well as for highly trained personnel.

Major C E THWAITES medical director of the society, reviewed its history and functions. They had homes for treatment and specialised treatment was given in hospitals and nursing-homes. They could help ex-Service men financially in cases of need. Men in mental hospitals all over England were visited and helped with advice money and so on and he hoped this would shortly be extended to Scotland. They helped men who were in trouble with the police and delinquents were often bound over by the courts to the society. At the Industrial Colony at Leatherhead they taught men occupations, paid them so that they were self-supporting and provided married quarters. This he considered to be the society's most important work.

Surgeon Captain DESMOND CURRAN described some of the methods which the Navy was using to handle cases of psychosis and psychoneurosis.

Colonel J. R. REES said there had not been any fixed period for the treatment of psychoneurotics. There had not been many cases of pure war neurosis; most had been aggravations of prewar neurosis. The Army had been trying to treat the aggravation and restore the men to their prewar state before discharge. After that they could be taken over by the Ministry of Pensions and treated by the EMS. The "discharge" atmosphere in hospitals was being combated and in some EMS hospitals military training was provided as a form of occupational therapy, this gave more men in better condition back to the Army. A "misfit" scheme had been introduced to arrange for the transfer of men who had broken down to more suitable occupations and they had had successful results in 73%. There was as yet no large body of people with extensive experience of rehabilitation. He pleaded for a national rehabilitation scheme properly organised and permitting the scientific study of the problem.

Colonel JOHN CUNNINGHAM, of the Astley-Ainslie Institution said that those in general hospitals were faced with different problems in service patients than in civil patients. Civilians had an incentive to get well and back to work, whereas service patients were paid while in hospital and often lacked incentive to get well. He stressed the necessity for cutting down hospitalisation and for the early introduction of occupational therapy during a man's illness. A special follow-up and vocational service was needed with close liaison between medical and social officers. This was lacking in the Ministry of Labour's scheme.

Dr. J H MACDONALD remarked on the lower incidence of psychoneurosis in this war and suggested that one reason might be the knowledge that the Ministry of Pensions was not so sympathetic now as in and after the last war. He thought many cases in the last war were wrongly diagnosed. Assessment must be made by men fully trained in psychiatric work.

Major T F RODGER suggested that the Ministry of Labour should place discharged men straight into jobs. If they were supervised there it would provide one channel of rehabilitation. Civilian boards did not always pass the correct men for the Army. Discharge was therefore part of the selection process. The selection should be done by doctors who had knowledge of Army conditions and requirements.

Dr D R MACCALMAN said that the civilian boards were beginning to recognise cases at the entrance examinations and to refer doubtful ones to the consultants provided. The Services could do much to increase the power of adaptation. Those who broke down had a very poor knowledge of the causes and aims of the war. Morale could be improved by education along these lines and enthusiasm raised. Cromwell's Ironsides had been the finest body of soldiers ever produced because they had an intense enthusiasm for the ideal for which they fought.

Dr J BOYD JAMESON chairman of a selection board stressed the great difficulty boards had in assessing mental condition while working under great pressure. At the beginning of the war they were passing men through at the rate of 28–30 each 24 hours. He refuted Dr MacCalman's statement that boards were only now beginning to recognise the psychotic and psychoneurotic cases.

Dr WILLIAM HAIG urged the necessity for allowing enough time for a civilian to readjust himself on entrance to the forces in view of the completeness of the change.

Colonel THOMAS TENNENT reminded the conference that large psychiatric problems arose in the women's Services. Those who were recruiting women had not apparently gained much from the experience with the men. It was surprising how many psychopaths were admitted some of them having recently been inpatients in mental hospitals.

General J A MANIFOLD thought the selection boards had done very well. Mistakes had not been commoner than before the war when the boards were composed of Army doctors trained in the requirements of the Army. Boards could not be asked to assess mental states in the short time at their disposal but all discharge boards had the services of a psychiatrist. He described the success of the scheme for the allocation of the slow-witted lonely type of manual labourer to the Pioneer Corps and also the various educational schemes in the Army.

Dr J C MCKENZIE said that all such men who were discharged whether pensioned or not, received treatment from the EMS after discharge. The emphasis now was on treatment and rehabilitation and on the placing of men in industry.

Dr W M HARROWES said that the medical branches of the Services should be concerned with providing them and keeping them provided with fit men. This opportunity should be used for a mass scrutiny of the population. The hard core of unemployment before the war was said to be composed of feeble-minded persons. Society now knew it had been harbouring this core of undisclosed psychoneurotics and psychotics. Since the whole question was one of the relation between the individual and society the problem was a national one.

* * *

A luncheon was held after the conference in honour of Sir Reginald Tyrwhitt president of the society. Mr WILLIAM Y DARLING lord provost of Edinburgh, was in the chair. In replying to the toast of his health Sir REGINALD said that the state was maintaining 6000 ex-Service men in mental hospitals and this work was supplemented by the private and voluntary work of the society. Since the last war it had helped 27 000 men and women with medical legal and other advice and financially. Its activities were world-wide. Its 70 000 subscribers had contributed not less than £40 000 a year in the last few years. The industrial side of the society's activities was large. The industrial centre produced the 'Thermega' electrical heating appliances and was a self-supporting concern in which all the workers made at least 55*s* a week. They could expand their work and employ more men if the Ministry of Supply would release more materials.

The NATIONAL ARP COÖRDINATING COMMITTEE have prepared a memorandum based partly on the experience of members who have visited all the more important bombed areas immediately after they have been raided and partly on information from such organisations as the National Council of Social Service and the Friends Ambulance Unit which have been actively working in the ARP services. The memo thus represents our accumulated experience of blitzes and gives first-class advice on dealing with the problems which they raise, from the staffing of information centres to plans for the feeding and rehousing of homeless people. Copies of the memo (6*d* plus postage) may be had from 30, Bedford Row, London, W C 1

Reviews of Books

Care of the Aged (Geriatrics)

(3rd ed) MALFORD W THEWLIS, M D London Henry Kimpton Pp 579 *30s*

DISEASE in children is probably sufficiently different in nature, incidence and manifestations from disease in adults to justify its study as a specialty , yet there were some who deplored the amputation of pædiatrics from the body of medicine Now comes " geriatrics," asking for special attention to the behaviour of disease in the aged Sir Humphry Rolleston, in his Linacre lecture on the subject in 1922, was both scholarly and practical, calling his remarks "Medical Aspects of Old Age"[1], and his was a useful contribution to the lore of general medicine Dr Thewlis is trying to work up geriatrics into a specialty Here, as in America, the elderly and the aged are becoming more numerous in the population, and they are not always treated with the sympathy and the understanding they deserve Our ignorance of the causes and mechanism of the biological process of ageing is immense By all means let these things be studied more diligently, but by physicians who keep the whole span of life within their perspective, not by geriatricians writing above their consulting-room doors " no admittance under sixty " Dr Thewlis protests against the neglect of the aged, and supports this by a list of the achievements of great men over sixty, purporting to show the " value of old age " Imposing as it is, this is no more than a list of exceptions The basis for care of the aged is the principle, to which medicine has long been committed, of respect for individual life—a principle inherent in the democratic outlook, irrelevant in the totalitarian In industry, commerce and the professions a man is usually expected to work hard until he reaches a certain age or stage, and then to retire to idleness The ill effects on his health and mental outlook are well known, and we should gain immensely if we could adapt the demand of society to cover the years of each man's capacity Dr Thewlis however does not follow his theme into the economic sphere, but develops his book into a textbook of medicine, surgery, therapeutics and nursing in their bearing on disease in the aged It breathes an air of enthusiasm, which sometimes leads to rather loose statements (" a pulse of 60 due to dilatation of the aorta "), but it offers plenty of good clinical observation and anecdote, and simple sensible therapeutic advice

Administrative Medicine

Editor HAVEN EMERSON, M D , professor emeritus in residence, Delamar Institute of Public Health, Columbia University, New York New York Thomas Nelson and Sons Pp 839

THE term " administrative medicine " as used in the title of this book covers those functions of communities which help the medical profession to guard and restore the health of the people , it excludes much of the older state medicine (general sanitation, for example, in which the medical profession has but an indirect interest) and includes all preventive medicine in which physicians require external help Over here administrative medicine is at present fluid and ill-defined , for the medicine of the future much must be planned which does not lie exclusively within the province of medical practitioners The value of this American work is enhanced rather than diminished by its national character, for it reviews the growth of a system which, with a common aim and within a similar form of government to our own, differs in its history and in local laws and customs The book consists of 53 articles on various subjects—from international voluntary health organisations to diabetes—written by various authorities most of whom are known to this country for their contributions to public medicine The loose-leaf arrangement allows any article to be replaced by another more recent one, but the binding will not admit any additions which would increase its size , thus the book can be kept up to date without becoming ponderous with obsolete matter It would be agreeable if all textbooks accepted this principle

The most contentious matter discussed in it is that of hospital provision The aim is the same in America as in Britain to offer every citizen requiring institutional treatment all that medicine can give, according to his needs and apart from any other consideration With us the hospital system is based on the voluntary general hospital founded as a charity to the poor apart from the Poor Law , hospitals for paying patients are an innovation In the United States the foundation was the private hospital founded for the benefit of the medical profession Both countries are aiming at making the supply of hospitals a community function, so that the experience of each is of great value to the other It is impossible for medicine to develop, or even to exist, without the help of the state, but the help should not interfere in strictly professional matters We do not want the state to tell us how we shall practise, but we do look to it to provide facilities for practising We cannot expect this amount of consideration unless we are willing to guarantee that what we ask is for the public benefit , we must therefore be ready to submit to public inquiry into what we can give In administrative medicine we act as advisors and directors , it is for the public to decide what facilities we shall be granted America is ahead of us in some ways and in others behind, but in every case we have something to learn from this book

The Parents' Problem

or How To Tell Children About Sex R MACDONALD LADELL, M B Leeds London The Psychologist Pp 48 *1s*

THE advice in this book could be summed up as " Clear your mind of cant, answer your children's questions truthfully, and don't get embarrassed " Dogmatism and undue simplification are the vices of these popular manuals thus Dr Ladell says firmly " all schools should be co-educational " , and " naturally a mental attitude which regards this natural function (menstruation) with repugnance results in irregular and colicky periods " He attributes to defective information about sex more misery and maladjustment than is justifiable, but his counsels are in the main sensible , occasionally he seems over-confident, as in the explanation of coitus which he suggests for a child of 11 or 12

Change of Life

(revised edition) Dame MARY SCHARLIEB, D B E , M D , M S Lond London Faber and Faber Pp 94 *3s*

THIS is a period piece and conjures up a vision of horsehair furniture and antimacassars , as such it is of interest Moreover it is the work of a historic figure in medicine, an acute observer and sound physician in her day To modern ears much of her advice on the management of menopausal patients will sound priggish and it reads rather like the stage directions of a Victorian play thus those in search of a stimulant are reminded that they will find a safe and wholesome one in a cupful of hot water, and there is a detailed description of how to take a sitz bath with a blanket draped round the shoulders This little book undoubtedly contains much good advice but it is unlikely to satisfy the intellectual needs of modern menopausal woman

Shock Treatment in Psychiatry

LUCIE JESSNER, M D , V GERARD RYAN, M D New *York Grune and Stratton Pp* 149

THE literature of this subject is now so swollen—by " several thousand titles," according to Dr Jessner and Dr Ryan—that a concise manual, adequately reviewing what has been written and describing modern procedure, is welcome The success of the authors in their difficult task has been considerable, and even those well versed in shock treatment will find it a convenient and reliable book of reference Insulin therapy is dealt with under the heads clinical symptoms of hypoglycæmia , technique , complications , changes during treatment , and assessment of value A similar division is used in the other half of the book, in which treatment by convulsions is presented The authors have intentionally omitted other drastic physical procedures such as production of aseptic meningitis, freezing, artificial fever, prolonged sleep, and carbon dioxide inhalation it may be concluded that they thought the chamber of beneficent horrors could be overfilled

---

[1] London Macmillan and Co

THE LANCET

LONDON: SATURDAY, MARCH 21, 1942

NATIONAL LOAF

REASON has prevailed and the nation's staple food is to be good nutritious stuff. Lord WOOLTON announced in the House of Lords on March 11 that from April 6 the only bread on sale will be national wheatmeal or authorised specialty brown. "I am satisfied," he said, "that we shall get a good bread, good in substance, good in texture, and agreeable to the palate. Unlike the standard bread of the last war it will be a pure bread." A week before,[1] Major LLOYD GEORGE had explained that an 85% extraction flour would save shipping space and give us a loaf with nutritive advantages, but would reduce the supply of animal feeding-stuffs and thus lose us a certain amount of milk, meat or eggs, and give us a type of bread which was "not what the people of this country prefer"; only the Government were in a position to know, he said, at what moment the balance tipped down on the side of 85% extraction. The increasing calls on our shipping space arising from the extension of the war to the Far East have now tipped the scale. Lord HORDER, looking at the new policy (as he put it) from the doctor's angle, spoke of wheatmeal as a natural food and therefore superior to white flour. He was willing to leave to further investigation the actual availability during digestion of this superior content. The work of KREBS and MELLANBY, published in our last issue, would have strengthened his position. The digestibility of national wheatmeal is 94% dry matter and 89% nitrogen, being not significantly less than that of white flour. Man is in fact very well able to utilise the husks without the help of the bovine middle-man. And the husks are undoubtedly rich in the whole of the vitamin-B complex and especially valuable as a source of nicotinic acid. It only remains to safeguard the loaf by eliminating what Lord HORDER called the criminal tinker, with the help of the "more detailed technical specification" for wheatmeal which the Minister of Food has been advised that it is now possible to frame.

WEEDING OUT TUBERCLE

THE X-ray survey of the chest is slowly but surely infiltrating the industrial front. Pulmonary tuberculosis occurs in factory workers, but apart from its association with silicosis and asbestosis there is little justification for regarding it as an industrial disease in the same category as (say) anthrax or lead poisoning which arise directly from contact during working hours with infected material or poisonous substances. Obviously it is possible for tubercle bacilli to be transferred in a factory from one worker to another, but when cases of tuberculosis in factories are investigated the evidence usually suggests that infection occurred at home, or maybe in a place of amusement, and not in the factory workroom which is as a rule well ventilated. Contact in the factory is rarely intimate enough to give rise to direct infection, though BRIDGE[2] records an instance where skilled glass-blowers, some of whom had open tuberculosis, used the same blow-pipes as their young pupils. In normal times it seems reasonable to assume that the incidence of pulmonary tuberculosis in industry will be similar to that in comparable economic groups of the general population. The increased incidence of war-time is the resultant of many factors, including housing conditions, movements of population, deficient or altered diets, together with physical, nervous and emotional over-strain. Mass surveys of factory workers do not presume that tuberculosis is an industrial disease, but that the factory population is conveniently grouped for investigation.

In a recent issue (Feb. 7, p. 161) Dr. A. S. HALL gave an account of his survey by mass radioscopy of the workers in two modern factories employing both men and women. In the first 60% and in the second 97% of the workers attended for examination. Of 575 people examined in the first factory 3 were found to be tuberculous, and of 795 in the second 2 were known to have phthisis and 2 others were found to have active disease. In each factory therefore about 0.5% of the workers had clinically significant tuberculosis. This percentage is lower than that found in similar mass surveys elsewhere, a common figure being between 1 and 2%. The question therefore arises whether the examiner sees as much and as truly on the fluorescent screen as on the developed film. HALL states that in his previous experience the film had rarely revealed anything missed on the screen, whereas movements of the patient behind the screen had often enabled him to detect shadows not shown on the film. GARLAND[3] in America regards radioscopy as reasonably accurate, provided that the examiner's eyes are adequately accommodated to the dark (and this is a process that cannot be hurried) and that he is experienced at interpreting what he sees; but he quotes the work of a distinguished Danish radiologist[4] who found by careful photometric tests that the reduced illumination in radioscopy diminishes the capacity of the eye to distinguish both contrast and form even when full advantage is taken of dark-adaptation. The detail is on the fluorescent screen but the contrast is too weak to be appreciated by the retina. Herein lies the advantage of the camera, whose aperture may be a hundredfold greater than that of the pupil. A degree of brightness adequate for naked-eye diagnosis would require a disproportionate increase of current. GARLAND in fact agrees with the majority of investigators that radioscopy cannot properly be used for the mass detection of early tuberculous lesions. It is to be regarded as an adjunct to radiography, particularly in giving a clue to the best position of the screen in relation to the patient in order to interpret an ambiguous shadow. And used thus it does not carry the risk to the operator inherent in mass radioscopy, which, GARLAND mildly remarks, "may expose the physician to hazardous amounts of scattered radiation," and has been bluntly described by a correspondent as "a very dangerous proceeding which should be prohibited." Expectant X-ray martyrs have been warned that no glamour will attend their sufferings.

---

[1] See *Lancet*, March 14, p. 338.

[2] Bridge, J. C. Ann. Rep. Chief Insp. Fact. 1935, p. 43.

[3] Garland, L. H. *Amer. Rev. Tuberc.* 1942, 45, 1.

[4] Licht, E. de F. *Acta radiol., Stockh.* 1936, 17, 105.

Having now admitted the photograph, whether radiogram or fluorogram, as the robot of mass investigation we need not inquire further here into the choice of apparatus as that has been dealt with in a recent leading article (March 7, p 207) but it is pertinent to inquire whether in a world at war such investigation is precluded by the cost or by the shortage of suitable apparatus An elaborate study has been published[5] of the cost of 29 surveys (24,136 individuals) made by the health department of New York City during the first half of 1940 All items were faithfully assessed—professional and clerical work, materials, rentals, depreciation of equipment—and the cost worked out at $1 75 for each person examined, and $146 55 for each clinically significant case discovered in the survey Full-size rapid paper films were used, cut from a roll and costing $0 75–1 00 each, and it is generally agreed that small fluorograms would work out far cheaper, no more than about a penny each On the question of the availability now in this country of apparatus suitable for mass radiography we have the recent statement[6] of the National Association for the Prevention of Tuberculosis "There is reason to believe that the X-ray manufacturers will shortly be ready to provide apparatus as soon as they receive orders" It may well take 3–6 months to build up a four-valve transformer but in the meantime there are second-hand sets available and an open field for ingenious improvisation Makers can supply cameras and certainly some could be had on loan The shortage in rotating anode tubes and grids is being made good from America Anyone who puts his mind seriously to it should be able to get what he wants within 3 months The successful radiographer of the future will, to misquote Sir ALMROTH WRIGHT, be an improvisor But in this welter of instrumental aid when employers and employees alike have been led to expect surveys which will "wipe out tuberculosis" it may be well to add a cautionary word No diagnosis is ever made on a fluorogram, any doubtful or abnormal finding calls first for a full size radiogram and, should the abnormality be confirmed, a thorough physical overhaul If the whole method is not to be discredited, and if hardships and misery from faulty diagnoses are to be eliminated, as much thought must be given to the training of personnel as to the choice of apparatus

And still one thing remains to be said Any survey made in a factory must obviously have the full consent of management and workpeople Investigations should be arranged to interfere as little as possible with production which at the present time is of paramount importance Radiological lesions discovered in industry would not necessarily mean sanatorium treatment, although change of environment would be desirable for the great majority Holidays with pay might do a lot to popularise preventive treatment Most of the medical students with purely radiological lesions in the UCH survey continued their work, but with some restriction of exercise and avoidance of late hours The most difficult problem is presented by the bacilliferous symptom free patient If a worker submits voluntarily to examination he will naturally ask that he and his family are not to suffer financially while undergoing treatment for what, in his opinion might have healed at work Tuberculosis is coming to be regarded more and more as a disease of economics, good food and freedom from worry about dependants are essential concomitants of cure Recent correspondence[7] has shown how present this is to the minds of medical men who are in the thick of it "The real problem is to avoid victimisation of the worker a Government subsidy during the period of the patient's indisposition is an inevitable corollary to large-scale mass radiography" And this problem must and can be solved It has already been a matter of conference between the Trades Union Congress and the NAPT, and it should be the first thought of the movement which is bringing together for common action the three great tuberculosis organisations

THE CLINICIAN AND THE MEGALOBLAST

ONE of the earliest observations in hæmatology was EHRLICH'S detection, sometimes in the blood, always in the bone-marrow of cases of pernicious anæmia, of a large hæmoglobinated cell with an open network nuclear pattern which he called the megaloblast NAEGELI and FERRATA, studying post-mortem bone marrow, showed that EHRLICH'S megaloblast was one of a series of cells whose earliest stage was a large basophilic cell (pro megaloblast) that matured by developing hæmoglobin in the cytoplasm, and whose nuclear pattern first became more spaced but eventually collapsed These megaloblasts were a parallel series to the normoblasts—the erythroblasts of normal adult marrow—and both series seemed to have a common basophilic progenitor NAEGELI pointed out that hyperplastic marrow occurred in other anæmias besides pernicious anæmia, but then megaloblasts were never found Embryological studies suggested that the megaloblasts represented a primitive form of erythropoiesis and were replaced at an early stage by the normoblasts, thus pernicious anæmia was regarded as a return to embryonic erythropoiesis All this, though interesting, gave little help to the clinician battling with problems of diagnosis and treatment the only positive point was that characteristic megaloblasts seen in blood films strongly supported the diagnosis of pernicious anæmia

This early work seems to have got lost in the fog of 1914–18, and outside the Continent forgotten, for when the name megaloblast next aroused interest in the Anglo American medical world it had become attached to quite a different cell[1] In 1921 SABIN applied the name to basophilic blood-cells in the developing chick, and in 1925 DOAN, CUNNINGHAM and SABIN, studying mammalian and avian blood formation, applied it to the first few generations of erythroblasts developing from endothelium in both embryo and adult, this megaloblast corresponds to the basophilic common progenitor of the pre 1914 workers In 1926 liver treatment for pernicious anæmia was introduced, and in 1927 PEABODY,[2] by examining the tibial bone marrow during life, was able to report that the effect of liver was to change a marrow packed with primitive basophilic cells to a less cellular marrow containing numerous hæmoglobinated normoblasts He thought that the primiive basophilic cells were the megaloblasts of SABIN, and inferred that megaloblasts mature into normoblasts which in turn mature into red blood-cells and that the liver factor is necessary for the maturation of megaloblasts into normoblasts Now unusual calls on blood-forming tissues are met not only by hyperplasia, but also by the appearance of more primitive types of cells, a heavy call on the erythropoietic tissues, whether in pernicious anæmia or other conditions, might thus be expected to cause the appearance of megaloblasts in the bone-marrow, and the methods of marrow biopsy then in use duly confirmed this view This work had immediate clinical applications Bone-marrow biopsy was then unusual but it was known that a high colour-index and increased size of red cells were associated with pernicious anæmia and thus with megaloblastic marrow consequently these signs were widely regarded as an indication for liver treatment But it soon became clear that though the expected response from liver treatment occurred in true pernicious anæmia, in other hyperchromic megalocytic anæmias it was at best irregular, if not entirely absent

---

[5] Milbank Mem Fd quart Bull 1941 19 402

[6] Leaflet entitled The Association's Policy dated Jan 19 1942 See Lancet, Feb 21, p 248

[7] See Lancet Feb 21, p 242, March 7 p 306

The paradox has been solved by the results of the work on bone-marrow biopsy by sternal puncture, which, introduced by ARINKIN in 1929, was widely taken up some years later Sternal marrow puncture has proved, in the hands of workers all over the world, the greatest aid to the diagnosis of blood diseases since the introduction of Romanowsky stains over 40 years ago—it is easy to perform, the preparations require no more skill than is needed to make a first-class blood film, and it obviates the snag of post mortem autolysis which as JEANNERET[2] pointed out causes serious distortion within 3 hours of death The method has its limitations but when these are understood certain broad inferences have emerged Using this technique NORDENSON[3] and SEGERDAHL[4] in Sweden, DAMESHEK and VALENTINE[5] in America SCHULTEN[6] in Germany, STORTI[7] in Italy, ISRAELS[8] and BODLEY SCOTT[9] in this country, and others have all reached conclusions that vindicate in a remarkable manner the work of the pre 1914 hæmatologists Allowing for variation in nomenclature, they all agree that there are two non-interchangeable series of erythroblasts—the normoblasts and the megaloblasts—derived from a common basophil stem-cell (pro erythroblast), in each series three stages can be distinguished an early basophilic, an intermediate polychromatic and a final eosinophilic Since the series merge at the primitive end, and since at the final stage collapse of the nucleus occurs, it is sometimes not easy to place individual cells, nevertheless these workers have been able to make differential counts of the marrow cells indicating to a fair approximation the relative proportions of these seven types of erythroblasts The different marrow pictures thus distinguished have been found to correspond to different clinical types, and, as ISRAËLS[10] has explained, it is now possible to base a reasonable classification of the anæmias on this correlation of marrow changes and clinical types The classification of the 1920 s went awry because the technique caused confusion between pro-erythroblasts and early normoblasts and megaloblasts, and it is now being replaced in the textbooks by more modern ideas

The revivified megaloblast has a definite message for the clinician A marrow report showing megaloblastic hyperplasia is a sign that liver treatment should be given and that a good response may be expected in the majority of patients Absence of megaloblasts is just as informative, for liver is then useless, and this is true even in the face of suggestive changes in the shape and size of the red cell[11] To this statement there is one important exception When intramuscular liver extract is given to a pernicious anæmia patient the marrow picture changes from megaloblastic to mixed megaloblastic and normoblastic in a few hours, and by the time the reticulocyte peak occurs in the blood no more than an occasional megaloblast may be left, hence the importance of avoiding treatment before examining the marrow This change has recently been reported on by DAVIDSON, DAVIS and INNES[12] They confirmed the rapidity of the changes, but regard as impracticable the classification of erythroblasts adopted by the workers cited above Instead they propose a classification by types based on criteria of maturity, type I being the least mature and type IV the most so that the marrow of a patient with pernicious anæmia before liver treatment has a majority of types I and II and after treatment mostly types II, III and IV These types cut across the megaloblast-normoblast distinction so that the classification resembles that of the 1920 period, and DAVIDSON and his colleagues press the comparison closer by reasserting that under conditions of prolonged and severe strain a reversion of the normoblastic towards the megaloblastic blood picture may occur' The clinician may well ask how this controversy affects him It does affect him because the 1940-model megaloblasts give specific information about treatment and diagnosis the 1920 model and DAVIDSON'S types do not Perhaps distinction of seven kinds of erythroblasts is not necessary, perhaps it is sufficient to say whether a marrow is predominantly megaloblastic, normoblastic or mixed The clinician can get what he wants from such a statement though he will be missing useful information, but if he cannot make that distinction he is at sea, back where he was in 1920 But there is no cause for alarm, the propositions of DAVIDSON and his co-workers are based on negative evidence—on what they cannot do—whereas the evidence for an informative megaloblast is based on positive findings which have been agreed on by workers in several countries over many years Future researches will probably make the 1940 model megaloblasts give way to more precise information about red blood-cell formation Until that day arrives the wise clinician who wants successfully to diagnose and treat the less obvious cases of anæmia he meets with will stick to the 1940 model and its clinical implications The clinician must however make sure that his pathologist understands what he wants or failing that he might do worse than study the films himself

---

1 Peabody F W *Amer J Path* 1927 3, 179 —2 Jeanneret H *Schweiz med Wschr* 1940, 70 351 —3 Nordenson N G Studies on bone marrow from sternal puncture, Stockholm, 1935 —4 Segerdahl E *Acta med scand* 1935 suppl 64 1 —5 Dameshek W and Valentine E H *Arch Path* 1937 23 159 —6 Schulten H Die Sternalpunktion als diagnostiche Methode Leipzig 1937 —7 Storti E *Hæmatologica* 1937 18 1 —8 Israëls M C G *J Path Bact* 1939 49 231 —9 Scott R B *Quart J Med* 1939 8 127 —10 *Lancet* 1941 ii 207 —11 See *Lancet* March 14 1942 p 325 —12 Davidson L S P Davis, L J and Innes J *Quart J Med* 1942 11, 19

Having now admitted the photograph, whether radiogram or fluorogram, as the robot of mass investigation we need not inquire further here into the choice of apparatus as that has been dealt with in a recent leading article (March 7 p 207) but it is pertinent to inquire whether in a world at war such investigation is precluded by the cost or by the shortage of suitable apparatus An elaborate study has been published[5] of the cost of 29 surveys (24,136 individuals) made by the health department of New York City during the first half of 1940 All items were faithfully assessed—professional and clerical work, materials rentals depreciation of equipment—and the cost worked out at $1 75 for each person examined, and $146 55 for each clinically significant case discovered in the survey Full-size rapid paper films were used, cut from a roll and costing $0 75–1 00 each, and it is generally agreed that small fluorograms would work out far cheaper, no more than about a penny each On the question of the availability now in this country of apparatus suitable for mass radiography we have the recent statement[6] of the National Association for the Prevention of Tuberculosis "There is reason to believe that the X-ray manufacturers will shortly be ready to provide apparatus as soon as they receive orders It may well take 3–6 months to build up a four-valve transformer but in the meantime there are second-hand sets available and an open field for ingenious improvisation Makers can supply cameras and certainly some could be had on loan The shortage in rotating anode tubes and grids is being made good from America Anyone who puts his mind seriously to it should be able to get what he wants within 3 months The successful radiographer of the future will, to misquote Sir ALMROTH WRIGHT, be an improvisor But in this welter of instrumental aid when employers and employees alike have been led to expect surveys which will "wipe out tuberculosis" it may be well to add a cautionary word No diagnosis is ever made on a fluorogram, any doubtful or abnormal finding calls first for a full size radiogram and, should the abnormality be confirmed, a thorough physical overhaul If the whole method is not to be discredited and if hardships and misery from faulty diagnoses are to be eliminated, as much thought must be given to the training of personnel as to the choice of apparatus

And still one thing remains to be said Any survey made in a factory must obviously have the full consent of management and workpeople Investigations should be arranged to interfere as little as possible with production which at the present time is of paramount importance Radiological lesions discovered in industry would not necessarily mean sanatorium treatment although change of environment would be desirable for the great majority Holidays with pay might do a lot to popularise preventive treatment Most of the medical students with purely radiological lesions in the UCH survey continued their work, but with some restriction of exercise and avoidance of late hours The most difficult problem is presented by the bacilliferous symptom-free patient If a worker submits voluntarily to examination he will naturally ask that he and his family are not to suffer financially while undergoing treatment for what in his opinion might have healed at work Tuberculosis is coming to be regarded more and more as a disease of economics, good food and freedom from worry about dependants are essential concomitants of cure Recent correspondence[7] has shown how present this is to the minds of medical men who are in the thick of it "The real problem is to avoid victimisation of the worker a Government subsidy during the period of the patient's indisposition is an inevitable corollary to large-scale mass radiography" And this problem must and can be solved It has already been a matter of conference between the Trades Union Congress and the NAPT, and it should be the first thought of the movement which is bringing together for common action the three great tuberculosis organisations

THE CLINICIAN AND THE *MEGALOBLAST*

ONE of the earliest observations in hæmatology was EHRLICH'S detection sometimes in the blood, always in the bone-marrow of cases of pernicious anæmia of a large hæmoglobinated cell with an open network nuclear pattern which he called the megaloblast NAEGELI and FERRATA studying post mortem bone marrow, showed that EHRLICH'S megaloblast was one of a series of cells whose earliest stage was a large basophilic cell (pro-megaloblast) that matured by developing hæmoglobin in the cytoplasm and whose nuclear pattern first became more spaced but eventually collapsed These megaloblasts were a parallel series to the normoblasts—the erythroblasts of normal adult marrow—and both series seemed to have a common basophilic progenitor NAEGELI pointed out that hyperplastic marrow occurred in other anæmias besides pernicious anæmia, but then megaloblasts were never found Embryological studies suggested that the megaloblasts represented a primitive form of erythropoiesis and were replaced at an early stage by the normoblasts, thus pernicious anæmia was regarded as a return to embryonic erythropoiesis All this though interesting, gave little help to the clinician battling with problems of diagnosis and treatment, the only positive point was that characteristic megaloblasts seen in blood films strongly supported the diagnosis of pernicious anæmia

This early work seems to have got lost in the fog of 1914–18, and outside the Continent forgotten, for when the name megaloblast next aroused interest in the Anglo American medical world it had become attached to quite a different cell In 1921 SABIN applied the name to basophilic blood-cells in the developing chick, and in 1925 DOAN, CUNNINGHAM and SABIN studying mammalian and avian blood formation, applied it to the first few generations of erythroblasts developing from endothelium in both embryo and adult, this megaloblast corresponds to the basophilic common progenitor of the pre-1914 workers In 1926 liver treatment for pernicious anæmia was introduced and in 1927 PEABODY,[1] by examining the tibial bone-marrow during life was able to report that the effect of liver was to change a marrow packed with primitive basophilic cells to a less cellular marrow containing numerous hæmo complications 3 presented an abnormal tracing The abnormalities consisted of an absent Q_4 together with a positive T_4, a diphasic T_2 and a PR interval of 0 24 sec Such changes are not significant The electrocardiographic changes of cardiovascular syphilis develop late and are usually due to aortic regurgitation stenosis of the coronary orifices, or rarely to gumma or myocarditis Uncomplicated aortitis does not lead to electrocardiographic abnormality The development of the radiology of the heart and great vessels at first led to expectations that early aortitis might be detected by repeated careful examinations either by teleradiography or fluoroscopy They have hardly been fulfilled The main obstacle is the impossibility of obtaining a standard of normal measurement for the size of the aorta Several methods have been devised but all show that there is a wide variation in the size of the normal aorta In the Vaquez-Bordet[3] method the size is arrived at by measuring the distances from the midsternal line to the farthest point of the ascending aorta on the right and to the farthest point of the aortic knob on the left and adding the two together In 200 normal patients Boharas found that this figure ranged from 3 9 to 7 8 cm In 200 syphilitics 3% had unequivocal or diffuse enlargement of the aorta but this was between 18 and 20 years after infection The width of the root of the aorta in the left oblique position (Hampton's[4] method) shows a similar wide variation (4–7 4 cm) which makes it of little use in the diagnosis of early aortic dilatation For the same reason, Fray's[5] method of expressing the width of the aorta in terms of the chest width at the same level in the left oblique position is also unreliable Fluoroscopy may reveal increased aortic pulsation, local dilatation, increased density of the aortic wall or irregularity of its outline But none of these changes is pathognomonic of syphilis and they do not occur early Every reported abnormality of the syphilitic aorta detected radiologically has been observed in non syphilitic aortic disease Although saccular aneurysm is almost always due to syphilis it should be remembered that in rare instances it may be due to advanced arteriosclerosis Boharas and his colleagues conclude that a clinical diagnosis of early syphilitic aortitis is impossible and that radiological methods are valuable but limited

---

[5] Milbank Mem Fd quart Bull 1941 19 402

[6] Leaflet entitled 'The Association's Policy' dated Jan 19 1942 See Lancet, Feb 21, p 248

[7] See Lancet, Feb 21 p 242 March 7 p 306

BITE OF THE BLACK WIDOW

SPIDERS are the serpents of the insect world, nearly all possess poison glands which excrete a venom that is injurious to insects but only in a few species is it dangerous to man Members of the genus latrodectus are specially dangerous, and presumably because of their black attire these sinister insects are known as widow spiders In southern Europe *Latrodectus tredecimguttatus*, or the malmignatte, has been the subject of much ill-found imagery and folk-lore But the true "tarantula"—*Lycosa tarantula*—is also found in southern Europe and mysterious properties were ascribed to its bite in the Middle Ages, among them the production of the hysterical disease "tarantism" There are poisonous species of lactrodectus in New Zealand South Africa and Turkestan and the black widow, *L mactans*, is well known and much feared in California Black widows are indeed common throughout the United States and Canada and have been carefully studied by American workers, from whom most of our knowledge of their venom has been gleaned[6] It is said that some 5% of bites by the black widow are fatal Occasionally its bite gives rise to local gangrene and the formation of a dry black eschar It is not usually painful, but is followed by a dull numbing pain which eventually becomes localised in the muscles of the chest, back and abdomen This nerve pain is attributed to stimulation of the myoneural junctions The abdominal wall becomes rigid while respiration is impeded by spasm of the thoracic muscles In fatal cases death takes place within 18–36 hours The male black widow is 1–1 5 cm long and the female about five times as large The adult female is glossy-black with crimson hour glass abdominal markings, and she produces 1–4 egg sacs, each containing an average of 140 eggs The pair of poison glands lie superficially and behind the ocular region of the cephalothorax The venom is obtained by macerating the poison glands in salt solution, about 0 1 mg of dried venom can be got from one spider, and it is said to be five times as potent as that of the rattlesnake Hargreaves and Mackenzie[7] have lately described a case of spider bite in a Polish soldier in Palestine He was admitted to hospital with a tentative diagnosis of acute abdomen and the extreme tenderness and board-like rigidity of his abdominal wall suggested a perforated peptic ulcer On these grounds he was admitted to the surgical ward, but when the Polish interpreter arrived the patient gave a definite history of a bite by a black spider on the right buttock followed within half a minute by intense pain like cramp which spread up his back to his head, limbs and abdomen, accompanied by vomiting For three days this imitation of an abdominal emergency persisted The man's skin was bathed in cold clammy sweat, his temperature was subnormal, and he complained of aching of all his muscles including those of the face and jaw, and of his teeth No local lesion at the site of the bite could be detected A curious finding was a moderate degree of polycythæmia Subsequently the offending spider was captured and identified as the jet-black female of *Latrodectus lugubris* which is found in Palestine and Transjordania Without a clear history this condition might prove a serious pitfall for the surgeon

THE INFANT'S RED CELLS

THERE has been a lot of variation in the estimates of the normal range for red cell count, hæmoglobin, and other values in the blood of infants during the first 10 days of life Since 1921 at least twenty-six papers have appeared on the subject and the average range of red cell counts has been put as low as 3 5–4 6 million per c mm and as high as 5 9–7 7 million, the hæmoglobin range has been variously estimated as 75–135% Haldane (10 35–18 63 g per 100 c cm) or 130–162% Haldane (17 94–22 36 g per 100 c cm), the average colour-index as from 0 7 to 1 22, the average range of packed cell volume as from 34 to 79% or 52–66 5% Chuinard, Osgood, and Ellis,[8] viewing this lack of unanimity, judged the effort of repeating these investigations by standardised methods on a sufficient number of subjects worth while They took 195 infants of both sexes aged between 1 and 10 days, blood was obtained from the fontanelle and oxalated During the first 10 days of life little variation in average values with either age or sex was found so that all the figures were put together for the determination of average values and ranges The average red cell count was 4 6 million per c mm, and 95% of the observed values fell within the range 3 4–5 8 million, average hæmoglobin was 16 3 g per 100 c cm (118% Haldane), with 95% within the range 12 3–20 3 g per 100 c cm (89–149% Haldane) average colour-index was 1 28, average packed red cell volume was 43 4% with 95% of the values within the range 31 5–55 5% The cells of the newborn infant were found to be larger and to contain more hæmoglobin than adult cells These values all fall within previously reported ranges but tend on the whole to be lower, this tendency is ascribed to the early tying of the umbilical cord in all

---

[3] Vaquez, H and Bordet, E The Heart and the Aorta New Haven, 1920

[4] Hampton, A O, Bland E F and Sprague H B *Amer Heart J* 1930 6 77

[5] Fray, W W *Amer J Roentgenol* 1932 27 585

[6] D'Amour F E Becker F E and Van Riper W *Quart Rev Biol* 1936 11 123 Costa R S and Salveraglio F J *Arch Drug Med* 1939 14, 417

[7] Hargreaves W H and Mackenzie, K G F *J R Army med Cps*, 1942 78 37

[8] Chuinard E G, Osgood E E and Ellis D M *Amer J Dis Child* 1941 62, 1188

Annotations

SIR WILLIAM BRAGG

SINCE we last went to press medicine has suffered a bereavement, for Bragg was very near and dear to its heart In his Huxley lecture he opened out a new means of inquiry into the structure of living substance and gave expression to his belief, derived from X ray study of the crystal, that one and the same principle is in constant use by Nature to form living tissues which have strength and resilience, and which may also be overstrained and finally broken So he was himself a link in the chain which connects the medical care of the body with the elements of which the body is built Bragg was no re searcher Like his master, Michael Faraday, his observation of nature was a continuum "Put him to washing bottles—you'll soon see what he is fit for,' said Sir Humphry Davy when Faraday asked for a job at the Royal Institution And as a boy on the Cumberland farm, a lad, at school in the Isle of Man, a scholar at Trinity, Cambridge, or as a professor at Adelaide, Bragg made a quiet search of all that came his way, and it was only at the beginning of the second half of his 80 years that he met Rutherford and his search became systematised Faraday kept in his pocket a New Testament, which he annotated throughout the whole of his scientific career, and Bragg's personality also was closely integrated Both were simple, modest and singularly unselfish "To our own profession he was ardently attached and the tie was mutual," was said of Faraday, but it was equally true of Bragg

MILK AS EFFLUENT

THE discharge of milk waste into streams not only squanders good food but renders the water unfit for fish to live in, and this despite the shortage of fish on the kitchen front and the fact that our principal enemy has long made use of inland fish culture The treatment and disposal of waste waters from dairies and milk products factories is however being closely studied by Mr A Parker D Sc, acting director of water pollution research, and an expert staff, whose work is set out in a substantial pamphlet[1] now on sale They suggest ways of reducing the waste from milk products and for purifying the irreducible minimum which must be discarded They have also studied the microbiology of the purifying processes and give practical information on culture media, and they review the action of waste waters from the milk industry on cement—a matter of interest to anyone erecting treatment plant When an effluent is discharged into a stream the organic matter is oxidised at the expense of the dissolved oxygen in the water One way of mitigating the evil is very simple It is common experience that if a milk jug is allowed to drain after it has been emptied into the teacup quite an appreciable quantity is added to the contents of the cup The same holds true when a churn is allowed to stay on the draining rack until the trickling has ceased In many factories it is customary just to tip the milk out of the churns, such a factory receiving an average of 10,000 gal a day could save a day's milk (or about £500 a year) by allowing drainage for 1–2 min from the churns The wash water from drained churns is much more dilute and needs less treatment to render it harmless The difficulty about milk effluent is its high organic content The law presumes milk to contain at least 11 5% of total solid matter, whereas sewage contains only about 0 1%, and thus the biochemical oxygen demand of milk is 200–300 times that of average crude sewage Buttermilk contains most of the milk solids other than fat, and whey contains the lactalbumen and most of the lactose of whole milk Moreover, quite apart from pollution and waste the effluent may become disgusting from the growth of "sewage fungus" Much of the organic matter is in solution and not in the colloid state, and hence is not precipitated by the usual coagulants, ferric and aluminium salts The fixation and oxidation of organic solids must be achieved biochemically after the coagulable material has settled and been removed As with ordinary sewage it is advantageous to allow the liquid, which varies considerably in strength during the day, to flow into a large reservoir where mixing reduces such variation, the task imposed on the biochemical agents is then relatively uniform Trials on both large and small scale have shown that percolation beds with the usual spraying arm are more satisfactory than the activated sludge process, although it seems possible that a long narrow tank which allows the progress of purification to be controlled might be worth trying Percolation requires two tanks in series, the liquid passing at the rate of 320 gal per cu yd per day, the secondary filter is changed over and becomes the primary, and vice versa, about once a fortnight, and the liquid flowing through the filter is usually diluted with its own volume of clean water or—after the plant is going well—of final effluent Sedimentation in a humus tank is desirable before and after the second treatment The report shows conclusively that waste waters from milk collecting and distributing depots and from cheese factories can be made to yield a final effluent of good quality Action should follow

EARLY DIAGNOSIS OF SYPHILITIC AORTITIS

FIFTEEN or twenty years hence clinicians will probably be encountering the tertiary lesions of men and women now in the Forces who if there had been no war would never have acquired syphilitic infection Although adequate treatment and surveillance are better organised and more readily available in this war than the last many syphilitics will no doubt develop cardiovascular or neurological complications at some future date The war of 1914–18 provided many of our teaching hospitals with examples of tabes dorsalis and aortic aneurysm, but it is to be hoped that these gross disorders will be fewer and will come to medical notice at an earlier stage in the present generation Yet as long as we think of tabes dorsalis as characterised by ataxia and absent knee jerks little progress will be made Similarly, as long as students are taught that syphilitic aortitis means aortic aneurysm, aortic incompetence or occlusion of the coronary ostia, the early stages of this condition will go unnoticed Unlike tabes, however, even when the possibility is kept in mind the early diagnosis of syphilitic aortitis is often impossible Uncomplicated aortitis is one of the most difficult lesions to detect clinically Pain may be absent or insignificant, there may be no paroxysms of dyspnœa, retromanubrial dullness may be unchanged, and the finger may detect no abnormal pulsation in the suprasternal notch To a practised ear a tympanitic second aortic sound may raise suspicions, but the same type of sound can arise with arteriosclerosis or hypertension A systolic aortic murmur may likewise be due to non syphilitic aortic dilatation as well as to stenosis of congenital, rheumatic or sclerotic origin And to crown all it is not uncommon to find a rheumatic, sclerotic or hypertensive lesion of the aorta at autopsy in a syphilitic subject Acknowledging then the limitations of bedside methods of diagnosis, can we derive help from electrocardiography or radiology? The answer is "Not much" Electrocardiographic studies[1] have failed to show any significant changes during or following the primary or secondary lesions and no characteristic abnormalities in latent or tertiary syphilis Boharas and others[2] found that the electrocardiogram rarely showed abnormalities in uncomplicated syphilitic aortitis Of 160 syphilitic patients without demonstrable

---

[1] Technical Paper No 8 of the Water Pollution Research Board London H M S O Pp 125 4*s*

[1] Chamberlain, E N and Follows J H *Quart J Med* 1933 2 221, Turner K B and White P D *Arch intern Med* 1927, 39 1

[2] Boharas S, Hollander L and Goldsmith, M *Amer J med Sci* 1942, 203, 54

Special Articles

BRITISH EMPIRE CANCER CAMPAIGN INQUIRY

UNDETERRED by the bombing of hospitals and the dispersal of the population the clinical cancer research committee of the BECC[1] has continued the work begun in 1938 of collecting data about cancer in patients examined in the London hospitals Considering the difficulties that attend a follow-up scheme in the best of times the committee has been singularly successful, for out of 7867 cases registered in 1938 only 732 have not been traced Registration of new cases continued up till September, 1939 when the total was 15 068 but since then no more have been added It is hoped that all these will be followed up in the succeeding years The information is gathered from records of almost all the hospitals in the County of London and by following up the patients after they have left hospital , results are tabulated by means of a Hollerith Sorter Counter machine[2] Civil condition age-distribution, family life, reproductive functions onset of symptoms, relation to the menopause operative and other trauma, coincident disease types of treatment and results are among the details which were sorted out of the medical histories of cases of uterine cancer during the past year In the previous year similar information was obtained about cancer of the breast Failure to trace a few hundred among so many patients must be less disappointing than the somewhat frequent failure of patients to answer particular questions—for example in collecting figures for the number of children and miscarriages which preceded cancer of the body of the uterus no answer was obtained from 10% of the patients A depressing interval was found to elapse between the first appearance of symptoms and the first visit to a doctor Of the women with cancer of the body of the uterus only 20% consulted a doctor within the first three months and the majority waited for from four to eighteen months Even in the case of cancer of the cervix where early symptoms are more severe only 26% consulted a doctor within the first month only 45% within the first three months , in 27% the symptoms had existed for over six months and in 12% for more than a year Much the same tale was told of cancer of the breast in the 17th annual report There was rarely delay on the part of the doctor in taking action once he had been consulted These figures show strikingly what has long been known—the disinclination of patients to have a diagnosis confirmed which they themselves often suspect Though uterine hæmorrhage may seem more of a nuisance than part of a disease, it is fairly certain that a lump in the breast will arouse suspicion yet neglect of symptoms is about the same for both From what does this disinclination to recognise the disease arise ? From little faith in such methods of treatment as we possess and from dislike of these methods One of the avowed objects of the BECC in collecting all this information is to educate the public in the matter of early diagnosis and treatment It is to be hoped that the wisdom which has guided the BECC to undertake this inquiry will also show a way to overcome the very natural antipathies of the public

MEDICINE AND THE LAW

Injured Workman Refusing Operation

WE noted lately (*Lancet* Feb 21 p 239) a dispute between employer and workman over the latter's disinclination to undergo a surgical operation which would terminate or diminish the employer's liability to pay compensation for an accident The decision of the Court of Appeal in Redpath, Brown & Co v Hayes has been quickly followed by one of even higher authority in the House of Lords case of Steele *v* Robert George & Co So long as workmen can find a medical man to deprecate an operation they are not unreasonable in their refusal The court has not to consider directly the question to which expert medical evidence will have been devoted—namely, whether the suggested operation is desirable and reasonably safe The question is merely whether a workman if his trusted medical attendant advises against an operation, can be called unreasonable if he adopts the advice No court is likely to doubt the answer It does not matter how many and how eminent are the surgeons called by the employers on the other side

Mr Steele was a joiner who falling from a height on to a tiled floor sustained four years ago a comminuted fracture of the left ankle-joint He was compensated for 2½ years on the basis of total incapacity At that point his employers sought to terminate their payments because henceforth in their view, his disability was due not so much to his accident as to his unreasonable refusal to submit to a surgical operation Two surgeons, one of whom had attended him in hospital and had seen him often in the following two years told the court that a reasonable operation involving no worse risk than that which attends any operation, would give him a strong stable limb His trade-union had sent him to a surgeon who advised against operation The Recorder of Belfast (whose jurisdiction in these matters is equivalent to that of a county court judge in England) was satisfied that the operation gave Steele a reasonable chance of being able to do some work and of freeing himself from pain the alternative was a lifetime of pain and idleness The Recorder could not hold Steele unreasonable in following the advice of a competent surgeon he therefore decided against the employers and the House of Lords refuses to interfere with his findings It was said Lord Simon, a plain question of fact If the Recorder had found Steele unreasonable in his refusal that finding would have been equally incontrovertible

There is no general rule of law excusing a workman from undergoing a reasonable operation because his medical man advises against it Each case observed Lord Birkenhead in 1921 in Fife Coal Co v Cant must be considered upon its own facts When the workman is advised, by a skilled medical man in whom he has confidence, not to undergo operation it would be necessary to bring home to the workman an extremely strong body of expert advice to the contrary before the court would allow the employer to have discharged the onus of proving him to have been unreasonable The question of the patient's right to be assured of the provision and maintenance of an artificial limb before being persuaded to submit to amputation raised in the Court of Appeal in the Hayes case, does not seem to have arisen in the House of Lords in the case of Steele Both cases show the regrettable gap which industry and law tolerate between compensation for injury and rehabilitation for further employment To the layman they may also serve as a fresh instance of the diversity of medical testimony We all know that some practitioners favour operation and others do not It is unnecessary to suggest that the employers will call in the one type and the trade-union the other

PALESTINE

TOO MANY DOCTORS

DURING the last few years a great many doctors have reached Palestine from central Europe and it has only been possible so far to grant new licences to practise to about 60–90 a year Up to a few weeks ago those lacking licences numbered about 300, but the High Commissioner has lately published his intention of granting a further 90 licences in 1942 The unlicensed doctors are suffering not only financially but mentally from their unemployment and are anxious that the government should grant licences to practise to all The problem is not easy, because the country is already overstocked with doctors—a state found nowhere else in the world In Tel-Aviv, for example there are about 900 doctors or 1 to every 200 inhabitants The situation in Haifa and Jerusalem is similar though perhaps not quite so bad In Palestine as a whole there are about 3000 doctors, or 1 to every 500 inhabitants including those of the country districts and the Arab population As a result the standard of living among the medical profession is very low, many doctors being unable to earn more than £8–10 a month Thanks to the increased cost of living this is far below an income which would support them and social institutions—not merely medical associations—are taxed to the utmost to provide for needy doctors, many of whom are grateful even for a free meal The reasons their subjects, which was done to eliminate as far as possible the variable factor of expressed placental blood In spite of these precautions, the ranges of values into which 95% of the observations fit are wide It is clear that considerable variability in the normal newborn infant's blood-count must be accepted and we must be correspondingly cautious about regarding as pathological counts that differ from the expected average

---

[1] British Empire Cancer Campaign Eighteenth annual report, 1941, p 191 [2] Sixteenth annual report 1939 p 34

WATER-BORNE PARATYPHOID B

AN outbreak of water borne paratyphoid B fever in July, 1941, is reported from Brixworth[1] It was restricted to the occupants of a group of cottages whose water supply was obviously liable to gross pollution The small surface well of 25 gallons capacity was situated in a courtyard with a pervious surface and open sluice drains, this yard was surrounded by the cottages, a row of hand flushed water closets, ash pits and a farm garden The water supply was the only factor common to the cottagers and not shared by the rest of Brixworth, it was suspect from the first Among a population of 34 at risk, 4 developed enteric fever and 21 others excreted paratyphoid bacilli in their fæces at some time The report draws attention to a number of unusual features In contrast with typhoid fever, authentic outbreaks of water borne paratyphoid B fever are very uncommon *Bacterium paratyphosum B* has not previously been isolated from a water supply In this outbreak the organism was identified by three independent laboratories The water remained infected for three weeks The contamination was so heavy that an almost pure culture was obtained from as little as 0 1 ml of one sample A bacteriophage was also present The organism was predominantly, but not exclusively, in the group phase in both water and stools Agglutination reactions were likewise interesting—some high titres to salmonella group suspensions were obtained, as well as significant titres to paratyphoid B (H and O) One of the cottagers was regarded as the primary case and the source of the contamination of the water-supply, but this was not proved It is of interest to note the high proportion of infected persons (25 out of 34 at risk) and the relatively low proportion of cases among the infected (4 out of 25) Many of the unusual features of this outbreak can perhaps be attributed to the exceptionally heavy contamination of a small water supply

FINLAY INSTITUTE OF THE AMERICAS

WITH the help of Columbus and his colleagues Europe discovered the Americas several centuries ago, the Americas are only discovering each other today But they have quickly found what a lot they have in common, and the decision taken at Havana on Jan 6 to set up the new Finlay Institute of the Americas should add a useful and enduring link to the bond between the two continents The new institute has been established to "foster research and education in the field of tropical medicine and to provide for an increased interchange of medical students and teachers among scientific medical institutions in all the American nations" Executive offices are to be opened in Havana and New York and the Cuban government have promised an annual grant of 20 000 dollars for maintenance American industrialists and philanthropists have also made substantial contributions Dr James E Paullin, president elect of the American College of Surgeons, has been appointed chairman of the scientific advisory committee, and other members will include Dr Edgar Mayer, assistant professor of medicine in Cornell University and also, in the University of Havana, Dr Enrique Saladrigas, director of the Havana Finlay Institute, Dr Rafael Menocal, professor of surgery in the University of Havana, and Dr Felix Hurtado assistant minister of public health for Cuba The constitution of the new institute is now being drawn up Readers of the pious biography of Carlos Finlay, written by his son,[1] will be pleased that his work on the mosquito transmission of yellow fever should receive this honourable commemoration

HEARTBURN DURING PREGNANCY

AT some stage of their pregnancy about two mothers out of three suffer from heartburn This is a feeling as if some scalding liquid suddenly appeared at the lower end of the gullet and from there passed upwards to the mouth It has no obvious relation to food but is often related to posture, lying on the right side being especially liable to bring it on As a rule it is accompanied by profuse salivation Heartburn may be no more than an inconvenience, easily checked by home remedies, or it may be severe enough to make sleep impossible and resist all efforts at relief It is most common during the 6th, 7th and 8th month of pregnancy, though it may appear at any stage, and is most severe when it occurs in the later months It is aggravated by the causes which aggravate dyspepsia—worry and overwork, excesses of food or drink, and a nervous temperament A severe attack may leave the lower end of the œsophagus sensitive to hot drinks, or indeed to any food or drink Regurgitation of acid gastric juice is the explanation which best fits in with the patient's sensations, and this explanation was generally accepted until the changes in gastric acidity during pregnancy were closely studied It then appeared that gastric acidity falls steadily during pregnancy, and is lowest in the months when heartburn is most common It was found, too, that heartburn could as often be relieved with hydrochloric acid as with alkalis The fault seems to be mechanical rather than chemical By means of a swallowed balloon Chester Jones demonstrated that the sensation of heartburn could be produced by distending the lower end of the œsophagus, and he followed this observation by another that the sensation could be produced by introducing even a bland fluid into the lower œsophagus through a catheter A barium swallow during an attack of heartburn revealed that the cardiac sphincter was tightly closed and that waves of reverse peristalsis were carrying the barium upwards Williams,[2] of Beverly Hills ascribes the heartburn of pregnancy to interference with the neuromuscular mechanism of the œsophagus arising from the dislocation of the stomach by the enlarging uterus He has confirmed the observations of Rolf Hanson that in the later stages of pregnancy the stomach comes to lie with its long axis more horizontal and the greater curvature pushed up towards the cardia, motility is much reduced and the emptying time prolonged conditions which favour the regurgitation of gastric contents into the œsophagus In Williams's cases of heartburn definite anatomical abnormalities such as hiatus hernia, were rare On the analogy of postoperative atony he treated 16 cases with injections of 1 c cm of 1 in 2000 'Prostigmin' (Roche), finding that a single dose relieved 14 of them within 24 hours, the relief lasting for 7–10 days, when a second injection was given with similar success By repeated injections these patients were kept free from symptoms with no ill effects But this is not an easy complaint in which to assess the value of treatment, for as A M Campbell said in the discussion of Williams's paper many cases can be relieved by attention to emotional and environmental maladjustments and a well balanced diet

The Minister of Health has appointed Dr FINDLAY MURCHIE to be deputy director general of the Emergency Medical Services Dr Murchie, who is a barrister at law of the Middle Temple, has been a principal medical officer of the Ministry of Pensions

---

[1] *Mon Bull emer publ Hlth Lab Serv* February, 1942, p 1

[1] *Lancet* 1941 ii 167

[2] Williams, N H *Amer J Obstet Gynec* 1941 42, 814

-called, to see if he dare spread both sides of a scone e funny side is harder to see when his arithmetic oves inaccurate and one is left to swallow a thick slice national loaf with grossly inadequate lubrication me members of the staff were a little slow to realise at the position on the food front had altered The st-night on which milk was conspicuous by its shortage e anæsthetist, who lives on a plus-milk diet, was at nner The main course was Iceland cod and justifiably hough he was thirsty after it Automatically he ached out for the milk jug and poured out for himself bout half of the total allowance for us all He quickly ppreciated the enormity of his offence but his abject pologies did nothing to restore the lost milk or to make a without it any more palatable The most annoying spect of the performance is that he becomes no fatter spite of the milk diet Sugar too is not so plentiful s it used to be and a series of priorities at the breakfast ble has resulted The good Scots of the company, nd those who ape them, appear early for their meal ut the Sassenachs tend to defer rising until there will e none to observe how they waste the mercies on their orridge Unfortunately the latter constitute the ajority of the staff and my little secret has leaked out, o I can no longer empty the sugar bowl with a clear onscience knowing that there is no-one else to follow

* * *

Our latest lieutenant-and-quartermaster runs a class or N C O s, and we're learning a lot In the Army, he ays, there are no such words as fair and share the oldier mustn't expect to do his fair share, he must do hat he's told And proper N C O s don't say "Here ill, you might get a cloth and give this room a bit of a ipe round" they say "Private Reed, scrub this room ut"

Personally I have always liked the idea of a citizen army, with orders at a minimum because every man wants to do his share, and more than his share, and I suspect that in places like Libya, where they really fight, commands are still mostly given in the form of "Here Bill, you might get a couple of Bren-gun carriers and mop up this oasis" But perhaps I believe in citizen armies because I have not yet got rid of my anachronistic preference for civilians and civility In my last unit there was a quiet little Canadian officer who had been trained at the Canadian military academy but would not join the Canadian Army because, he said, its officers are too matey with their men off parade He was a real soldier, and he thought the Germans in France quite right in driving their tanks over carloads of refugees who blocked their road

War is no respecter of persons Which makes it difficult for the doctor, who has been trained to respect them always

* * *

Now that we cannot get our regular P G Wodehouse, I have turned to John Glyder In many ways they resemble one another Their plots are intricate, their English is good, and they are clean We have to remember of Wodehouse that in the twenty years between the wars when novelists on both sides of the Atlantic were working out all the permutations and combinations of the sexual act he never wrote a word that a late Victorian could not have read aloud to his maiden aunt Glyder does not even give our minds the strain of recognising quotations from other writers His sentences are short and pithy though somewhat staccato, like the dance steps of his heroes and heroines who walk in a less exalted sphere of life than those of P G The highest that I have met are people who would inhabit the villas erected in the parks sold by the relatives of Mr Bertram Wooster Usually a city clerk and a girl typist fill the bill The plot may have many variations but has a constant theme The couple are thrown together with some vehemence and hate at first sight results This becomes more vehement but is followed by a slow or rapid change and turns to love The book closes with the young lady in her hero's arms or her baby in the bassinette The certainty of this saves one the trouble of looking at the end when taking down the volume from the library shelves Glyder affords mental rest in these times to those whose brains do not want to work out the intricacies of a detective novel or a crossword puzzle, neutralises a middle-aged insomnia or occupies the mind in a London bus

Letters to the Editor

PERFORATED PEPTIC ULCER DURING AIR-RAIDING

SIR,—The paper of Stewart and Winser in your issue of Feb 28 is one of the few attempts in the world literature to give some sort of quantitative estimate of the importance of a particular group of factors in causing perforation In the hope that other workers in blitzed towns will contribute further statistics and further details might I summarise my two chief objections to the authors' conclusions as stated in their summary

A knowledge of the association between head injuries and peptic ulcers dates back at least as far as the eighteenth century and the autonomic nervous system has been blamed for over a hundred years At present the psychological theory is enjoying its third wave of popularity, the previous waves having subsided as the result of attempts to connect the clinical and experimental facts Hypothalamic stimulation apparently produces ulcers by causing gross gastric peristalsis (which means a mechanical strain), gross hypersecretion of a very potent juice, and an œdema of the mucosa which may well lower its resistance by impeding the exchange of oxygen and metabolites between epithelial cell and capillary To the best of my knowledge there is no evidence to suggest that anything like this occurs in human beings as the result of emotion On the contrary, there is quite a lot of scattered evidence that the effect of anxiety or fear is to produce gastric rest, and even loss of tone with hyposecretion In some twenty cases which the surgeons considered relatively acute perforations, and which have come under my notice in the last six years, careful inquiry into the prodromal symptoms elicited nothing to suggest violent peristalsis Those who had noted what the effect of fear on their bowels was gave the same sort of story as normals—that is, an initial tendency to a complete evacuation of the colon, followed by abdominal rest

My second difficulty in believing that emotion produces ulcers at all directly lies in the age and sex distribution of Stewart and Winser's material I can with great difficulty just accept it as possible that the Victorian girl between the ages of 15 and 20 suffered ten to twenty times as much anxiety as her Victorian male contemporary But it is a little too queer to find that the worst London blitz is only about one two-hundredth part as terrifying to the girl as ordinary Victorian life and about six times as terrifying to the male

I still see no reason for modifying those views on the ætiology of ulcer which I have previously put forward in your columns The function of the gut is not only to prepare food and absorb it, but also to keep bacteria out Anxiety is only one of a number of factors which impair the sterilising mechanisms of the gut, though it may often be the last and hence most obvious straw Irritation by bacteria and bacterial products is the principal cause of the infiltration of the mucosa with inflammatory cells It is the local loss of resistance caused by these infiltrations which leads to erosive duodenitis and antritis, and it is spasm and the consequent cessation of peristaltic wear and tear which causes most of the erosions to heal and the unlucky ones on the rim of the spasm to progress into ulcers The mechanism of gastric-ulcer formation is similar in principle though there are important differences Hyperchlorhydria and changes in gastric motility are the result of lesions at the pylorus and not the cause Some such working hypothesis is necessary if we are to explain all the thirty-odd anomalies in the life history of ulcers and not merely two or three of them

RSM House, W 1 — DENYS JENNINGS

TRAUMA AND LEUKÆMIA

SIR,—Your annotation (March 7, p 300) was of special interest to me because last December I saw a man of 42 from the Midlands who in September, 1940, had a septic finger of the right hand following a cut at work and within a few days the epitrochlear and axillary glands on the affected side became swollen and tender Although the finger healed satisfactorily "the lumps never went down" Within a few months he noticed lumps in the neck and groins and when seen by his for this state of affairs are complex The whole country is poor, still in the early stages of its development, and many of the immigrant Jews have arrived there penniless having lost all their savings and thankful to have escaped with their lives The excess of doctors and the general poverty make it necessary for those practising to accept very low fees, and many are glad to give a private consultation for a shilling In the long run the situation is bound to reflect on the health of the country The struggling doctors cannot spare time for postgraduate studies and cannot afford to subscribe to medical journals, or even to take necessary holidays Surely it should be possible to employ some of them on one or other of the war fronts they would be glad of the chance to carry out this duty Some months ago the Medical Association of Jewish Physicians offered the Soviet Government a large number of physicians and surgeons willing to serve on the Russian front Those who still lack licences would be particularly glad of the opportunity to serve

In England Now

A Running Commentary by Peripatetic Correspondents

WE gathered from far and wide in the court room over the police station, a motley collection of doctors, billeting officers and welfare workers, to meet a treacle-tongued lady from the Ministry and to take steps "for the better disposal of sick evacuated children" When I got there a doctor obviously new to the game was declaiming against the higher grades of the incontinents, the diurnal wetters, the fæcal fondlers The others listened bored to this oft-told tale—had it not been hurled to them down telephone wires, erupted volcanically from front doors, shouted from indignant garden gates? The ministerial lady sought to wipe away the rudities of reality with the soft paper of official phrase, and we went into committee It would be much better if we had a hostel for each disease rather than Although what I took to be the dock was vacant, by implication at any rate it was bulging with the imbecile, Epstein figure of Incontinence, and although the mayor's seat on the bench was covered only with coats and hats I had a feeling that there was an old lady there, a resolute, shabby old dear with odd wisps of hair poking out under her bonnet, and with lovely eyes like blue pansies Finally we arranged a new sort of metric scale 2 impetigos = 1 scabies, 3 scabies = 1 bed-wetter

Afterwards I offered the old lady a lift home, and she became expansive "We've had a lot of trouble with this subject from the start," she said "First of all we had only one lead for the two wires, and when you switched on the light in the procreation room it shone in the lavatory as well They called it the "pudendal" too, enough to make people shy about it, like calling a boy Cedric Then at the beginning of life we had to have a hair-trigger mechanism—one couldn't subject the infant bladder and bowel to pressure After that we had to interest the babe in his own products, after all it was the first thing he'd ever produced, and if he wasn't interested in that he'd never be interested in his magnificent body later on, or the products of his hand and mind, things like chairs or sermons At the same time we had to make the excreta of others abhorrent to him for sanitary reasons—except, of course, a mother her child's Then for fighting purposes we had to rob even the adults of control when under the influence of fear All very difficult Of course, if you want to punish them you should make them clean up each other's mess—they'd hate that!" "But didn't you hear what the welfare lady said about punishment?" I asked "Yes," she replied, "they talk about me being 'red in tooth and claw,' but for pure prolonged cruelty commend me to Christian kindness I have a good deal of sympathy with the incontinents They've been robbed of their homes, their natural safeties, their natural environment for developing, no wonder they use incontinence as an instrument of policy, as the League of Nations used to say, to get sent home, to spite their foster parents, and so on No wonder they become untidy" "Untidy!" I ejaculated "Yes untidy, but not as untidy as the adults who are lacerating my good earth incontinent with life and the fruits of the field Hark at that now—bang goes the glycerin out of my very bones Well, I get out here" The guns from the distant range were booming away and the wind whistled keenly over the wine-stained moor "Bit bleak and inconvenient, isn't it?" I said "My dear boy," she laughed as she hobbled away, "it's all conveniences"

* * *

My fellow peripatetic's remarks on S M Lambert "A Yankee Doctor in Paradise" sent me to my bookseller, but so far I have not been able to get a copy For I knew Lambert in ex-German New Guinea, now occupied by the Japanese There in Rabaul I came under the spell of his bigmindedness, sense of humour and gusto for life and work What little I know about hookworm and its subtle effects on white and black human bodies I learned from him Soon after his arrival to survey the incidence of hookworm in the islands I found my corporal doing nothing else but counting ankylostoma eggs in fæces So great was the corporal's enthusiasm for his arithmetical and odoriferous job that I began to notice in him a growing reluctance to break off and do some other task connected with the routine of a native hospital It was no use complaining to Lambert about it, because when I did he merely twinkled and made some wisecrack about the paramount claims of science or the singleminded aims of corporals comparable with the inspirations that come to artists in garrets I hope I replied that it was just as well that the corporal was doing the job in the open air under the palm trees and not in a garret Lambert infected everyone with his enthusiasm and he seemed to know everything worth knowing He looked on the social amenities of the island with a shrewd and jesting eye and found much merriment in the efforts of some of the garrison ladies to create social strata in the small community of some 200 white people He approved heartily when I refused to obey the command of the colonel's lady to give up playing tennis with the tradesmen and their wives, who incidentally played real lawn tennis and not bumble-puppy He comforted me during the period of ostracism which followed and was amused when it soon ended with an invitation to tea at the colonel's house The real reason for my pardon was that the Pekinese had contracted colic and I was ordered to prescribe treatment

The most vivid memory that I have of Lambert is connected with my first experience of field research, or rather jungle research In some way or other the question arose as to how much venereal disease there really was among the natives I said that I was treating so many cases at the native hospital, but my statement drew forth a scornful exclamatory Americanism such as "So what!" or "Shucks!" and "That doesn't tell us the incidence of venereal disease among the natives Let's examine a thousand of 'em next Saturday afternoon Get your corporal to collect 'em" I said he was probably too busy being singleminded about hookworm eggs, but that I would see what could be done Next Saturday afternoon a thousand native boys—some with grey hair—were paraded in a clearing of the jungle well away from the town and Lambert and I arrived with camp stools and began to do field research Lambert took the notes and I—to put it euphemistically—carried out the clinical examinations The native boys came past us in single file It must have been a grand spectacle Half way through the afternoon there was a burst of sudden laughter from Lambert, and on my inquiring what was biting him he said "I wish I'd brought my camera with me, because I should have liked a picture of you and your gimlet eye hunting down the wily gonococcus in the jungle Big game hunting in Africa has nothing on it!" Anyhow we answered Lambert's question about the incidence of venereal disease among the males and we did a sample of the native ladies in the privacy of the hospital the following Saturday afternoon For two afternoons I was done out of my game of tennis with the bourgeoisie

* * *

The full impact of the recent reductions in food rations has at last made itself felt among the medical staff of our hospital It is not that there ever was any superfluity of edibles—far from it—but whereas formerly individual likes and dislikes left a small margin of safety now there is just enough to go round and no more The position, however, has its compensations I love to watch a hungry resident count the lumps of butter, e engine and start as usual When the engine had arted and was running steadily the charger plug was alled out of its dash socket, the main switched off and e length of flex hung up on the wall In this way one ad the assistance of the mains in starting every morning s well as a small overnight charge I still use the harger for my wireless accumulators since it could be rranged for 2, 6 or 12-volt accumulators

Secondly the heating Here my memory fails me as o the name of the manufacturer but one could obtain a eating element which replaced the radiator drain plug nd from it flex ran to the dashboard socket All one ad to do was to plug in and the radiator water was kept arm and circulating all the time the car stood in the arage

One afterthought—one has to remember always to isconnect the plugs before driving out The penalties f *forgetfulness are startling (if not electrifying)*

London, W C 2 JOHN FOLEY.

A HEREDITARY TENDENCY TO HERNIA

SIR —I was interested in Dr Evans's report of a family with a high incidence of hernia (*Lancet*, March 7, p 293) Many years ago I was commissioned by the Local Government Board to investigate the prevalence of hernia, the results were published in the annual report (1908–09) of the medical officer of the board I investigated the family history in 9837 cases of congenital inguinal and umbilical hernia and found that 28% had relatives who suffered from hernia, but in a comparable control group of 502 unruptured children I found that 145—that is 28 8%—had relatives suffering from hernia When those with *more than one* relative affected were enumerated, however, a difference was found in the two groups nearly 17% of the ruptured children but less than 1% of the unruptured could claim two or more ruptured kin This suggests that heredity is only a causative factor when there are multiple cases in the family

West Middlesex County Hospital J BASIL COOK

PAPER HANDKERCHIEFS

SIR,—The supply of paper handkerchiefs has been completely cut off, constituting extreme hardship to victims of head or chest complaints, and a danger of infection to others from expectoration, &c —a never ceasing discharge may, for *example, result from severe* nasal sinusitis It would be a real boon if you would use your influence, direct and in association with medical MPs, to secure immediate and unrestricted supplies of these handkerchiefs

London, W C 1 RETIRED SURGEON

NFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED MARCH 7

Notifications —The following cases of infectious disease ere notified during the week smallpox, 0 scarlet ever, 1231, whooping-cough 1290, diphtheria, 876 aratyphoid, 12, typhoid, 10, measles (excluding ubella) 2550, pneumonia (primary or influenzal), 1276, puerperal pyrexia, 198, cerebrospinal fever, 218, poliomyelitis, 3, polio *encephalitis*, 2, encephalitis lethargica, 8; dysentery, 120, ophthalmia neonatorum, 79 No case of cholera, plague or typhus fever was notified during the week

Deaths —In 126 great towns there were no deaths from enteric fevers or scarlet fever, 1 (1) from measles 8 (2) from whooping-cough, 19 (0) from diphtheria, 38 (4) from diarrhœa and enteritis under 2 years, and 62 (10) from influenza The figures in parentheses are those for London itself

Birmingham had 3 deaths from diphtheria Fatal cases of influenza were scattered over forty one great towns Stoke on Trent reporting 4

The number of stillbirths notified during the week was 234 (corresponding to a rate of 43 per thousand total births), including 37 in London

---

MEDICO LEGAL SOCIETY —A meeting of this society will be held at 26, Portland Place, London, W 1, on *Thursday*, March 26 at 5 P M, when Dr Donald Norris will speak on personal injury by accident

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS M P

THE House of Commons is getting a little dislocated in its procedure in relation to the work of the Cabinet On March 3 Major Gwilym Lloyd George announced the policy of the Ministry of Food[1] but avoided decision on the vital question of whole-wheat bread He stated however that *if it were decided to make* whole-wheat bread arrangements were in hand to make the change quickly Only a few days later, on March 11 Lord Woolton rising in the House of Lords to answer an arranged question by Lord Southwood, announced a complete new policy "His Majesty's Government have therefore decided to increase to 85% the ratio of flour from milled wheat in this country This means we shall stop the production of white bread" This decision was taken in view of the "increased strain on our shipping resources This announcement was a complete surprise to those interested in the scientific side of the question—Sir Ernest Graham-Little, for instance, was unaware that Lord Woolton was making a statement until it had actually been made Perhaps this dislocation between the House and the executive was a yielding to scientific arguments, but if so it was a quick conversion

Lord Woolton said that he would frame an order prescribing a detailed technical specification for wheatmeal but he would need the help of local authorities to maintain it The saving in shipping will be a considerable contribution to the war effort

Lord Hankey who, *until the recent changes in Govern*ment, presided over the scientific advisory committee, forecast that the nation would never regret the change "subject to one paramount condition—namely, that the millers and bakers play their part in producing a palatable bread all over the country" He also hoped that the reform would be extended as soon as possible to the fighting services Lord Horder welcomed the decision "to make a definite, uniform, controlled, supervised *form of flour for national use*," and assured their Lordships that he and his colleagues "are uniformly of the opinion that no single step which the Government could have taken in respect of the nation's food is so calculated as this one to raise the level of the nation's nutrition" The national wheatmeal bread would be suitable in all forms of illness in which bread is allowed and it would be of greater benefit to those who are still living below the poverty-line for they are the slowest to change old habits in the matter of *basic foods*

So the matter ended for the time with a victory for science because it had an economic ally in shipping

FROM THE PRESS GALLERY

Miller, Baker and Consumer

In the House of Lords on March 11 the Minister of Food announced that as from April 6 it will not be permissible, except under licence to sell any white bread The only bread on sale will be national wheatmeal bread, or authorised specialty brown breads As from April 20 an order will take effect prohibiting the manufacture of any article of food unless at least three-quarters of the flour contained in that article consists of flour of not less than 85% extraction From April 20 biscuits, cakes and flour confectionery will be made of the same type of flour as is permitted for bread The total use of 85% extraction flour will not be insisted upon until the existing *stocks of white flour* have been used up Lord Woolton also stated that he intended to place further limitations on the production of sugar confectionery, including chocolate, and of biscuits As a deterrent to operators in the black market the Government had decided to introduce new Defence Regulations, raising the maximum term of imprisonment to fourteen years' penal servitude and to twelve months' imprisonment on summary conviction

Supplementary Old-age Pensions

In the debate in the House of Commons on March 12, on the Assistance Board's report on the administration of the Determination of Needs Act Mr ERNEST BROWN doctor, in June, 1941 there was generalised enlargement of the lymph-nodes, the spleen was palpable and the blood picture typical of lymphatic leukæmia. This case appears to satisfy all six of Ewing's criteria on the relationship of injury to tumour formation—viz., (1) authenticity and adequacy of the tumour; (2) previous integrity of the wounded part; (3) a reasonable time relation (3 weeks to 3 years); (4) continuity of symptoms of the injury with those of the tumour; (5) microscopical or other proof of the existence and histological type of a tumour; and (6) location of the tumour at the point of injury.

---

[1] *Lancet* March 14 p 338

Of 65 personally observed cases of chronic lymphatic leukæmia only one other relates his disease to injury. He had scraped his ankle with a rake; sepsis supervened but healing occurred within 3 weeks; several months later there appeared enlarged cervical lymph-nodes—the first manifest sign of his lymphatic leukæmia. In this case, however, the first glands to be observed were not those draining the injured part. In these 65 cases at least 10 *give a history of sepsis preceding the onset* of their blood disease.

It is true that in my case the causal relationship of injury to the leukæmia falls short of the strict criteria of scientific proof, but it is equally true that in the absence of further observations to regard the association as merely casual is premature. In Lewsen's case (which you quote) the court remained unconvinced. What should be attitude of a medical assessor in a case where the sequence of events is so clearly—injury, enlargement of lymph-nodes draining the injured area, lymphatic leukæmia?

Liverpool. HENRY COHEN.

MASS RADIOSCOPY AND RADIOGRAPHY

SIR,—Dr. Brailsford and I are in complete agreement when he refers to the dangers to which radioscopists are subjected. Among other criticisms of the method I emphasised "the possible risk to the examiner from long exposure." As regards mass radiography by the method of miniature screen photography we are completely at variance. In your leader in the same issue entitled Machine Tools of Mass Radiography you speak of the superb results now being obtained in London by my colleague Miss K. C. Clark and her staff, and you point out "no trouble should be spared to make the screen miniature a success, for economy of time and material are on its side." Were Dr. Brailsford to see for himself the quality of several thousand technically satisfactory screen miniatures produced by these workers and then to compare them with the full-size control films it is difficult to believe he could continue his opposition.

Wimpole Street, W.1. PHILIP ELLMAN.

RESUSCITATION IN SHOCK

SIR,—In your summary of a R.S.M. discussion (Feb. 28, p. 265) on resuscitation in shock I see no mention of one method that I believe is the most important of all—that is, slapping the precordial area with the corner of a wet towel. Where the chest is already open, as in operations on the thorax or abdomen, one may admit that squeezing the heart is the right because the most rapid thing. But deaths upon the table do occur, and perhaps most often during induction of anæsthesia for operations, often called minor, such as the removal of tonsils. Under such conditions I do not think the thorax should be opened until slapping the precordial area has been first used; there is always time to employ it while preparing for the major operation of cardiac massage. The towel must be swung above the head and be brought down with full force upon the chest in front of the heart. Oxygenation is essential and should be done by Sylvester's method of artificial respiration, the anæsthetist giving the whole of his attention and power to this while someone else attends to the oxygen apparatus. With the coming of Schafer's method of resuscitation, Sylvester's method has been forgotten, especially the pull at the end of inspiration and the push at the end of expiration, but for the patient on the operating table it is the method of choice. The slaps must be synchronous with the artificial respiration when the arms are being pulled up. Usually signs of life show themselves after two slaps; if after a third no signs of life showed themselves, I would consent to the abdomen or chest being opened, by which time the surgeon might be ready—but I have never known it necessary. I learnt this in Killian's clinic in Berlin in 1912 and have used it often. Admittedly many of those in whom I have used it would not have died but in these emergencies it is the first fifteen seconds that matter most and after them the next. I am certain, however, that one owes her life to it. She was a *highly intelligent child of 7 with septic* scarlet fever and bilateral mastoiditis; I took twenty minutes to open these two mastoids at the end of which time her heart gave out. Except for opacity of the cornea she had all the physical signs of death with widely dilated pupils, no sign of the heart beating either in the chest wall or at the pulse and no evidence of respiration. I believe that the first sign of recovering in such cases is a contraction of the pupil so that one can again see the iris. I should not operate in such a patient today because I now know from this and other cases how toxic the hæmolytic streptococcus may be to the heart muscle in the acute invasive stage of a severe infection, and I also know when the patient's life is endangered in mastoid *disease and it is not nearly so often as I then thought.* But I am sure that that young woman who came to see me the other day to show me her wedding ring and tell me her new name owes her life to Killian and is an example of picking up bits of technique by visits to other clinics.

Guy's Hospital, S.E.1. T. B. LAYTON.

POSTWAR MEDICAL LEGISLATION

SIR,—Today the medical profession and general public fundamentally agree that the state should shoulder the financial responsibilities of a national medical service. This service must include the hospitals, public health and industrial medicine, and an up-to-date general practitioner service with clinics equipped with physical and biochemical diagnostic facilities and the means of providing electrotherapeutics, massage and physical medicine. The hospitals, both voluntary and municipal, should be controlled on a regional basis, either through the local authorities or by the Ministry of Health. Public health should continue under the Ministry of Health with the incorporation of industrial medicine. These services taken as a whole are impersonal as compared with the medical and psychological work of general practice. The personal relationship and free choice of doctor is a very vital factor in the application of medicine in the homes of the people. Therefore I should propose as a solution to the postwar problem of medical legislation the setting-up of a British medical corporation to administer a national general practitioner service complete with consulting services based on national clinics. This corporation would be responsible to Parliament and constituted by members of the medical profession, British Medical Association, Medical Practitioners' Union and Socialist Medical Association, with Government representation. Parliament would finance this and collect funds for the corporation's administration either through the National Health Insurance Act or by means similar to the wireless licences which finance the B.B.C. Thus, without disturbing the many acts on which our public-health services have been founded a bill could be introduced to the House after the war incorporating the B.M.C. to administer an up-to-date practitioner and clinic service acceptable to public and doctors alike.

Tunbridge Wells. E. F. ST. JOHN LYBURN.

STARTING FROM COLD

SIR,—Your peripatetic correspondent of March 7 cannot have searched very far for modernistic car gadgets. They both existed before the war, not quite as he suggests but near enough I think to satisfy his requirements.

First the starting. Some years ago I bought an open sports car which had a very doubtful battery—at least as far as starting on a cold morning was concerned. Once started and warm it would be quite satisfactory for the rest of the day. Its hesitation might have been due to the fact that it was left out in the open all night, but subsequent history proved that the cells needed new plates. In any case I bought a Clarke's 'Atlas' battery charger which led a small but useful charge all night long into the battery. All one did on arriving home was to insert a mains (A.C.) plug into a dashboard socket and switch on. The procedure in the morning was switch on

Obituary

HENRY BRITTEN BRACKENBURY

KT M R C S HON M D R U I LL D WALES

By the death of Sir Henry Brackenbury the medical profession has lost one of its rare statesmen and the general practitioner his stoutest advocate For over thirty years he has been an outstanding figure in medical politics and his work will live after him, for it was the product of an unusually logical mind one of the finest I have ever known, and an unselfish devotion to the service of the community that only those who were in close contact with him could fully appreciate Brackenbury was a man who would have risen high in any branch of public work. It was a lasting regret to many of us that his two attempts to enter Parliament as a Liberal candidate failed, for he would have represented the working medical man in the Commons better than any man I have ever seen there He had already made his mark in municipal affairs and particularly in the educational world when during the Insurance Act struggle from 1911 onwards he fortunately for us, turned his attention to medical politics His record is one of which any man might be proud as can be seen from the books of reference But my own feelings at the present time apart from those caused by the loss of an old and dear friend are mainly of deep regret that his wise counsel should be lost to us at this moment for he remained active with his pen to the very last and was taking a characteristically critical but constructive interest in the proposals for medical planning for the future For him that *future* had no promise whatever unless it recognised and used to the full the family doctor, of whose position and scope he wrote so wisely in his book 'Patient and Doctor' He inevitably held many chairmanships but I never thought that he was one of the born chairmen—his brain moved so rapidly and so logically that he was apt to be impatient of slower and less logical people and therefore he was apt to intervene sometimes when it would have been better to give more rope But as a wise counsellor and a master of written and spoken argument he had few equals and no superiors in my time He was not what is generally called a good mixer, but behind a somewhat austere appearance we who saw much of him knew that there was a great fund of kindliness and affection When he was in a fight—which he tried always to avoid if possible by conciliation and reason—there was no more ardent spirit or better strategist and he always earned the respect of those whose views he felt had to be fought I think his greatest personal triumph was the advocacy of the claim of the insurance practitioners for an increased capitation fee before the Court of Arbitration ('Even the ranks of Tuscany could scarce forbear to cheer') He was warmly complimented by the court and received from the rank and file of the profession a richly deserved testimonial which is unique in my experience and which greatly touched him It is a melancholy but a pious duty to say hail and farewell to one who gave splendid gifts of the mind a high ethical standard and complete unselfishness unreservedly to the service of his profession

Elliott & Fry

A C

Henry Britten Brackenbury was born at Manchester in 1866 son the of Rev Thomas Brackenbury and was educated at Kingswood School Bath, and Westminster Hospital from which he qualified in 1887. He held a series of hospital appointments in London before settling in general practice in Hornsey where he stayed until his retirement in 1927 He entered at once into the public life of the borough becoming first chairman of the education committee and then mayor Later on ceasing to be alderman he was made freeman of the borough He was also a governor of various schools for girls and for boys, in the neighbourhood He became a member of the BMA Council in 1914 and was chairman of the representative body 1924–27 For the ten preceding years he had been chairman of the Insurance Acts Committee, and as such presented the doctors' case before the court of inquiry on the capitation fee when the legal member of the court congratulated the medical profession on having so able an advocate We shall he said have to steel our hearts against being unduly influenced by his pleadings Later Brackenbury recalled his speech as the happiest three-quarters of an hour of his life In 1925 he was elected a direct representative for England on the General Medical Council and was re-elected for three further terms He was knighted in 1932 He is survived by his second wife née Amy Florence Sadler, a son and a daughter

JAMES BERNARD MOORE

M B R U I F R C S I

By the death of Mr J B Moore Belfast has lost one of her senior surgeons and the Catholic church in Ireland one of her most energetic lay members He was educated at St Malachy's College Belfast and in 1886 he entered Queen's College, Cork where he gained many distinctions before graduating in medicine with honours In 1909 he obtained the fellowship of the Royal College of Surgeons in Ireland For forty-six years he gave devoted service to the Mater Infirmorum Hospital at Belfast and he held the post of senior surgeon when he died He was also hospital superintendent and secretary to the board of management For many years he was clinical lecturer and examiner in surgery at Queen's University, and he was also a life member of the senate of the university For some years he was an examiner in the Royal College of Surgeons in Ireland During the last war he was surgical specialist to the Victoria Barracks Belfast

His health suffered through his devotion to duty during the air-raids and when his own home was rendered uninhabitable he lived on the hospital premises for some months so that he would always be on the spot in an emergency His friends viewed with concern the deterioration in his health but he insisted on remaining at his post and in the end his death came suddenly He leaves a widow three sons and six daughters

E M H

THOMAS VICTOR SOMERVILLE

D S O, O B E, M C, M R C S, CAPTAIN R A M C

The death of Dr T V Somerville on active service in the Middle East will recall to many listeners a stirring tale broadcast last May by a BBC observer from Sidi Barrani The speaker told how in his "Dingo a two-seater scout car Somerville rode up to the front line and under heavy fire fetched in the wounded to his regimental aid-post and how he amputated a gunner's leg in *the open by the side of his* tank with the shells bursting around For these exploits Somerville was awarded the D S O, and later he was mentioned in dispatches After the evacuation of Crete he was reported missing but a message came through that he was known to be alive though in enemy-occupied territory Later he managed to escape and he was once more serving in Libya when he met his death last November

Born in Ceylon the son of a Scottish planter Somerville was educated at Framlingham He planned to work abroad and before beginning to study medicine he took his M R C V S Lond He qualified M R C S from the London Hospital in 1914 and for a time held a house-appointment at the Royal Sussex Hospital Hastings But he resigned to join the army the day before war was declared in 1914 and he served till 1918 in France and Belgium He was awarded the M C for excused himself from dealing with the larger question of general reform of our social services, which is now under the consideration of the Beveridge Committee Everyone wanted the Determination of Needs Act to work smoothly until more ambitious schemes were brought forward Through its administration over 216 000 persons already in receipt of supplementary pensions had benefited directly by amounts ranging from 2*s* 6*d* or less to over 10*s* The over-all average benefit was 2*s* 9*d* In addition 140,000 new supplementary pensions had been granted to people who either had not applied for them before, or who had failed to get them because of the means test The increased cost of supplementary pensions resulting from the act was estimated at about £5,000 000 a year, of which £1 500,000 was accounted for by the increase in the average rate, and the balance by the increased numbers In April there were 1 240 000 pensioners and 991,000 pensions, whereas in November there were 1,380,000 pensioners and 1,108,000 pensions

QUESTION TIME

Grant to London University

London County Council, as local education authority for London, has decided to reduce by more than a sixth for the duration of the war its prewar grant to London University The fact that in war time conditions London University had been able to effect savings and thus to make considerable additions to its reserves would not, in itself, have been regarded as a ground for reducing the Government grant The maintenance of the grant would have been felt to be justified in view of the heavy immediate expenditure with which the university would be faced after the war and in view of the desirability that the university should have some power of laying its plans in advance The LCC however had taken a different view In view of the importance of maintaining the long standing principle that Government grants to universities were affected by the amount of local support given to the universities, the University Grants Committee had felt obliged, with great regret, to inform the council of London University that the action of the LCC made a reduction of the Treasury grant inevitable The grant would accordingly be reduced, on the advice of the University Grants Committee, by an amount equal to the total reduction made by the LCC, with effect from April 1 next This reduction would not involve any curtailment in the present activities of the university The grant withheld would not be surrendered to the Exchequer but remain in the hands of the University Grants Committee (Sir KINGSLEY WOOD replying to Sir E GRAHAM LITTLE)

Industrial Fatigue and War Production

Mr ELLIS SMITH asked the Minister of Labour if he was aware that, in the view of many experienced industrialists, it was time to consider the effect of three years' continuous long hours on production , what steps were to be taken to deal with the problem , and would he arrange for all workpeople who had been in continuous employment since 1939, and had worked on an average of 52 hours a week or more, to have their hours restricted for a given period in order that they might recuperate and increase output —Mr ERNEST BEVIN replied The effects of long hours on production have been repeatedly considered and the Government have made recommendations on the subject from time to time with good results The Industrial Health Research Board have recently issued another report on the subject Earlier reports of the kind have indicated that proper weekly rests and holidays are of the greatest importance The views of the Government on Sunday work were published last November in the twenty fifth report of the Select Committee on National Expenditure, and the Government issued last month an announcement as to the taking of holidays in 1942 In these circumstances, I do not think that any special steps are necessary at the moment and I am unable to accept the suggestion at the end of the question , but the position will continue to be closely watched Replying further to Mr Smith, Mr BEVIN said that there was complete consultation with all Government departments on this question The Production Executive went over the question with everybody concerned time and time again

Mr RHYS DAVIES In view of the comments made by the Committee on National Expenditure and the Medical Research Council on the amount of fatigue consequent on long hours, has anything been done by the department to implement the recommendations put forward ? Mr BEVIN We work through the Production Executive down to the contractors The last report of the Industrial Health Board referred to optimum hours, which in fact were rather longer than those which I, as Minister of Labour, thought ought to be the optimum hours —Mr A HOPKINSON Is it the policy of the Minister to work on those hours ? No further reply was given

Hours of Work for Young People

Mr RHYS DAVIES asked the Minister if he was aware that the chairman of the local education committee recently stated that many of the 17 year old Huddersfield boys who recently registered were working such long hours that they could not be recommended to join pre service units and that they suffered from exhaustion, mental and physical , and if he would look into the matter —Mr BEVIN replied My attention had not previously been drawn to this statement, and I am making inquiry about it —Mr RHYS DAVIES Is the Minister satisfied that the factory inspectorate are employed on the duties which they are intended to perform in this connexion ?—Mr BEVIN Yes but like every other department of state they have had far greater duties imposed on them as well —Mr KENNETH LINDSAY Is the Minister aware that this is the fourth week in succession that this question has been raised, and on each occasion he has said that it had not been brought to his notice ? Is there not something wrong with the machinery ? Is the Minister aware that yesterday figures were given that in London 400 young people between 17 and 18 are working above the permitted hours ?—Mr BEVIN That was one of the reasons why the Cabinet agreed to the registration of boys and girls, and this is the first time that there has ever been an opportunity of finding out how boys and girls are actually being treated I am getting the information as fast as I can I wish it had been done before —Lady ASTOR If the Minister had asked the mothers they would have told him that boys of that age could not work the hours that they are supposed to work —Mr LINDSAY gave notice that in view of the unsatisfactory nature of the answers he would raise the matter on the adjournment

Rehabilitation Centres for Miners

Mr DAVID ADAMS asked the Secretary for Mines whether he was aware of the high percentage of cures in mining accident cases at the Mansfield centre for rehabilitation , and whether he had considered the establishment of similar centres throughout the coalfields of the country —Mr DAVID GRENFELL I am aware of the excellent work done at the Mansfield centre which is the only one of its kind dealing solely with mining accident cases Another such centre for Durham miners is now being established, towards the cost of which £10,000 or half the total outlay, has been granted by the Miners Welfare Fund Facilities for rehabilitation are also provided at some hospitals in mining areas, and the Miners Welfare Fund have assisted by grants for equipment In so far as miners are prevented from returning to their former occupation they are within the scope of the Ministry of Labour's interim scheme for the training and re settlement of disabled persons —Mr T SMITH Is this not one of the things that ought to be discussed between the miners and mine owners in order that every coalfield might have a similar institution ?—Mr GRENFELL I hope that it will be discussed jointly very soon

Shortage of Nurses

Mr R W SORENSEN asked the Minister of Health whether he was aware that while many hospitals were under staffed at present others were sometimes overstaffed , and whether he would prepare a scheme by which nurses in military or other hospitals who were temporarily surplus to requirement could be loaned for services in hospitals where extra nursing service was needed —Mr BROWN replied I have already drawn the attention of hospital authorities to the desirability of arranging for the transfer of nurses to hospitals which may be under staffed, and my regional officers are making every effort to maintain a proper distribution

Mr B V KIRBY asked the Minister whether he had further considered the representations of the Liverpool city council in which was urged a revision of the rules of the General Nursing Council to enable nurses to take their final examinations in children's diseases and fevers at the ages of 20 and 19, respectively , whether, in view of the serious shortage of student nurses in children's and infectious hospitals, he would lower the age by one year, as a war time measure —Miss F HORSBRUGH replied The General Nursing Council, whom I have consulted, do not consider that the proposed change would be in the interests either of the patients or the nurses

Obituary

HENRY BRITTEN BRACKENBURY

KT MRCS HON MD RUI, LL D WALES

By the death of Sir Henry Brackenbury the medical profession has lost one of its rare statesmen and the general practitioner his stoutest advocate For over thirty years he has been an outstanding figure in medical politics and his work will live after him, for it was the product of an unusually logical mind, one of the finest I have ever known, and an unselfish devotion to the service of the community that only those who were in close contact with him could fully appreciate Brackenbury was a man who would have risen high in any branch of public work It was a lasting regret to many of us that his two attempts to enter Parliament as a Liberal candidate failed, for he would have represented the working medical man in the Commons better than any man I have ever seen there He had already made his mark in municipal affairs and particularly in the educational world when during the Insurance Act struggle from 1911 onwards he, fortunately for us turned his attention to medical politics His record is one of which any man might be proud, as can be seen from the books of reference But my own feelings at the present time apart from those caused by the loss of an old and dear friend, are mainly of deep regret that his wise counsel should be lost to us at this moment, for he remained active with his pen to the very last and was taking a characteristically critical but constructive interest in the proposals for medical planning for the future For him that future had no promise whatever unless it recognised and used to the full the family doctor, of whose position and scope he wrote so wisely in his book ' Patient and Doctor " He inevitably held many chairmanships, but I never thought that he was one of the born chairmen—his brain moved so rapidly and so logically that he was apt to be impatient of slower and less logical people and therefore he was apt to intervene sometimes when it would have been better to give more rope But as a wise counsellor and a master of written and spoken argument he had few equals and no superiors in my time He was not what is generally called a good mixer, but behind a somewhat austere appearance we who saw much of him knew that there was a great fund of kindliness and affection When he was in a fight—which he tried always to avoid if possible by conciliation and reason—there was no more ardent spirit or better strategist and he always earned the respect of those whose views he felt had to be fought I think his greatest personal triumph was the advocacy of the claim of the insurance practitioners for an increased capitation fee before the Court of Arbitration (' Even the ranks of Tuscany could scarce forbear to cheer ") He was warmly complimented by the court and received from the rank and file of the profession a richly deserved testimonial which is unique in my experience and which greatly touched him It is a melancholy but a pious duty to say hail and farewell to one who gave splendid gifts of the mind a high ethical standard and complete unselfishness unreservedly to the service of his profession

Elliott & Fry

A C

Henry Britten Brackenbury was born at Manchester in 1866 son the of Rev Thomas Brackenbury, and was educated at Kingswood School, Bath and Westminster Hospital from which he qualified in 1887 He held a series of hospital appointments in London before settling in general practice in Hornsey, where he stayed until his retirement in 1927 He entered at once into the public life of the borough becoming first chairman of the education committee and then mayor Later, on ceasing to be alderman he was made freeman of the borough He was also a governor of various schools, for girls and for boys, in the neighbourhood He became a member of the BMA Council in 1914 and was chairman of the representative body 1924–27 For the ten preceding years he had been chairman of the Insurance Acts Committee, and as such presented the doctors' case before the court of inquiry on the capitation fee, when the legal member of the court congratulated the medical profession on having so able an advocate We shall he said, have to steel our hearts against being unduly influenced by his pleadings Later Brackenbury recalled his speech as the happiest three-quarters of an hour of his life In 1925 he was elected a direct representative for England on the General Medical Council and was re-elected for three further terms He was knighted in 1932 He is survived by his second wife, nee Amy Florence Sadler, a son and a daughter

JAMES BERNARD MOORE

MB RUI, FRCSI

By the death of Mr J B Moore Belfast has lost one of her senior surgeons and the Catholic church in Ireland one of her most energetic lay members He was educated at St Malachy's College Belfast and in 1886 he entered Queen's College Cork where he gained many distinctions before graduating in medicine with honours In 1909 he obtained the fellowship of the Royal College of Surgeons in Ireland For forty-six years he gave devoted service to the Mater Infirmorum Hospital at Belfast and he held the post of senior surgeon when he died He was also hospital superintendent and secretary to the board of management For many years he was clinical lecturer and examiner in surgery at Queen s University, and he was also a life member of the senate of the university For some years he was an examiner in the Royal College of Surgeons in Ireland During the last war he was surgical specialist to the Victoria Barracks, Belfast

His health suffered through his devotion to duty during the air-raids and when his own home was rendered uninhabitable he lived on the hospital premises for some months so that he would always be on the spot in an emergency His friends viewed with concern the deterioration in his health but he insisted on remaining at his post and in the end his death came suddenly He leaves a widow, three sons and six daughters

E M H

THOMAS VICTOR SOMERVILLE

DSO, OBE, MC, MRCS, CAPTAIN R A M C

The death of Dr T V Somerville on active service in the Middle East will recall to many listeners a stirring tale broadcast last May by a BBC observer from Sidi Barrani The speaker told how in his "Dingo" a two-seater scout car, Somerville rode up to the front line and under heavy fire fetched in the wounded to his regimental aid-post, and how he amputated a gunner's leg in the open by the side of his tank with the shells bursting around For these exploits Somerville was awarded the D S O, and later he was mentioned in dispatches After the evacuation of Crete he was reported missing but a message came through that he was known to be alive though in enemy-occupied territory Later he managed to escape and he was once more serving in Libya when he met his death last November

Born in Ceylon the son of a Scottish planter Somerville was educated at Framlingham He planned to work abroad and before beginning to study medicine he took his M R C V S Lond He qualified M R C S from the London Hospital in 1914 and for a time held a house-appointment at the Royal Sussex Hospital Hastings But he resigned to join the army the day before war was declared in 1914 and he served till 1918 in France and Belgium He was awarded the M C for bravery in 1916 when under heavy fire he crossed the Yser canal to care for some wounded. Later he received a bar for attending in the firing-line to wounded who could not be brought back to his post. In 1918 he went with the expeditionary force to Russia and on his return was appointed O.B.E. After a year as civil surgeon in Bagdad he settled down in general practice, first at Monkseaton in Northumberland and for the last fifteen years at Winton, near Bournemouth. When this war broke out Somerville was already over fifty, but he insisted on joining up at once and his record on active service speaks for itself. He leaves a widow and a married daughter.

JOSEPH FRANCIS O'CARROLL

M.D. R.U.I., F.R.C.P.I.

Dr. Joseph O'Carroll, who died at his home in Dundrum, co. Dublin, on Feb. 18, at the age of eighty-six, was a former president of the Royal College of Physicians of Ireland and professor of medicine at University College, Dublin. He was educated at the Cecilia Street school of medicine in Dublin, and took his L.R.C.P.I. in 1883. He graduated two years later and after post-graduate study in Vienna he proceeded to his doctorate in 1889. The following year he was elected a fellow of the Royal College of Physicians of Ireland and he later filled the offices of examiner and censor in the college. He was elected president in 1916. For over forty years O'Carroll was one of the physicians to the Richmond and Whitworth Hospitals, and he held his chair, to which he was appointed in 1912, for some twenty years. During the last war he served as consulting physician in Ireland to the British Army, and for this work he was awarded the C.B.E., a decoration which he felt constrained to resign later on political grounds. For a time O'Carroll was one of the Lord Chancellor's visitors in lunacy. In his younger days he was one of the pioneers in Ireland of the sanatorium treatment of tuberculosis and he was one of the original visiting staff appointed to the Newcastle Hospital for Consumption, co. Wicklow.

O'Carroll was an excellent clinician and clinical teacher—methodical, conscientious and observant—but he often hedged his statements with cautious qualifications and this fetish of accuracy sometimes gave the unjust impression that his mind moved slowly. For many years he carried on a large consulting practice, and he took an active part in the meetings of the Royal Academy of Medicine. He read widely outside medicine and had a particular interest in modern French literature. Only his friends perhaps appreciated his humour, kindliness and humanity. All respected him as a man and as a physician, but those who knew him well held him in deep affection.

SIDNEY CHARLES HENRY BENT

M.D. BRUX., M.R.C.S.

Dr. Bent's sudden death on March 8 deprived Wandsworth of a popular practitioner. Having qualified from Guy's in 1902 and held resident appointments at the Evelina and the Victoria Hospital, Folkestone, he settled in that borough and practised there for 37 years, with an interval as Capt. R.A.M.C. during the last war. Possessing wide knowledge and shrewd clinical judgment, and blessed with a happy disposition and kindly nature, his practice continued to extend and he became a very busy man, yet he had the faculty of never seeming in a hurry, and was ever ready for a friendly chat. He was a governor of the Bolingbroke Hospital, and many generations of residents can recall his hospitality. Bent had a genius for friendship, writes Z. C., and was beloved by his colleagues and patients. He was fond of sport, was regularly seen at Twickenham and Wimbledon, and in his day was a good tennis and golf player. Yet these were but brief breaks in a life of hard professional work in the populous area in which he lived and from which he refused to move, even in the most intensive air raids of last year. He leaves a widow and a daughter.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export.

Medical News

University of Cambridge

On March 13 the degrees of M.B., B.Chir. were conferred by proxy on P. H. Nash.

Royal College of Surgeons of England

At a meeting of the council of the college held on March 12, with Sir Alfred Webb Johnson, the president, in the chair, Dr. B. D. Pullinger and Mr. R. J. Ludford, D.Sc., members of the scientific staff of the Imperial Cancer Research Fund, were appointed lecturers in 1942.

Diplomas of fellowship were granted to John Marshall Pullan, M.B. Camb., and Michael Vincent Sheehan, M.B. N.U.I., and membership to Audrey Coghlan (West London). The following diplomas were granted jointly with the Royal College of Physicians:—

D.T.M. & H.—L. J. L. Chwatt, O. L. C. Cookson, Adelia A. M. Coutts, D. W. Ellis Jones, A. G. Farr, E. I. Garratt, K. E. A. U. Ground, J. R. Jackson, Charles Michie, I. G. Pattrick, A. R. Sandford, Marion K. Serjeant, J. P. Sexton, Jacques Shah, K. N. Sinha, L. P. Studzinski, and W. J. S. Wilson.

D.O.M.S.—P. H. Beattie, P. C. Bose, E. R. Bowes, David Caplan, G. B. Collver, M. M. I. Enright, H. de B. Kempthorne, Iris M. Magauran, G. C. Pritchard, P. D. Trevor Roper, R. D. Ward and A. L. Wilson.

National University of Ireland

Dr. Edward Keenan has been elected to the chair of anatomy at University College, Dublin, and Dr. Frank Kane to the chair of physiology at University College, Cork. Dr. Vernon O'Hea Cussen has been appointed lecturer in ophthalmology at Cork.

Medical Honours

The George Medal has been awarded to Dr. H. M. Turnbull, medical officer at a works first aid post in Birmingham.

Dr. Turnbull has been on duty during every air-raid on Birmingham. He has shown courage and resolution, and by his skill and resourcefulness many lives have been saved. When the building in which the first aid post is situated was damaged by bombs, the doctor searched for and treated persons buried under wreckage. On several occasions he has treated casualties trapped in wrecked buildings. In order to administer morphia to an injured woman he lowered himself head downwards into a narrow space regardless of the danger from a wall liable to collapse. When an area was evacuated owing to the presence of a time bomb Dr. Turnbull stayed with a woman who was seriously ill until she could be moved with safety.

The M.B.E. has been awarded to Dr. J. A. Macleod of Alnwick for the courage he showed without regard for his own safety during an air raid.

A lone raider dropped bombs on a street, killing seven people and injuring others. A boy was pinned between two floors of a wrecked house which was liable to collapse. Climbing through an upper window, Dr. Macleod found the boy on a floor hanging from the beams and gave him a morphia injection by the light of a pocket torch. The child was then released and passed to the doctor who carried him to safety.

Medical Casualties

T/Major C. H. George, M.R.C.S., has been posted as wounded.

T/Surgeon Lieutenant P. C. Steptoe, M.R.C.S., R.N.V.R., H.M.S. *Hereward*, is reported to be a prisoner of war.

Medical Society of London

At a meeting of this society, to be held at 5 P.M. on Monday, March 23, at 11, Chandos Street, W.1, Surgeon Rear Admiral C. P. G. Wakeley, Mr. R. Vaughan Hudson, and Sir Harold Gillies will open a discussion on the late end results of war burns.

The Children's Bar

The schemes for supplying children with free and cheap milk, cod-liver oil and fruit juices are being merged, and in future all these commodities will be obtainable on one application form renewable twice a year. This new combined form may be had from the local food offices and should be filled in and returned as quickly as possible. Children under five and expectant mothers are eligible for liquid milk—infants under twelve months may take their ration in the form of national dried milk. The age limit for cod-liver oil has now been raised to five and the age limit for fruit juices is two years. From April 1 when the merger comes into force, 10*d*. will be charged for a bottle of cod-liver oil containing six weeks supply, 5*d*. for a bottle of black currant syrup or orange juice (two weeks supply), 2½*d*. for a tin of black currant purée (one week supply). Payment will be made by sticking postage stamps on the coupons before supplies are collected. Children who are getting free milk will continue to receive their cod-liver oil and fruit juices without payment.

Royal Society of Medicine

On Monday, March 26, at 4.30 P.M. at the section of odontology of this society, Captain J. D. King, Ph.D., will read a paper on ulcerative gingivo stomatitis from nutritional and other aspects. At 4.15 P.M., on March 26, the section of urology will hold a clinico pathological meeting. On March 27, at 2.30 P.M. at the section of epidemiology and state medicine there will be a discussion on primary tuberculosis in adolescents and adults. Dr Gregory Kayne and Dr Walter Page are to be the openers. On March 28, at 3 P.M., the section of disease in children will meet at Cell Barnes Hospital, St. Albans.

Research on Blood Diseases

The Lady Tata Memorial Trust is prepared to consider applications from workers in Great Britain for grants or scholarships for research on blood diseases, with special reference to leukæmia. Under present conditions it is not possible to deal with new applications from workers overseas. The awards will be made for the academic year beginning on Oct. 1. Applications should be sent to the secretary of the scientific advisory committee of the trust, c/o London School of Hygiene, Keppel Street, W.C.1, not later than March 31.

Ministry of Health 1939-41

A summary report of the Ministry of Health for the period of April 1, 1939, to Mar. 31, 1941, has just been issued (Cmd. 6340, H.M.S.O., 9*d*.). It contains a brief commentary on the incidence of disease during the earlier war period and an outline of the Ministry's war services. These can hardly serve other than as an aide memoire. But appendices contain the more important of the usual annual statistics and will be found indispensable as a desk companion for the M.O.H. or sanitary authority.

British Homœopathic Association

A prize has been established in memory of the late Dr. Leopold Salzer of Calcutta. It will be offered every third year for the best essay upon the treatment, according to the principles of homœopathy as taught by Hahnemann, of insanity in all its forms. Further information may be had from the secretary of the association, Chalmers House, 43, Russell Square, London, W.C.1.

Typhus on the Continent

According to Dr. Conti, interviewed in Copenhagen, typhus is not likely to become serious in Germany during the war. So far there have been only 126 cases among civilians; he gave no figures for soldiers. There have been many cases in the occupied territories, and in order to prevent lice carrying the disease into Germany from Poland a "louse demarcation" line has been drawn and a regulation made that anyone crossing it from east to west, whether soldier or civilian, must undergo a triple delousing process. In Poland itself the danger from typhus is very great, and anyone with high fever and photophobia is looked on as a suspect. Strict hygienic measures have been imposed, including the provision of delousing stations and baths, but in spite of these a severe epidemic is reported from the Jewish quarters of Miedzyrzecz. The German authorities blame Russian partisans for spreading infection. In the Baltic States measures have been taken for the isolation of infected houses or of whole communities with population up to 50,000. In Lithuania all churches have been closed to prevent the spread of typhus, and bishops and priests who have contravened this German order have been punished by the Archbishop. In Denmark there has been an alarming increase in lice, and a conference of provincial doctors was held in Copenhagen at the end of January to discuss anti-typhus measures. At a meeting of the Berlin Medical Society in December Gellmeister reported that the Weigel typhus vaccine, made from the gut of lice, cannot be produced in adequate quantities. The new vaccine of Otto, Gellmeister and Hagen is easy to produce, but has not yet proved its value in the field. He said it would never be possible to carry out protective inoculation against typhus as extensively as is done against typhoid, and at present only those especially exposed to the danger of infection should be vaccinated.

The Index and title-page to Vol. II, 1941, which was completed with the issue of Dec. 27, is now ready. A copy will be sent gratis to subscribers on receipt of a post card addressed to the Manager of THE LANCET, 7, Adam Street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive indexes regularly as published should do so now.

Notes, Comments and Abstracts

FIRST-AID POST EQUIPMENT

SCHEDULES of authorised equipment at first-aid posts have now been revised by the Ministry of Health (Circular 2578). *Tannic-acid jelly is now being recalled, and first-aiders are now instructed to apply paraffinum molle flavum.* The supplies at posts are now two years old and the jelly has probably started to deteriorate. Tubes and jelly make valuable salvage and authorities are asked to let the senior regional officer know how many they have in stock. Stores of 'Albucid Soluble' (*p*-aminobenzenesulphonacetamide) and of Moorfields eye-droppers issued for treatment of mustard-gas lesions of the eyes, are also being recalled. The work of Pullinger and Mann[1] has shown that *most of these lesions heal of their own accord leaving no corneal opacity.* Liquor antisepticus (liquor chloroxylenol of the National War Formulary) was to have been substituted when supplies of liquor cresolis saponatus ran out, but though the cresol soap supplies are not yet exhausted it has been decided to provide first-aid posts with a small quantity of liquor antisepticus in the meantime. Every post can apply for a pint bottle, and a local reserve of 1½ pints will be maintained for each post after any stores of 'Dettol' or similar antiseptics have been *taken into account.*

Stocks of adhesive plaster are beginning to lose their powers of adhesion, and are to be replaced with plaster packed in sealed tins. Posts are to receive 2 spools instead of 6 and the local reserve for each post is to be reduced from 9 spools to 4. The need for economy is emphasised. Liquid paraffin, for example, is issued to the first-aid posts for external use only, and industrial methylated spirit for skin and instrument preparation; they must not be used for other purposes. Liquor antisepticus can be used for skin preparation; methylated spirit stocks are now reduced to 1 pint for each post. Existing supplies were provided on the basis of 1 gal. per post, and 3 gal. local reserve for each post; these should be adequate for all needs and no arrangements are being made for future supplies.

The regional commissioners have power to approve, where necessary, the provision of light mobile first-aid units to replace or supplement the standard mobile units. The equipment for the light units is set out in the circular and should be drawn, as far as possible, from the authority's local reserve. Where a light unit is to replace one of the standard type the equipment from the standard unit is to be placed in the local reserve. Every public gas-cleansing centre is to be provided with 4 enamelled washing bowls and 2 enamelled jugs. The bowls will be used for washing contaminated hair and for rinsing the anti-gas gloves worn by the staff. The gloved hands will be plunged first in a bowl of bleach paste and then into a bowl of water. Jugs are also to be provided for the gas-cleansing stations of first-aid posts, to fill the eye irrigator cans. Posters showing how to douche eyes are available for display in public gas-cleansing centres and in cleansing depots for civil defence personnel. Liquor iodi mitis and bleach powder are no longer included in the authorised equipment at first-aid posts or upgraded first-aid points.

First-aid posts will normally get supplies, as they need them, from the local reserves of their own authority, but in an emergency when they cannot get into touch with that source, they will be able to get reasonable supplies from any authority with whom they can make touch. Authorities must also be prepared to meet reasonable requests for supplies from Home Guard aid posts.

The DENTISTS REGISTER for 1942 (Constable, 12*s*.) tells us that 335 new names were added to the register in 1941, 87 names were restored (all except one after some technical offence), and 358 names were removed (163 on evidence of death). The total number of names on the register at the end of the year was 15 096, being 64 more than a twelvemonth earlier. The maintenance of so large a figure, if difficult to explain, is none the less welcome.

---

[1] See *Lancet* March 7, p. 296.

ŒSTROGENIC THERAPY

IN his Honyman-Gillespie lecture in Edinburgh on Feb 5 Dr W F T Haultain traced the steps in the discovery of ovarian hormones and the isolation of natural synthetic œstrogens Œstrogens, he said, increase the size and vascularity of the uterus and stimulate the proliferation of the endometrium in preparation for the action of progesterone, their withdrawal causes endometrial bleeding They also augment the spontaneous activity of the uterine and tubal muscle and also the reactivity of the myometrium to oxytocine, and they cause the vagina and vulva to become more vascular and the vaginal epithelium to cornify, they inhibit the activity of the anterior lobe of the pituitary, their withdrawal causes the vasomotor, metabolic and psychical disturbances of the menopause, and in large doses they inhibit lactation, though normally they promote growth of the nipple and the mammary gland The natural œstrogens were first given by mouth, and later, as larger doses were required, in oily solutions parenterally It has been shown that 0 1 mg of œstradiol benzoate when injected, maintains the normal level of œstrogen in the blood for four days and that 0 5–1 mg causes a temporary excess of the œstrogen in the blood, which reaches the normal premenstrual amount on the fourth or fifth day after the injection Nowadays, *however, synthetic œstrogens* can be given in accurate dosage by mouth, and this route is most commonly used Pessaries and ointment are used for local application

Œstrogens have been used with moderate success in girls when menstruation is delayed, to try to stimulate the growth of the uterus and mucosa Administration should be restricted to 10–14 days a month Œstrogens may also benefit dysmenorrhœa due to uterine hypoplasia, 1 5 mg of stilbœstrol daily should be the maximum dose in such cases Œstrogens are also sometimes useful in the treatment of mild secondary amenorrhœa, but they often fail and better results are obtained with anterior pituitary preparations If œstrogens are to be used they should be given only in the postmenstrual and resting phases of the cycle—say in doses of 1 5 mg of stilbœstrol daily from the 10th to the 14th day of the cycle, When the drug is stopped bleeding nearly always follows within 10 days, but further normal periods do not necessarily ensue, because the bleeding is due to withdrawal of the drug and not to the establishment of a normal menstrual cycle The most satisfactory cases to treat are those of delayed menstruation after a confinement Since œstrogens cause proliferation and cornification of the vaginal mucosa, with increased vascularity and resistance to infection, they are useful in kraurosis vulvæ, senile vaginitis, leukoplakia in elderly women, and vulvovaginitis in girls before puberty In cases of senile vaginitis, carcinoma of the body of the uterus should be excluded If the vaginal discharge persists after two weeks treatment or recurs soon after being arrested a diagnostic curettage should be done Attempts have been made to treat premenstrual and menstrual headaches with œstrogens and the results have often been gratifying, small doses, such as 0 1 mg of stilbœstrol given daily for three days before the headache is expected will not interfere with the menstrual cycle Œstrogens are commonly prescribed by the general practitioner to prevent the disturbances characteristic of the menopause, and good results are obtained not only in normal menopausal cases but also in cases of artificially induced menopause Dr Haultain begins treatment about the fifth day after operation, giving 0 5 mg of stilbœstrol dipropionate twice daily, decreasing the dose after three months and usually stopping within six months He does not find that younger patients suffering from surgical menopause require any more intensive treatment than those of menopausal age To inhibit lactation he gives stilbœstrol or triphenylchlorethylene Of 80 patients treated with triphenylchlorethylene, 55 had received one injection of 250–300 mg in 5 c cm of oily solution and in 52 of these complete inhibition was obtained, in no case was there a return of secretion after inhibition He treated 14 cases with one injection of 250 mg dispersed in water, and all these were successful, 11 cases had been treated with 500 mg thrice a day by mouth for two days, and 200 mg thrice a day for two days, again with success in all Lactation was inhibited in 5 of 7 cases given 50 mg of triphenylmethylethylene by mouth thrice a day for two days, twice on the third day and once on the fourth In 22 cases stilbœstrol was given by mouth, 5 mg thrice, thrice, twice and once on four successive days, with inhibition of lactation and no toxic symptoms Encouraging results have also been obtained in cases of chronic mastitis and premenstrual mastalgia

80% OF RECRUITS REQUIRE DENTAL TREATMENT—The inadvertent omission (Feb 28, p 273) of Sir Edward Grigg's actual reference to 80% of *recruits* has given the *impression that* 80% of serving soldiers are in need of treatment and that little or nothing is being done to provide adequate dental care subsequent to enlistment Such, of course, is not the case, as extensive facilities have been provided, both at home and overseas, by *appropriate e*xpansion of the Army Dental Corps and all necessary dental treatment is afforded as a routine

Messrs BRITISH DRUG HOUSES are now making two sulphanilamide pastes containing cod-liver oil, one of medium consistency (aqueous) and the other stiff (containing no water) 'Sulphonamide-P Paste (Medium)' contains 30% of sulphanilamide and 49% cod-liver oil and is mainly intended for application to burns and other surface wounds 'Sulphonamide P Paste (Stiff)' contains 30% of sulphanilamide and 60% of cod-liver oil, it is intended for incorporation into gauze for the packing of deep wounds The pastes are issued in collapsible 4 oz tubes

Appointments

CRUICKSHANK, L G, F R C S I, D P H junior R S O at the Radcliffe Infirmary, Oxford

KITCHIN, C H, L M S S A casualty officer at the Prince of Wales General Hospital, Tottenham, N 15

RANKINE, ADAM, M B GLASG D I H director of medical and health department, Mauritius

SEBASTIAN, J J B, M D OKLAHOMA R S O at Warneford General Hospital, Leamington Spa

TAYLOR, CHARITY, M B LOND M O for H M Prison Holloway

VEITCH, H C C, M R C S examining factory surgeon for St Neots, Huntingdonshire

WADDIE NORMAN M B N Z F R C S R S O at the Radcliffe Infirmary, Oxford

Births, Marriages and Deaths

BIRTHS

BALL—On March 12, in London, the wife of Lieutenant T Donald Ball, R A M C—a son

BEVAN—On March 8, at Great Shelford, Cambridge, the wife of Major Roger Bevan, R A M C—a son

COCHRANE—On March 15, in Edinburgh the wife of Major G G Cochrane, R A M C, of Musselburgh, Midlothian—a son

DARLEY—On March 9, at Esher, the wife of Dr Rupert Darley—a daughter

HAGGIE—On March 8, at Hitchin, the wife of Lieutenant Michael Haggie, R A M C—a daughter

LANKESTER—On March 15 at Weybridge, the wife of Flying Officer A H LANKESTER, M B, R A F V R—a daughter

MACANDREWS—On March 7 in London, the wife of Dr John MacAndrews, of Harley Street, W 1—a daughter

SCOTT—On March 10 at Newcastle on Tyne the wife of Surgeon Lieutenant Ridley Scott, R N V R—a daughter

MARRIAGES

LEHMANN—NORMAN BUTLER—On March 10 at Cambridge, Hermann Lehmann, M D, to Benigna Norman Butler

DEATHS

BENT—On March 8, in London, Sidney Charles Henry Bent, M D BRUX, M R C S

HARLEY—On March 13, in London Richard James Harley, L R C P L, late of Cavendish, Suffolk

PEAKE—On March 10 at Eastchurch Kent Solomon Peake, M R C S formerly of Goldhawk Road, W, aged 83 years

PHILLIPS—On Sunday, March 8, at Torquay, Reginald Kenneth Phillips, M R C S, late of Nigeria

PURDOM—On March 9, at Croydon, Thomas Eadie Purdom, M D EDIN, aged 89

ROBERTSON—On March 8, George Arbuthnot Robertson, M B DURH, formerly of Holmwood

WAYLEN—On March 11, at Devizes, George Swithin Adee Waylen, M R C S, aged 90

WILLIAMS—On March 9, at Hove, David Phillips Williams, M A DUBL, M R C S

WILLIAMSON—On March 8, Charles Frederick Williamson, M R C S, of Horley, Surrey

ARMY PHYSICAL DEVELOPMENT CENTRE

FRANK HOWITT C.V.O.,
M.D. CAMB., F.R.C.P.
COLONEL CONSULTING PHYSICIAN
IN PHYSICAL MEDICINE
TO THE ARMY

ARTHUR WESSON
M.D. LOND., M.R.C.P., F.R.C.S.
COMMAND SPECIALIST IN
PHYSICAL MEDICINE;
MAJOR R.A.M.C.

WITH a view to the more complete utilisation of available man-power, and in an attempt to upgrade the substandard recruit, the Army has instituted a new form of depot known as a Physical Development Centre. It should, however, be noted that before the war there were in existence two Army centres which catered for young recruits who did not attain the statutory physical requirements and who therefore could not be accepted for the Army. The excellent results obtained at these centres are not sufficiently known, although reports on the medical aspect were published in the *Journal of the Royal Army Medical Corps* (vols 68 and 73).

Object of the Present Scheme

This is to hold courses for soldiers whose physical condition is capable of a reasonable degree of improvement in order to enable them to be transferred to higher medical categories than those in which they were previously placed. At present the personnel selected for this purpose is limited to categories A2, B1 and B2, and the age-limit is 35. Medical officers in charge of units make a preliminary recommendation from men of these categories, and command specialists in physical medicine make the final selection. This selection is of the utmost importance as the course is at present limited to two months' duration, and it is therefore necessary that only those likely to show a substantial improvement should be sent. The disabilities found most likely to respond include poor physique due to under-development and malnutrition, abnormalities due to postural, occupational and environmental causes, and local skeletal defects not associated with rigid deformity.

The need for coordinating the medical aspects of remedial and recreational training in this country has long been apparent. The medical profession before the war was alive to the urgent necessity for a closer linkage with those responsible for physical education. The report of the BMA physical education committee (1936), for instance, contained the following recommendations:

> "There should be closer coöperation between the health and the education services, whether central or local, in relation to the physical education of the population."

Unfortunately there was not in existence a national training centre where research into the medical and remedial aspects could be carried out. In schools the physical training was in the hands of teachers who had received the usual instruction included in the teachers' training college course. In factories, physical fitness was left to the generosity of employers with such assistance as they might obtain from voluntary organisations. And in the intermediate and most important period of adolescence, when a man's future is made or marred, nothing was available to the working classes with the exception of evening institutes, certain youth centres, and isolated clubs and organisations which struggled in a parochial way to promote physical fitness.

From the outset of their appointment, specialists in physical medicine have been eager to grasp the golden opportunity of working in the closest touch with the Army Physical Training Corps. This corps has evolved a system of physical training, the result of careful scrutiny of past and existing methods, both British and foreign. It is based on the principle of leadership, combined with an aim to produce a balanced combination of strength, agility and alertness. It is insisted that the mind should control intelligently the development of the body, recognising that on the nature of this control depends the quality of character. A vital atmosphere is thus created, so that thought and enthusiasm regulate action. Training by interest is thus made the key-note of instruction. Staff-instructors of the corps have attended courses of tuition, under command specialists in physical medicine, in the elements of physiology, the principles of *functional anatomy* and the application of active exercises in the treatment of deviations from the normal. On the successful completion of their course these instructors are posted to both military and EMS hospitals and to convalescent depots, so that it has been possible, under medical supervision, to begin the process of active rehabilitation at the earliest possible moment and to maintain continuity throughout the various stages of convalescence until the moment of final hardening has been reached. The corrective and remedial system which was originally evolved for the rehabilitation of convalescent soldiers has been modified to meet the special demands of an Army physical development centre.

The Principles Adopted

The aim of a physical development centre is to improve individual function and performance; therefore a catholic view of physical education is taken and an attempt is made to attack the problem from all aspects.

ATMOSPHERE

A happy atmosphere throughout the centre is essential to success. Perfection in medical and physical treatment will not cure a disability unless reinforced by genuine self-effort on the part of the trainee, who must work in complete harmony with his instructors and with every member of the staff.

The commandant addresses each new intake immediately it arrives and explains the objects of the course and the opportunities offered. He endeavours to make personal contact with the trainees and encourages them to bring to him any personal problem which may serve as a distraction. He lays particular emphasis on team spirit as essential to the success of the centre. Lastly, he addresses the staff at regular intervals and informs them officially of the results which they are achieving, so that even the boiler-man is made to feel that he has an important part to play in the common effort.

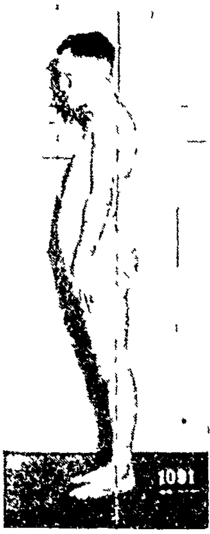
HYGIENE

Fatigue.—Particular attention is paid to the prevention of fatigue. In preparing the daily programme of each group, the periods (which are of 45 min. duration) are arranged so that the more strenuous sessions are alternated with those of a more recreational nature. There is a break in the mid-morning, and trainees relax on their beds for half an hour after the midday meal. Attention is given to the proper use of leisure, when the day's work is done. Experience in athletic training and knowledge of physiological reactions are necessary in order to prevent staleness and boredom. In the prescription of individual treatments, the timing of contraction and relaxation is no less important.

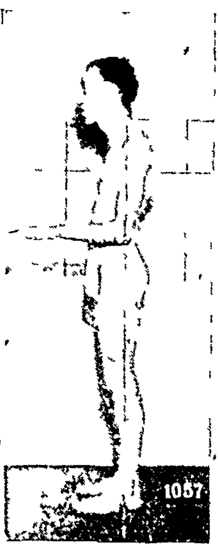
Diet.—No alteration has so far been made, either quantitative or qualitative, to the Army diet, except that a large cup of cocoa and milk is given in the morning break. The calorie value is adequate to meet the demands of the work done, and a liberal supply of fresh vegetables is supplied. Very particular attention is, however, paid to the cooking at the centre, and to the manner in which meals are served. Later, for experimental purposes, it is intended to investigate the effects of increasing the diet, of varying the fat, carbohydrate and protein ratio, and of including vitamin concentrates in selected groups of cases.

Skin-stimulation.—Considerable importance is attached to this. In the open the minimum of clothing is worn; in the gymnasium all work is done in bare feet, and shorts only are worn. Many of the recruits, particularly those of the anæmic, undernourished type and those with catarrhal or mild bronchitic tendencies, derive benefit from a course of actinotherapy. The source used is a powerful carbon-arc lamp yielding a wide spectrum.

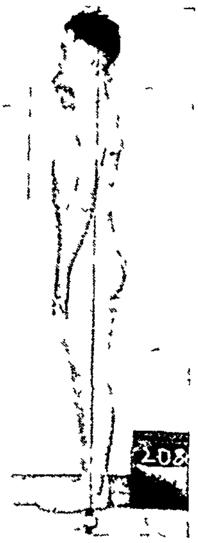
Care of feet.—During the first week of the course there is a boot inspection by the training officer when all misfitting or badly worn boots are replaced. The medical officer sees special cases and refers them to the cobbler with prescriptions for individual alterations. Some trainees have previously been given permission to wear civilian shoes, but no soldier can be classified as A1 who cannot wear an Army boot. The Canadian Army boot, which is of a lighter and softer pattern and has no toe-cap, is being issued to certain of these men.



1—Forward slump



2—Sway back



3—Correct balance

Hyperidrosis, corns, blisters, ingrowing toenails and other abnormalities of the skin and nails are treated by the chiropodist, who also gives instruction in the maintenance of foot hygiene The remedial treatment of flat-foot and other structural disabilities is impossible in the presence of these lesions

PHYSICAL AND RECREATIONAL TRAINING

The physical training is a slightly modified form of the Recruits (1941) PT tables of the Army physical and recreational training manual These tables are based on the physiological effects of muscular exercise on the skeletal, nervous and cardio-respiratory systems, and are arranged in a progressive sequence of energy expenditure The necessary mental stimulus is provided by the inclusion of games of a quickening and coordinating character

The recreational training period is devoted to team games, which serve the dual purpose of improving physique and stimulating mental activity A man will forget a minor disability when playing a game of football, during which he will gain a surprising degree of unconscious movement in his affected joints In the later stages road walks and cross-country runs, alternating with boxing, wrestling and unarmed combat, make that increasing demand on the heart muscle and respiratory system which is essential for complete physical fitness

Remedial Physical Training

This forms the basis of the work at a centre The exercises are designed to counteract the following pathological conditions

(*a*) Disuse muscle atrophy

(*b*) Imbalance between antagonistic muscle groups
  (in both of which the weakened muscles are exercised actively, and their opponents relaxed reciprocally)

(*c*) Limitation of joint movements
  (in which stretching of shortened (contractured) muscles is encouraged by the use of gravity—i e, the body weight)

(*d*) Habitual abnormalities of posture and gait
  (in which normality is achieved by the repetition of corrective exercises)

It has been found, from experience so far gained that the following groups can be differentiated for the purpose of remedial class work into sections of 12–20 men Each member of the section, however, receives additional individual instruction

MALNUTRITION AND UNDER-DEVELOPMENT

In this general group, attention is given to the development of the larger muscle masses—i e, the quadriceps, glutei, erector spinæ, abdominals and shoulder girdle

POSTURAL ABNORMALITIES

Two common types are here illustrated (1) The *forward-slump* (fig 1) showing hyperextended knees, a down-tilted pelvis, lordosis, kyphosis and forward head (2) The *sway-back* (fig 2) in which the weight is carried more on the heels, the knees are flexed, the pelvis is horizontal, there is a long lumbo-thoracic kyphosis, and an acutely forward head

Correction of posture must be made individually, but the final aim is the balancing of body-weight so that no undue tension is thrown on any of the weight-bearing joints and their ligaments and (fig 3) no excessive load is thrown on any one muscle group The habit of correct posture can only be acquired by constant repetition of remedial exercises (fig 4)

FEET

Particular attention has been paid to this large and troublesome group For treatment purposes it has been found helpful to separate cases into two classes

1 *Flat foot*—For these are given (*a*) Active exercises for the calf muscles, tibialis posticus, and intrinsic muscles of the feet (*b*) Exercises and selected games with the object of increasing the range of movement at the ankle and tarsal joints (fig 5) (*c*) Light agility work in order to produce the necessary spring, without which foot function is poor (*d*) Instruction in correct habits of standing and walking which, if not acquired, will probably lead to a return of symptoms

2 *Fore-foot disabilities* consist of (*a*) slight degree of hallux rigidus, (*b*) hyperextension of the metatarso phalangeal joints with metatarsalgia, (*c*) painful conditions associated with faulty weight-bearing In this class, exercises designed to promote mobility of the metatarso phalangeal joints precede normal foot exercises, agility work and re educational walking

Particularly in abnormalities of the foot it is to be noted that the degree of anatomical deformity bears no relationship to the severity of symptoms

OTHER LOCOMOTOR DEFECTS

The most frequent of these are the results of injury to and operation upon the knee It is so frequently emphasised that the quadriceps must be exercised in these cases that the other muscles of the limb are neglected Careful examination will show that the ham-strings are weak and that some degree of wasting of the hip muscles is present with an habitual rotation of the thigh In addition to quadriceps exercises, therefore, active flexion exercises are given for the knee, and flexion, extension, abduction and rotation exercises for the hip Re-educational walking is taught

With the object of restoring normal function, remedial training is completed by including agility exercises in progressive stages Involuntary muscle coordination is thus attained, thereby preventing the recurrence of injury

Physical Treatments

Faradism—A number of cases of local disability are treated by faradism These include weakness of the intrinsic muscles of the feet, and atrophy of the muscles

4—Exercises for spinal curvature

of the upper and lower extremities of traumatic origin In view of their number it has been found necessary to treat similar foot cases in groups, by placing the men in rows with their feet resting on strip electrodes Faradism is a useful accessory treatment in cases of local trauma, but must never usurp the place of active exercise, immediately this becomes practicable

Resisted exercises —Weight and pulley exercises are of value as an additional localised exercise for weakened muscles As E A Nichol recently pointed out (*Brit med J* 1941 i, 501) they can be adjusted for the exercise of any muscle group, and they have the advantage of affording ocular demonstration of improvement as increasing loads are overcome We have found them of particular value in strengthening the calf muscles and inverters of the foot (fig 6)

Constant supervision is essential in all treatments involving muscular contraction in order to ensure that a corresponding period of relaxation ensues Any retrogression is an indication of over-dosage Passive physiotherapy (e g heat and massage) is not usually indicated at a centre

Occupational therapy —As the course is short and the programme full there is little need of occupational therapy of a diversional type There is, however, a workshop in the grounds, and the men are encouraged to make use of this in their spare time or on occasions when treatments are temporarily suspended Crafts of the heavier type such as gardening, carpentry and upholstery are available, and are chosen where possible to meet the needs of any specific defect There is, however no occasion for specialised therapeutic work at a centre

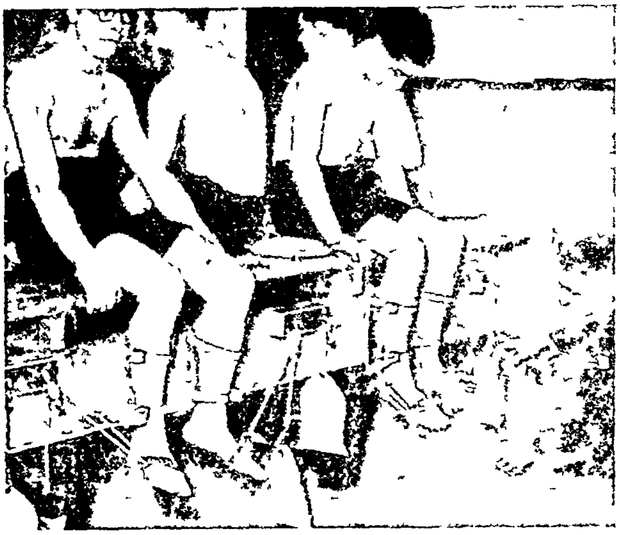
Education —Valuable assistance is given by the Army Education Corps By way of physical relaxation and mental stimulation, one period in every day is taken by sergeant-instructors AEC , the subjects taught, whilst retaining a popular aspect, are chosen with a view to maintaining a continuous service on the man's behalf as a soldier Current affairs, map-reading, mathematics, English and military geography are some of the subjects taught Technical books, discussion groups and debates are provided for the same purpose

5—To increase range at ankle and tarsal joints

The Medical Routine

First examination —On the day following their arrival the men are examined by the specialist in physical medicine and the medical officer to the centre, and are placed into groups according to their disability In addition to the usual medical details, notes are kept as to the specific physical disabilities, and photographs are taken in cases in which these are considered likely to prove of value as a record of progress Individual medical and physical treatments are prescribed The training officer then arranges the men in sections and platoons, each with its own instructor.

Second examination —At the end of the third week a second medical examination takes place with the following objects 1 To return to duty any man whose improvement is not satisfactory. 2 To upgrade any man who is considered already fit for full duty in category A1 (There are approximately 5% in each of these groups) 3 To re-group any trainee who might benefit from alteration in his training programme


6—Weight and pulley exercises

Final examination —As the object of the final medical examination is the re-categorisation of the trainees, it is unfortunate that no physiological or anatomical tests of scientific value exist in the assessment of physical fitness, or in the measurement of physical improvement The subject can volitionally or emotionally, either exaggerate or minimise his improvement These tests are therefore equally at the mercy of the enthusiast the malingerer or the moron

PERFORMANCE TESTS

The *exercise tolerance* test depends upon expenditure of muscular energy in performing a set task, and as one of the objects of physical training is instruction in the economical use of muscular effort, this test as an index of progression, is consequently rendered useless

The estimation of *vital capacity* requires a considerable laboratory conscience moreover, it is not difficult to become a little short of wind or to find a little extra, as the occasion would appear to demand

The *pedograph* will make an excellent print of a completely flat-foot or a marked degree of pes cavus, but the human element will defeat any indication of minor corrections which are precisely those upon which information is required

Anatomical standards and physical measurements are equally misleading, and all these tests have consequently been discarded Therefore, in assessing the final medical category the results of performance throughout the course are given great consideration The following fixed performance tests are accordingly carried out

(a) *Field Tests*

(1) 100 yards sprint
(2) Heaving 16 lb shot
(3) Long jump
(4) Obstacle race

(b) *Physical Efficiency Tests*

(1) Heaving to the beam
(2) Rope climbing
(3) Balance work
(4) Horse and ground work

(c) *Route marches* —These are progressive, both in length and in weight of equipment A march of at least 12 miles in full battle order must be completed without distress before a trainee can be categorised as A1

Progression —These final demands are reached in all instances by a process of steady increase in load, frequency and distance Progression in all physical treatments is a fundamental principle of rehabilitation whether applied to the correction of early deviations or to the remedy of established pathological conditions

Results

The results of the first four courses at the centre (approximately 1000 men) show that 67% were regraded in a higher category than that in which they arrived and that 47% were returned to their units as A1 It is not possible to give exact data concerning the individual disabilities because two or more of these were sometimes present in the same man A rough analysis of the main groups mentioned above is as shown in the table

A follow-up system has been established by which officers commanding units are required to forward reports on the subsequent physical behaviour of the trainees in their new categories It will be interesting to note the permanency of the improvement gained A physical development centre offers a unique opportunity of collecting information regarding any specific disabilities to which various trades and occupations may predispose At the request of the Ministry of Labour, detailed records of the social occupational and environmental histories, together with collateral notes on the medical history at each stage are kept, with a view to obtaining statistics as to any possible correlation

Main groups	Percentage upgraded	Percentage reaching A1
Under development	75	60
Postural abnormalities	65	50
Flat-foot	72	55
Fore foot disabilities	30	20
Other locomotor defects	66	50

SUMMARY

The object, need and aim of a physical development centre are shown The principles of physical re-education are stated The pathology and treatment of certain common physical disabilities are outlined The results, so far obtained, are given

We wish to express our gratitude to Major Frank Davis, commandant, Major Duff Stewart, R A M C, medical officer to the centre, and Captain T Chiltern, supervising officer for physical training, for valuable assistance in preparing this article

---

PROGNOSIS OF MENTAL INSTABILITY

ADOLESCENT AND SERVICE CASES

STEPHEN BARTON HALL
M D LPOOL, D P M
HONORARY PSYCHIATRIST TO LIVERPOOL ROYAL INFIRMARY

MURIEL BARTON HALL
M D LPOOL
CONSULTING PSYCHIATRIST TO THE BOROUGH OF BIRKENHEAD

CONSCRIPTION of man-power to the Services under war-time conditions has revealed a considerable number of recruits on the threshold of adult life who, although physically sound, are unfit by reason of mental infirmity to serve in the Armed Forces Some, detected during routine medical examination by civilian medical boards, are graded accordingly, in many the instability reveals itself only after embodiment

When it is recalled that only a proportion of mentally defective persons in this country are ascertained, that a considerable percentage of the population suffer from psychoneurotic illness, and that the incidence of juvenile delinquency had shown a tendency to increase during the years prior to the outbreak of war, and bearing in mind that in most of these conditions no objective signs are revealed on routine clinical examination, the occurrence of mental instability in the recently conscripted Armed Forces could occasion no surprise Factors affecting the problem also arise directly from circumstances associated with life in the Forces These may make demands on recruits of robust mental make-up but by some are construed as actual mental stresses Among them are the severing of parental and marital relationships, the necessity for adaptation to a communal life that may be characterised by a certain noisiness, roughness and coarseness, the discipline, restriction of liberty, adoption of subordinate rôles, irksome parades and inspections inseparable from Army routine, unaccustomed heavy exertion, and the rigours of enemy action.

But for the outbreak of hostilities within a few months of its being put into operation, the Militia Training Act of 1939 would have afforded a unique opportunity for surveying the physique, capacities and mental and emotional stability of the young manhood of this country, and would have revealed the proportion of youths of 19 who were unfitted by mental weakness or instability to adapt themselves to life in the Forces under peacetime conditions Detailed investigation of such cases in comparison with the well-adjusted might have provided an answer to many social and educational problems arising during childhood and adolescence

INVESTIGATION OF ADOLESCENT PATIENTS

One of us (M B H) has made a study, over a period of years, of more than 1500 young people of both sexes, between the ages of 10 and 20, referred for mental, nervous or allied disorders In addition, an investigation was made before the war of the after-histories of a consecutive series of 317 of these cases, in 88% it was possible to obtain information, based on a follow-up over 5 years, relating to whereabouts, occupation, state of health and adaptation to life, in 156 cases the material was obtained by visits of a social worker to the home, in 95 by letters and reports from official authorities or social organisations, and in 25 by re-examination This inquiry has indicated the forms of mental instability to which young people are prone and the extent to which these states are recoverable In a small proportion it has been possible to include observations on the reaction of the patients to conscription and war service The follow-up investigation was undertaken with two main purposes in view *to determine to what extent the patients had* been capable of satisfactory adaptation to life as revealed by freedom from symptoms and ability to maintain employment, and to determine whether it was possible, at the time of examination, to assess the ultimate prognosis with any degree of accuracy In this paper no attempt is made either to distinguish between those who were interviewed on one or two occasions only and those who were under treatment for a period of weeks, or to discuss the results of treatment

The cases in the series as a whole were considered as belonging to one of four main groups

1 Cases (36% of the total) where the patient was suffering primarily from (*a*) organic cerebral disease, including the organic psychoses, (*b*) mental disorder, including affective, schizophrenic and paranoic disorders, (*c*) any of the different grades of mental deficiency The prognoses in these cases were not difficult to arrive at, were mainly unfavourable and were proved by the follow-up records to have been accurate On their past medical histories, most would not be considered suitable for active service, but those showing mental deficiency included more than 200 feeble minded persons, previously unascertained, who on reaching school leaving age had failed to maintain employment, had been guilty of asocial conduct, or were in moral danger The serious implications both social and legislative of this problem have been dealt with in a previous paper (Barton Hall 1938) There were also a number of high grade relatively stable mental defectives with mental ages (Stanford Revision) ranging from 9 to 11 years, who had been able to maintain themselves in simple routine employment, and some of whom had married and set up homes of their own, in these the defect might readily be overlooked during routine examination by civilian medical boards

2 Cases (32% of the total) where the patient was suffering from one of the psychoneuroses—that is, from mental conflict of pathological significance, manifesting itself primarily in nervous symptoms This group included cases of hysteria, neurasthenia, anxiety, obsessive compulsive and sex neurosis, stammering and enuresis Prognosis was not easy to assess because it depended not only on the severity and duration of the symptoms but to some extent on the facilities for and response to psychological treatment Prognoses proved on the whole to have been accurate Only half of those followed up appeared to have made a complete recovery but a much higher proportion were gainfully employed Although the average age at the time of the 5 year follow up interview was 20 years the patients had shown a pronounced tendency to remain in the parental home Those who had married had remained under the parental roof or in the immediate neighbourhood None had gone to sea, and only 2 (both cases of

stammering) had volunteered for service in the Forc bearing of this finding on conscription hardly needs e Such male members of this group as have reporteo examination since their conscription have invarial stress on the difficulty they experienced in adapting selves to life away from the immediate home circle number of the girls, apparently well adjusted to civili have expressed their inability to face compulsory away from home, and have consequently sought emplo in reserved occupations

3 Cases (31% of the total) where the patient was suf from mental conflict manifesting itself in conduct diso or delinquent acts, many of which had resulted in the pat being brought before the magistrates A favourable p nosis was anticipated in only a third of these cases bu has turned out that this was far too serious a view, two th made a complete recovery This finding is in agreement w the results obtained from an inquiry carried out by the Ho Office in 1933, quoted by East and Hubert (1939), into after-histories of *cases placed on probation* Of 2311 p bationers it was found that rather more than 70% gave sat factory records 3 years after probation had come to an en Of some 8000 children in Home Office approved school 83 5% were "satisfactory" 3 years after leaving schoo In our own series, the average age in this group at the tim of the follow up was again 20 years, nearly all had left th parental home in order to marry, to volunteer for the Services, to seek employment in other areas or to follow a seafaring life The contrast between the delinquent and the psychoneurotic cases in this respect was so noticeable as to suggest a fundamental difference in personality structure between the members of the two groups In many of the cases of conduct disorder in which no improvement had occurred and in which our unfavourable prognosis had been fulfilled, a diagnosis of psychopathic state might well have been made These patients (10% of the whole series) were found to be occupying Borstal, state and public assistance institutions, or H.M Prisons, to be deserters from the Army, to be suffering from tuberculosis, to have contracted venereal disease, or in the case of girls to have given birth to one or more illegitimate children. Almost invariably they were cases with bad heredity, poor constitution both physically and intellectually although not to the extent of being mentally defective within the meaning of the Mental Deficiency Acts

4 Mentally normal people seeking vocational or educational advice (1% of the total)

COMPARISON WITH SERVICE CASES

The information obtained from both the detailed investigation and the after-histories of this series of unstable adolescents has direct bearing on psychiatric problems occurring in Service cases

One of us (S B H) working as part-time psychiatrist attached to an EMS war-neurosis centre, has encountered, in 330 consecutive cases, symptoms ranging from those developing acutely, apparently in direct response to enemy action (e g, the evacuation from Dunkirk or intensive bombing) to those of more gradual onset including cases in which failure had occurred from the outset of service Discussion here is confined to the previously undetected mental defective, the chronic psychoneurotic and the psychopathic personality

The disadvantage of embodying the mentally defective in the modern army has recently been discussed by Esher (1941) It has been pointed out elsewhere (Barton Hall 1941) that there are serious flaws in the application of provisions for ascertainment of mental defect (Education and Mental Deficiency Acts) in the civilian population and also in a system of medical education which allows members of a medical board to pass men so handicapped as suitable for military service It was inevitable that this problem should arise under conscription as the prevalence of the unascertained feeble-minded person in the adolescent series showed

The psychoneurotic cases dealt with here are those occurring in the young soldier What might be designated "Service neurosis" (found in the reservist recalled from remunerative civilian occupation and the ageing soldier confronted by the exigencies of modern warfare) has been excluded Two grades of psychoneurosis are encountered, recoverable and chronic The former are relatively few, and are recoverable in the sense that under treatment the men are rendered capable of being returned to their unit Investigation

stilbœstrol even in small
effects in man, we found
borne during pregnancy
d to be terminated we
intervention and to
of hormones These
of the experimental
after large doses of
c secretion of the
secondarily the
h the future life
ted

ed to hospital
losis compli-
truation on
stage of
1 280 mg
mg by
l bleed-
1941
nued

pital, states that
as feeling well after an interval
, but remarks "we shall often have to be content with partial recovery" These relatively small percentages of carefully selected and treated civilian cases who make a complete recovery under peace-time conditions augurs badly for the prognosis in the unselected young conscript subject to psychoneurotic symptoms who breaks down under war service In 100 cases of psychoneurosis occurring during or after exposure to combatant action, Sutherland (1941) reported only 9% as fit to return to full duty after treatment at a neurosis centre He considered that the personalities of the remainder were structurally so weak and unstable that further combatant service was out of the question In his series 80% admitted to traits indicating previous emotional instability, and he stressed their basically insecure attitude towards the outside world, manifested in excessive dependence on their families, with whom alone they felt secure This observation confirms the findings revealed in the follow-up records of the present series of adolescent psychoneuroses The position was aptly stated in a leading article (*Lancet*, 1940, ii 299), which stated that many more had "broken down with neurotic disorders under the trivial stresses of ordinary army life and separation from the family than under the stresses of violent action" and expressed the opinion that "in the first group the fundamental importance of constitutional weakness and instability as the determining factor could not be missed by the most superficial observer"

Among the psychopathic personalities extreme instances of constitutional weakness and maladaptation to military life were found Maladaptation is used here in a broad sense to include all forms of failure on the part of the personality as a whole, excepting, of course, those due to mental defect and disorder or organic affection It was found possible to differentiate cases into two main types, depending on whether the failure occurred in the form of active offence, displayed as asocial attitude and conduct, or whether the element of constitutional weakness predominated In the former aggressive—even paranoid—trends presented themselves, the patient showing characteristic intolerance of discipline, retaliatory tendencies, overbearing conceit and proneness to self-justification—indeed lack of regard for all but self The latter type was representative of constitutional psychopathic inferiority, the salient feature being that of weakness and general failure to withstand any form of mental or physical stress, much less the eventualities of army life Comparing these two extreme types with those two groups of the adolescent series in which mental conflict manifested itself in either delinquency or psychoneurosis, it is noteworthy that the psychopathic states showed major and constitutional involvement with a corresponding unfavourable prognosis,

in a higher category than that in which they arrive
and that 47% were returned to their units as A1
not possible to give exact data concerning the indi- ore
disabilities because two or more of these were so
present in the same man A rough analysis o
groups mentioned above is as shown in the
A follow-up system has been establis ice patients
officers commanding units are requ ps of cases for
reports on the subsequent physica so far been made
trainees in their new categories , whose intellectual
to note the permanency of th ptible of measurement
A physical development cent d wider ascertainment
tunity of collecting inform er application and stricter
disabilities to which vario ducation Acts, and better
predispose At the re ence by effective coordination
detailed records of t Education and Mental Deficiency
mental histories, t able outdoor care and training for
medical history e stable, and adequate temporary
obtaining stat ment for those who may pass through
stability of mood or behaviour during
Ample provision of permanent institu-
s for the chronically unstable defective is also
The application of such measures, with the
duction of the principle of voluntary treatment,
uld lead to an increased degree of control whereby persons so handicapped would be able to make a better contribution to community life The intelligence should be re-assessed periodically during adolescence and early adult life in terms of mental age, but taking into consideration educational attainment, character development and stability of mood, and on these findings a decision could be made on the qualification of the individual for rights of full citizenship

2 *The chronic psychoneurotic*—Although there is much to suggest that environmental factors operating from birth or from an early age (the unwanted child, the overprotected child the child who is victim of gross parental disagreement) contribute to the disorder, constitutional trends also play a considerable part The modest success claimed for psychotherapy, and its relative failure in the face of the supreme task of inducing the psychoneurotic to accept Service conditions, points to the existence of unyielding factors within the constitution This leads to the conclusion that although from a symptomatic standpoint considerable adjustment may be brought about by treatment, complete recovery —*amounting to the ability to contribute a full and* unrestricted quota to the safety and welfare of the community—must not be expected Many potential psychoneurotics could be recognised during early childhood, when their condition might be found more curable But if symptoms, whether constitutional or environmental, prove resistant to treatment, such people, like those who are physically disabled, might be graded as only capable of giving modified service for example, close to their homes and families and absolved from the controlled regime of military life There might have to be some corresponding restriction of privileges Compulsory national service for not less than one year before reaching the age of 21 would afford opportunity of testing individual capacity for separation from the family and adaptation to communal life

3 *Psychopathic personality*—Except for gross examples, cases of this type are often difficult to ascertain during childhood, and tend to reveal their peculiarities only as the personality matures during late adolescence or early adult life Many are not handicapped by intellectual defect, and institutional or colony training (over and above that already existing for moral defectives under the Mental Deficiency Acts) should be provided for them This should be designed to allow patients to return to community life on terms commensurate with their response to treatment

4 *Delinquent*—Cases in this category from the Services rarely required to be dealt with at a neurosis centre The findings in the adolescent series suggest that were better provision made for children generally during both school and leisure hours, and more particularly for those showing a restless adventurous spirit, the problem of juvenile delinquency could be largely solved

Among the adolescent cases no fundamental difference between the sexes was revealed in the incidence and type of mental instability or in prognosis Thus conscription of women to the Forces can only result in similar problems arising to those already encountered among men, and indeed, experience is already beginning to confirm this

SUMMARY

The prognosis of mental instability is considered in the light of experience gained from (*a*) intensive study of more than 1500 adolescent patients and follow-up records in a consecutive series of 317 of these, and (*b*) detailed psychiatric investigation of 330 Service cases referred to an EMS neurosis centre

An attempt has been made to assess the significance of the problem, from the community standpoint, in four of its main aspects—mental defect, psychoneurosis, psychopathic personality, delinquency The relative seriousness of the problem of psychoneurosis is stressed Whether reaction to mental conflict will take the form of psychoneurosis or of delinquency depends on fundamental differences in personality structure When the reaction takes the form of delinquency the prognosis seems to be more favourable

Our experience had a practical application if the problems which have arisen in connexion with the conscription of men are to be avoided among conscripted women

REFERENCES

Barton Hall, M (1938) *Lancet*, ii, 272
Barton Hall, S (1941) *Brit med J* i 490
East W N and Hubert, W H de B (1939) The Psychological Treatment of Crime, H M Stationery Office, p 15
Esher, F J S (1941) *Brit med J* ii, 187
Harris A (1938) *Ibid*, ii, 649
Luff, M C and Garrod, M (1935) *Ibid*, ii, 54
Neustatter, W L (1935) *Lancet*, i, 796
Ross, T A (1936) Prognosis in the Neuroses London, p 79
Sutherland, J D (1941) *Brit med J* ii 365

THE SALVAGING OF FRACTURE OF THE FEMORAL NECK

ROYAL WHITMAN
M D HARVARD F A C S HON F R C S
HON CONSULTANT TO THE AMERICAN HOSPITAL IN BRITAIN

THE title of this paper becomes apposite since fracture of the femoral neck was officially condemned as a derelict by Sir Astley Cooper, the great authority of his period, in 1823 He contended that "since it was impossible, even for a few hours, to preserve exact apposition of the fragments the surgeon should not be held responsible for a result over which he had so little control" Cooper's pronouncement established the negative standard, which determined the character of the teaching and practice for more than a hundred years The teaching is epitomised in Stimson's treatise on fractures (1910) in the statement "that the first indication is to save life and that the ideal object of treatment—restoration of form and function—is rarely to be attempted or even sought" The practical application of this teaching is presented in Pye's textbook published in 1932 "The patient should be propped up in bed with the limb between sand-bags After about a month, the patient should be encouraged to use the limb as much as possible, since union is not aimed at" It was taken for granted that a broken hip entailed permanent disability In the words of a Victorian authority (Smith 1847), in many instances the injury soon proves fatal, and "no matter whether the fracture has taken place within or external to the capsule, whether it has united by ligament or bone, shortening of the limb and lameness are the inevitable results" Fifty years later Bissell (1903), from a survey of the treatment as conducted in three of the leading hospitals of New York, concludes that "if the patient escapes with his life, he must be contented with loss of function, loss of symmetry and equipoise, even if he is not permanently crippled" The character of the disability is specified in a report on the final results in eighteen cases that had received treatment in a Philadelphia hospital (Wilson 1907) Five of the patients had never attempted to walk, eight used two crutches in locomotion, two used two canes, one a single cane, and one wore a high shoe but walked without support

From this introduction, it will appear that since the negative standard was based on the manifest inadequacy of the means at command to provide the primary essentials of functional repair, the abduction method, which substituted anatomical for artificial mechanics, completely changed the situation For by this means resistant deformity might be corrected and displaced fragments securely apposed with ease and certainty Yet, although the technical efficiency of the anatomical method was physically demonstrable, its application in practice was condemned, not only as dangerous but futile, because of the incapacity of the fragments for repair

Thus the abduction treatment, simply because it was in accord with that of all other fractures, was the exponent of radical reform, and as such it encountered the active opposition of the representatives of the established order and the inertia of stabilised neglect Yet in the lapse of years this treatment, which is comprehensive in its technical scope, and since it requires no special accessories or skilled cooperation is equally comprehensive in its practicability, has come into general use, and it has long since been demonstrated by practical experience that this method, by which infected bedsores and hypostatic congestion of the lungs may be prevented, is the most effective means of *saving life* Furthermore that not only union but restoration of function is attainable in a large proportion of the cases

THE NAILING METHOD

Nailing or spiking the fracture was first described by Nicolaysen in 1897 as the only means of fixing the fragments It was revived in 1921 by Delbet, who substituted a screw for the spike He reported on thirty-five cases, with union in four, a result which, in his experience, had never before been attained (Delbet and Basset 1921) Ten years later Smith-Petersen introduced the open operation, on the logical proposition that, since the capacity for repair had been so amply demonstrated by the abduction method, the percentage of union might be increased by visual adjustment of the fragments and secure fixation by his *flanged nail* (Smith-Petersen, Cave and Van Gorder 1931) The fourth modification of the nailing method is usually credited to Johansson (1932) The fragments are adjusted by anatomical mechanics, and the nail, on a guide, is driven *through the trochanter* under X-ray observation Thus as contrasted with its predecessors, it may be classed as a complement to the abduction method, substituting artificial for natural splinting

This composite procedure has supplanted the open operation, since it is relatively free from danger, and because the percentage of union is much higher than that reported by Smith-Petersen The great and distinctive advantage claimed for it, however, is that it does not require restraint either of the patient or the injury "In a few hours, the patient is ready for a wheeled chair and may at once, if so disposed, enjoy the use of crutches" (Westcott 1932–33) Weight-bearing is permitted or encouraged, or tested by crutch users long before repair is *complete*

This new and most attractive feature of the nailing method is reminiscent of the old teaching, that the patient rather than the fracture should be the first consideration For if one accepts Thomas's conclusion that rest is an *essential factor in* the repair of injury or disease, this fracture would be selected as the typical example for its enforcement, since repair is an interstitial process, therefore slow, precarious and oftentimes incomplete

Banks (1941) has recently reported on nine personal cases of aseptic necrosis of the femoral head after traumatic dislocation, and, has collected thirty-five others from the literature From these he concludes that degenerative changes in the bone may be induced or favoured by the early resumption of activity, consequently, that locomotion should not be permitted for a period of 4–6 months after the injury This conclusion seems to be even more applicable to fracture, in which the nutrition of the head has been directly impaired by the injury and by the insertion of the nail Furthermore, motion of an injured joint is constrained by involuntary muscular *tension*, and if it be combined with weight-bearing, the abnormal pressure and friction on the joint surfaces may predispose to the disintegrating arthritis, now recognised as a not infreqent sequel of united fracture

The criterio stilbœstrol even in small
tion of fun effects in man, we found
symmetrica borne during pregnancy
fragments d to be terminated we
abductio intervention and to
The of hormones These
persis of the experimental
the t after large doses of
at c secretion of the
r secondarily the
ca h the future life
the ted
toward
retained u
advanced ed to hospital
month for re- losis compli-
Weight-bearing is truation on
of extension and a stage of
repair (for details of th 280 mg
Treatment in General P mg by
p 360) Admitting the som bleed-
that the trochanteric cortex ca 1941
in *elderly subjects to support* the nued
of locomotion, it seems hardly cred hyl-
so suppress the sensitiveness of the he
check the tendency toward the prote d
especially since it must be assumed in the w

This observation on the relation of pos function has a very general application, for the most important factor in the disability cause injury, disease or malformation at the hip-joint restricted abduction This was impressed *on me at the* inception of the abduction treatment, which was coincident with the identification of fracture at the hip in childhood, then unrecognised in surgical literature These patients were brought to the hospital for a persistent limp, supposed to be symptomatic of hip disease Fifty years ago the X ray was not available for diagnosis, but the *restriction of abduction* and the elevation of the trochanter indicated depression of the neck of the femur, now known as coxa vara, as the cause of the limp Restoration of the normal angle by cuneiform osteotomy of the shaft removed the obstruction and relieved the disability (see Whitman 1930)

It may be noted that this form of mechanical incongruity is the *most constant cause of failure in operations* of the arthroplastic type, for whenever the neck of the femur is shortened or its angle lessened the range of abduction is correspondingly restricted The reconstruction operation, in which the trochanter is transplanted downward on the shaft to increase the area of bearing surface and restore the leverage of the abductor muscles, is designed *to forestall* this *mechanical* predisposition to deformity

The great merit of intertrochanteric osteotomy for ununited fracture is that the inward displacement of the shaft automatically assures the attitude of abduction Commenting on the shortcomings of the nailing method and the abduction treatment Dawkins (1941) advocates this operation for *fresh fractures*, "*since it will bring* satisfactory results in almost 100% of the cases" His standard is based on utilitarian rather than æsthetic considerations, but it supports the conclusion that the primary object of treatment should be the maintenance of the *range of* abduction and extension essential to symmetry and security in locomotion

* * *

The positive standard has been officially established, and the ideal object of treatment—restoration of form and function—is now attainable From this standpoint, it seems to me that the nailing method fulfils only the first condition, and that the nail should be regarded as a splint rather than a prop, as an introduction to rather than a substitute for efficient protection from pressure and strain during the initial period of repair The resumption of activity should be regulated not by the resistance of the nail but by the competence of the injured joint, as evidenced by the range of voluntary and painless movement Finally, that the relative efficiency of the treatment should be estimated not by the union of the fragments but by the character of the gait, and since this reflects the quality of the aftercare the immediate enjoyment of the use of crutches may be at the expense of both structure and function In

in a higher category thaiomas Browne in his Christian
and that 47% were returay prove Precipitation, de-
not possible to give exactwise cunctation"
disabilities because two
present in the same ma

EFERENCES
groups mentioned abone Jt Surg 23, 753
A follow-up systeid med J 11, 900
officers commandireatise on Dislocations and on Fractures of
reports on the su
Aust N Z J Surg 10, 244
trainees in their , A (1921) Fractures du col de fémur, Paris
to note the per Acta orthopæd scand 3, 362
A physical dev) Nord med Ark 8, 1
gical Handicraft, Bristol
tunity of colle7) Treatise on Fractures, Dublin
disabilities to N, Cave, E F and Van Gorder, G W (1931)
predispose 23, 715
detailed rec(1910) Practical Treatise on Fractures and Disloca-
York
mental hisH (1932) Virg med Mon 59, 197
medical h (1907) Amer J orthop Surg 5, 339
obtaining (1930) Treatise on Orthopædic Surgery, Philadelphia

MINIMAL REQUIREMENTS OF NICOTINIC ACID

WHITE v WHOLEMEAL BREAD

E KODICEK, M D PRAGUE

(Dunn Nutritional Laboratory, University of Cambridge and Medical Research Council)

Elvehjem (1939–40) suggested 25 mg of nicotinic acid as the minimal daily requirement for prevention of pellagra in man This figure seems too high If the nicotinic acid in an average middle-class diet before the war, as recorded by Drummond and Wilbraham (1939) is calculated from values I obtained by chemical estimation (Kodicek 1940), the total figure amounts to about 12 mg per day * Since the incidence of pellagra in Great Britain has been only sporadic (Davies and McGregor 1939), the diet seems to have been adequate to prevent that disease The average nicotinic-acid content of the adult diet under the present rationing system, assuming that the bread taken is wholemeal, is about 12 25 mg per day † A further calculation can be based on the evaluation of vegetarian diets, which are certainly low in nicotinic acid Nevertheless, vegetarians do not often develop pellagra Cramer (1882) studied the food intake of a vegetarian living in perfect health for 11 years From the controlled food intake as reported I have calculated that the subject consumed about 8 2 mg of nicotinic acid per day ‡

If we assume that the minimal daily preventive requirement for man corresponds with that of the dog, which seems (as shown below) to be approximately 280 μg per kg body-weight daily, about 19 mg per day would be needed by a man of 70 kg body-weight The requirement of the dog for dietary essentials per kg is, however, generally greater than that of man For instance, Cowgill (1934) estimates the ratio for aneurine to be 2 8 1 A similar proportion probably applies to the need for nicotinic acid, so that the 19 mg would probably be reduced by at least 50% On the other hand, diets used by Goldberger and Tanner (1925), Goldberger and Wheeler (1929) and Walker and Wheeler (1931) for producing pellagra in human subjects supplied, according to my calculations, 2 4–6 5 mg of nicotinic acid daily An addition of 168 g of salmon (equivalent to 14 1 mg of nicotinic acid) to such a deficient diet completely prevented the onset of pellagra (Schmidt and Sydenstricker 1938) The daily intake of nicotinic acid was thus increased to about 16 5 mg

From all these calculations, the final figure of about 8–16 5 mg (about 0 12–0 24 mg per kg body-weight) emerges as the average daily intake of nicotinic acid which is sufficient to prevent pellagra in man

Doses used for the cure of pellagra are mostly higher, for the response depends on the condition of the patient and on the basal diet which provoked the deficiency The lowest curative dose so far as I am aware was that used by Goldberger and Tanner (1925) They cured pellagrins, subsisting on a deficient diet containing about 2 4 mg of nicotinic acid (calculated) daily, by the addition of 15–30 g of dried brewers' yeast daily, which is equivalent to 6 2–12 4 mg (about 0 1–0 2 mg per kg body-weight) of nicotinic acid Schmidt and Sydenstricker (1938) cured pellagrous conditions in man with 100 mg twice weekly, which is about 0 5 mg of nicotinic acid per kg body-weight per day The doses usually used are at least two or three times greater (Smith et al 1937, 1940) These findings may be compared with the curative doses for the dog I have found that 1 mg of the vitamin daily per kg body-weight caused a rapid improvement, but 0 5 mg per kg body-weight daily was found to be equally effective by Smith and others (1937)

The minimal preventive dose of nicotinic acid for the dog has been calculated by several workers as 0 1–0 13 mg per kg body-weight per day (Margolis et al 1938, Sebrell et al 1938, Birch 1939, Dann and Handler 1941) This figure does not include the nicotinic acid present in the experimental diets According to values I obtained by chemical estimation, the amount of nicotinic acid which a dog obtains from the Goldberger diet, used for the experimental production of black-tongue, is about 0 15 mg per kg body-weight daily The total minimal requirement of the dog will therefore be of the order of 0 28 mg of nicotinic acid per kg body-weight daily

For man, the analyses of average diets justify the assumption that 8–10 mg (about 0 12–0 14 mg per kg body-weight) of nicotinic acid represents the minimal daily requirement, just sufficient to prevent the development of pellagra A lower figure would approach the amounts present in diets known to cause a deficiency

It may be noted that the nicotinic acid of our war-time diet was calculated on the assumption that wholemeal bread, or bread of 85% extraction, is being consumed When white bread is taken instead, the nicotinic acid ingested would fall to the low limit of about 9 mg per day The recent suggestion of an increased incidence of pellagra in Northern Ireland (Deeny 1942) may indicate that the average diet there is becoming unduly low in the pellagra-preventive vitamin Moreover, these calculations do not take into account individual variation in digestion and other factors which may decrease the nicotinic acid available even further and thus cause a "conditioned" deficiency Nor is the deficiency removed by adding aneurine to white flour The difference in the nutritive values of white and wholemeal breads with respect to nicotinic acid may be detected by feeding tests on dogs, rats, however, which have been recently used to compare the nutritive value of wholemeal and white flour (Chick 1941, Wright 1941), will not respond to this particular deficiency, because they do not need nicotinic acid as a dietary essential

The nutritional status of man and the dog can now be satisfactorily evaluated by the procedure proposed by Kodicek and Wang (1941)—that is, to estimate, under standardised conditions, the excretion of nicotinic acid and trigonelline before and after doses of nicotinic amide In deficiency, the "resting levels" of nicotinic acid (Harris and Raymond 1939) and trigonelline are usually reduced, and the response in excretion of trigonelline after doses of nicotinic amide is considerably delayed These findings have recently been confirmed by Perlzweig and others (1941) and Sarett (1942)

CONCLUSION

The minimal requirement of nicotinic acid, sufficient to prevent pellagra in man, is about 8–10 mg per day This amount may not be enough to prevent subdeficiencies, and thus the desirable intake for optimum health may be higher White bread has little nicotinic acid in comparison with wholemeal bread With an average current diet containing white bread the mean daily intake of nicotinic acid is about 9 mg, which is below the desirable limit A diet with wholemeal bread would

---

[*] Calculated from the following data (foodstuffs containing negligible amounts of nicotinic acid are not quoted, the figures in parentheses represent nicotinic acid in mg per g) Average middle class diet (Drummond and Wilbraham 1939) 450 g white bread (2 25), 112 g meat (4 8), 1 egg (0 25), 190 ml milk (0 16) 170 g potatoes (1 7) 112 g cabbage (0 34) 57 g bacon (2 5), 57 g cake (0 3) Total daily nicotinic acid 12 3 mg

[†] Average diet under present rationing system (based on consumption of wholemeal bread) 450 g wholemeal bread (5 4), 64 g meat (2 8), ½ egg (0 13), 200 ml milk (0 16) 200 g potatoes (2), 112 g cabbage (0 34), 16 g bacon (0 69), 57 g cake (0 3), 10 g fish (0 43) Total daily nicotinic acid 12 25 mg

[‡] Average vegetarian diet (Cramer 1882) 1000 ml milk (0 8) 216 g whole rye bread (2 7), 25 g white flour (0 1), 2 eggs (0 5) 300 g potatoes (3), 12 g rice (0 2), 30 g peas (0 6), 10 g oatmeal (0 3) Total daily nicotinic acid 8 2 mg

increase the daily intake of nicotinic acid to about 12 8 mg The substitution of wholemeal or 85% wheatmeal for white bread would thus render the supply adequate A diet low in the vitamin, when taken over a long period, may cause a depletion of the body's reserves of nicotinic acid and under certain conditions result in symptoms of deficiency Attention is drawn to the report of pellagra in Northern Ireland For assessing the level of nutrition in nicotinic acid, measurements may be made of the excretion of nicotinic acid and trigonelline, before and after dosing with nicotinic amide

REFERENCES

Birch, T W (1939) *J Nutrit* 17, 281
Chick, H (1941) *Lancet*, ii, 511
Cramer, T (1882) *Z physiol Chem* 6, 346
Cowgill, G R. (1934) The Human Requirement for Vitamin B, New Haven
Dann, W J and Handler, P (1941) *J Nutrit* 22 409
Davies, J H T and McGregor, H G (1939) *Brit J Dermatol* 51, 51
Deeny, J (1942) *Brit med J* i 157
Drummond J C and Wilbraham, A (1939) The Englishman s Food, London
Elvehjem, C A (1939–40) *Harvey Lect*
Goldberger, J and Tanner, W F (1925) *Publ Hlth Rep Wash*, 40, 54
— and Wheeler G A (1929) *Ibid*, 44, 2769
Harris, L J and Raymond, W D (1939) *Biochem J* 33, 2037
Kodicek, E (1940) *Biochem J* 34, 724
— and Wang, Y L (1941) *Nature Lond* 148 23
Margolis, G, Margolis, L H and Smith, D T (1938) *J Nutrit* 16, 152
Perlzweig W A, Sarett H P and Huff J W (1941) *J biol Chem* 140 proc C
Sarett H P (1942) *J Nutrit* 23 23
Schmidt, H L and Sydenstricker, V P (1938) *J Amer med Ass* 109 2065
Sebrell, W H, Onstott, R H, Fraser, H F and Daft, F S (1938) *J Nutrit* 16 355
Smith, D T, Ruffin, J M and Smith, S G (1937) *J Amer med Ass* 109, 2054
— — — (1940) *J Nutrit* 19, suppl 14
Walker, W P, and Wheeler, G A (1931) *Publ Hlth Rep Wash* 46, 851
Wright, M D (1941) *Brit med J* ii 689

AUTODETOXICATION OF STILBŒSTROL DURING PREGNANCY

BERNHARD ZONDEK, M D YEHUDA M BROMBERG

(From the Gynæcological-Obstetrical Department of the Rothschild Hadassah University Hospital, Jerusalem)

THE synthesis of diethylstilbœstrol by Dodds and his colleagues (1938) has given the clinic and the laboratory a substance with strong œstrogenic powers All the effects of natural œstrone can be reproduced by this new compound Furthermore, it has great advantages in that it can be efficiently given by mouth and its cost is low Since stilbœstrol was introduced clinically a number of toxic effects have been noted Nausea, vomiting, cutaneous and psychic reactions often accompany the administration of this drug Bishop and his colleagues (1939) report side-effects in 6 5% of cases treated with stilbœstrol, and Shorr, Robinson and Papanicolaou (1939) in 80% We have often noted unpleasant side-effects after the administration of small doses (0 5–1 mg) which made it necessary to restrict its clinical use

Œstrogenic hormone rapidly disintegrates in the body (Zondek 1934a) Only 1–2% of the œstrogenic hormone administered to a rat can be found in its body after a few hours The inactivation takes place partly by combination with glycuronic acid, but mostly by enzyme action in the liver (Zondek 1934b) The enzyme is active only inside the liver cells, and the reticulo-endothelial system takes no part in this process (Zondek and Sklow 1941) The hormone esters (œstronebenzoate, œstradiolbenzoate) are much more slowly absorbed than œstrone and œstradiol respectively (Dingemanse and Laqueur 1937) The absorbed portion is, however, immediately inactivated in the liver (Zondek 1934) The position with stilbœstrol is different (Zondek and Sulman 1939), experiments in vitro show that stilbœstrol is not inactivated by liver tissue to the same degree as œstrone In vivo stilbœstrol is absorbed in the same way as hormone esters—that is the absorption follows injection slowly, but the absorbed portion is not completely inactivated in the body, 25% of it being eliminated with the urine whereas œstrone is eliminated only in small amounts in the urine (1–3%, Zondek 1934)

Although as stated above, stilbœstrol even in small doses can give rise to toxic effects in man, we found that very large doses can be borne during pregnancy In 3 women whose pregnancy had to be terminated we attempted to avoid operative intervention and to interrupt pregnancy by means of hormones These attempts were made on the basis of the experimental finding (Zondek 1935, 1936, 1941) *that after large doses of* œstrogenic hormone the gonadotropic secretion of the anterior lobe of the hypophysis, and secondarily the function of the corpus luteum, on which the future life of the young ovum depends, are eliminated

CASE-HISTORIES

CASE 1 —A married woman, aged 24 Admitted to hospital on Dec 19, 1940, with open pulmonary tuberculosis complicated by a seven weeks' pregnancy Last menstruation on Oct 30 Uterine enlargement corresponding to stage of pregnancy. Over six days (Dec 20–25) she received 280 mg of diethylstilbœstrol dipropionate by mouth and 60 mg by injections No toxic effects On Dec 26 slight vaginal bleeding but no abortion Curettage performed on Jan 7, 1941 Menstruation reappeared six weeks *later and continued* normally On April 5 we gave the patient 1 mg of diethylstilbœstrol dipropionate twice daily Three hours after the second dose she was seized with nausea and vomiting and had to go to bed The treatment was interrupted Psychic depression lasting several days followed

CASE 2 —A married woman, aged 27, 10 weeks pregnant, was sent to us *on April 9, 1941, by the mental hospital, for* interruption of pregnancy on account of schizophrenia During 7 days (April 10–16) she received 330 mg of diethylstilbœstrol dipropionate by mouth and 115 mg by injection No signs of intolerance Given treatment with pituitary extract and quinine on the seventh day, but no abortion followed Curettage was performed on April 22 She was seen again six weeks later, on June 3, when she was given 5 mg of diethylstilbœstrol dipropionate daily The first tablet caused severe nausea, which forced us to interrupt this treatment

CASE 3 —A married woman, aged 26, in the eighth week of pregnancy She was sent for termination of pregnancy because of cardiac insufficiency *In her last pregnancy*, two years earlier, she had had acute pulmonary œdema She had a mitral lesion, and on this occasion complained of dyspnœa, and of tenderness of the liver which was enlarged In the course of seven days, she received 270 mg of diethylstilbœstrol dipropionate by mouth and 140 mg of œstradiolbenzoate *by injection On the eighth day we treated her* with pituitary extract and quinine Slight vaginal hæmorrhage followed, but no abortion took place No toxic effects were complained of Curettage was performed on the eighteenth day This patient could not be followed up

CASE 4 —A woman of 27, delivered of a dead child on April 8, 1941 During the first seven days of the puerperium she received 280 mg of diethylstilbœstrol dipropionate by mouth and 60 mg by injection, the aim being to check her milk *secretion No toxic effects were noted and lactation was* inhibited. Menstruation reappeared on June 3 On June 8 she was given 5 mg of diethylstilbœstrol dipropionate and 5 hours later was seized with strong nausea and prolonged vomiting

RESULTS OF TREATMENT

Case	Age (yr)	Disease	Stage of preg (week)	Stilbœstrol during preg or puerp		Side effects	Stilbœstrol after preg or puerp	Side effects
				By mouth (mg)	Inject (mg)		By mouth (mg)	
1	24	Pulm tub	7	280	60	none	2	Nausea vomiting
2	27	Schizophrenia	10	330	115	none	5	Severe nausea
3	26	Mitral stenosis	8	270		none		
4	27	Delivered of dead child	1st wk of puerp	280	60	none	5	Nausea vomiting

DISCUSSION

The results of treatment in these 4 cases are summarised in the table In spite of the fact that we administered enormous doses of diethylstilbœstrol dipropionate both by mouth and parenterally (240–445 mg in five or six days), we were not successful in interrupting pregnancy in any of the 3 pregnant women Perhaps even larger doses must be given in order to eliminate progesterone production completely In 2 women slight bleeding occurred, but this was not followed by uterine contractions, even though we gave pituitary extract and a quinine preparation (Chinin) At the operative termination of pregnancy the placenta showed no signs of separation, but had remained closely attached to the wall of the uterus Surprisingly, the pregnant women did not suffer from any side-effects after these enormous doses of diethylstilbœstrol dipropionate

In case 1, in the course of five days in the seventh week of pregnancy we gave 280 mg of diethylstilbœstrol dipropionate by mouth and injected 60 mg intramuscularly In case 2, we gave even larger doses, so that in the course of six days the patient received 330 mg by mouth and 115 mg diethylstilbœstrol dipropionate intramuscularly In spite of the administration of 445 mg stilbœstrol, there were no side effects of any kind In case 3 we administered 270 mg in the course of six days In case 4, we gave stilbœstrol from the first day of the puerperium over six days, 280 mg by mouth and 60 mg intramuscularly were given without any side effects

Since it was possible that we had lighted upon 4 women who happened to be resistant to enormous doses of stilbœstrol, we gave diethylstilbœstrol again to 3 of these patients some weeks after the separation of the placenta, and after small doses they now showed toxic effects Case 1 had been able to take 170 times as much stilbœstrol during pregnancy as when she was not pregnant, and case 2 could take 90 times as much, case 4, during the puerperium, could take 68 times as much as she could take two months later

SUMMARY

Clinical observations on 4 women show that during pregnancy and the puerperium women can tolerate very large doses (270–445 mg) of diethylstilbœstrol dipropionate without developing side-effects That the women in this series were not resistant to stilbœstrol was proved by the fact that the same women, some months after childbirth reacted to doses of 2–5 mg of the hormone with severe toxic manifestations which made further administration impossible One pregnant woman was able to tolerate about 170 times as much stilbœstrol as when she was not pregnant This proves that a detoxication of stilbœstrol takes place during pregnancy How this detoxication comes about is being investigated

REFERENCES

Bishop, P M F, Boycott, M and Zuckerman S (1939) *Lancet*, i, 5
Dingemanse, E and Laqueur, E (1937) *Amer J Obstet Gynec* 33, 1000
Dodds, E C, Golberg, L, Lawson, W and Robinson, R (1938) *Nature* **141**, 247
Shorr, E, Robinson, F H and Papanicolaou, G N (1939) *J Amer med Ass* **113**, 2312
Zondek, B (1934a) *Lancet*, ii, 356 (1934b) *Skand Arch Physiol* **70**, 133, (1935) Hormone des Ovariums und des Hypophysenvorderlappens, 2, Vienna, pp 499 505, 507, (1936) *Wien klin Wschr* **49**, 455, (1941) Genital Functions and their Hormonal Regulations, Baltimore, p 176
— Sklow, J *Proc Soc exp Biol Med*, N Y (1941) **46**, 276
— Sulman, F *Nature Lond* (1939) **144**, 596
— — and Sklow, J not yet published

STAPHYLOCOCCAL FOOD-POISONING
DUE TO CONTAMINATED SOUP

G C Dorling, F R C S
RESIDENT SURGEON AT HAMMERSMITH (LCC) HOSPITAL
(*Department of Surgery, British Postgraduate Medical School*)

A WOMAN of 61 died within a few minutes of her admission to Hammersmith Hospital She had been living alone in two rooms where she looked after herself doing all her own cooking A week before admission she had suffered from a whitlow of the left thumb At that time she opened and partook of the contents of a tin of tomato soup or mutton broth (the evidence at the inquest was confusing as to which it was) She remained quite well, the thumb gradually healing, until the day before admission when she decided to finish the soup For seven days it had remained in her warm kitchen She warmed it in a saucepan Within three hours of taking it she became violently ill with vomiting and diarrhœa The symptoms of gastro-enteritis increased and she was admitted moribund next day 22 hours after the onset The left thumb was now healing but obviously there had been a severe discharging whitlow Her medical practitioner, Dr Otto Moses, confirmed that she had had a purulent infection of this thumb during the previous week

At autopsy Dr C Keith Simpson found the stomach and intestinal mucosa inflamed throughout, the contents of the entire alimentary tract being thin ochre coloured fluid The thumb was healed The appearances were those of acute bacteriological food-poisoning Samples of the stomach and intestinal contents and also the empty soup tin were examined by Dr F A Knott in the bacteriological department of Guy's Hospital No evidence of the presence of organisms of the salmonella or enteric groups could be found in any of the material tested, but from both the alimentary specimens a vigorous growth of a strongly hæmolytic, coagulase-positive *Staphylococcus aureus* developed, many colonies from the stomach and rather fewer from the intestines Cultures made from the inside of the emptied soup tin also contained colonies of a staphylococcus having the same cultural characters, which corresponded to those of a definitely toxic strain By the time the tin came to be examined air borne and putrefactive contamination had taken place, but the presence of the staphylococcus could be clearly demonstrated

COMMENT

It seems probable that while opening the tin of soup the patient contaminated it with staphylococcal pus from her own thumb For a week in the warm atmosphere of her kitchen the soup acted as a good culture medium for the organisms and when she again partook of it she was in fact drinking a pure culture of staphylococci Within two or three hours she developed gastro-enteritis from which she died

Epidemics of staphylococcal food-poisoning are now well recognised although it is not often that the source of contamination has been traced Kodama and his colleagues[1] reported an outbreak of staphylococcal food-poisoning affecting 110 people in Yokosuka city They had all eaten some fish sausage which had been prepared in a factory two days before by a worker with a suppurative lesion of his hand Wade,[2] reviewing the reports of outbreaks, points out that the infected food was unchanged in appearance, odour and flavour He also mentions two important differences between the staphylococcal type and the salmonella type of food-poisoning In staphylococcal poisoning the incubation period is short (2–4 hours as compared with 6–12 hours in salmonella food-poisoning), and from the staphylococci isolated from this type of food-poisoning may be isolated a bacteria-free filtrate which when swallowed reproduces the symptoms of an acute gastro-enteritis, whereas bacteria-free filtrates from salmonella cultures have been fed in large amounts to humans without producing any symptoms Davison and Dack[3] among others have shown that the staphylococcal enterotoxin is relatively heat-stable This means that ordinary cooking, even if it killed the organisms, may leave the stable enterotoxin to produce gastro-enteritis It is usual to heat but not to boil tinned soup

Suppurative lesions on the hands are common, and doubtless food often gets contaminated without producing gastro-enteritis The hydrochloric acid of the gastric juice is probably well able to deal with a few staphylococci and it is only when a pure culture loaded with enterotoxin is ingested that this natural defence mechanism is insufficient Achlorhydria, from whatever cause, might render a patient more susceptible

SUMMARY

A case is described of acute bacterial food-poisoning due to hæmolytic *Staphylococcus aureus* ingested in soup contaminated a week previously by a suppurative lesion of the patient's thumb

I wish to thank Dr Keith Simpson and Dr Knott for helping to trace the source of infection, and Dr W Allen Daley of the LCC for permission to publish this case

---

[1] Kodama, T, Hata, M Sibuya Y *Kitasato Arch* 1940 17 115
[2] Wade, E M *Nav med Bull Wash* 1938 36 306
[3] Davison E, Dack, G M *J infect Dis* 1939 64, 302

LUMBAR SYMPATHECTOMY IN TREATMENT OF POPLITEAL ANEURYSM

R L RICHARDS
M B ABERD
RESIDENT SURGICAL OFFICER AT A SCOTTISH EMS HOSPITAL

J R LEARMONTH
CH M GLASG, F R C S E
PROFESSOR OF SURGERY, UNIVERSITY OF EDINBURGH, SURGICAL DIRECTOR, S E AREA, EMS SCOTLAND

WE believe that the account which follows provides important evidence of the value of lumbar sympathectomy in maintaining adequate circulation after the resection of a popliteal aneurysm

CASE-HISTORY

A man, aged 32, was admitted to an EMS hospital on July 22, 1941 Three months before he had noted that the veins along the anterior and inner aspects of his right leg were becoming prominent and tortuous, he thought they were varicose veins Two months later he first noted a swelling behind his right knee, which gradually increased in size, and ultimately became pulsatile As the swelling increased he began to feel slight pain behind the right knee and to have a tired feeling in his right leg if he stood for long, otherwise he felt well There was no history of injury to his right leg He had had prominent eyes since birth, and said that his father was similarly affected He denied venereal infection

The patient was unusually tall and rather thin, with bilateral exophthalmos Apart from ptosis on the right side, examination of the central nervous system was negative There was no enlargement of the thyroid gland and no other evidence of thyrotoxicosis The pulse at the wrist was regular and of normal tension, there was no hardening of the radial or superficial temporal arteries, and the retinal vessels did not appear thickened The blood pressure was 132/78 mm Hg His heart and lungs showed no abnormality In the right popliteal fossa, slightly to its medial side, was an aneurysm about 5 cm long, which became much smaller on compression of the femoral artery All movements of the knee joint were unrestricted The superficial veins of the right leg were dilated, more obviously in the external than in the internal saphenous system The pulse was easily felt in the dorsalis pedis and posterior tibial arteries The right leg felt warmer than the left, and accurate observations on temperature * confirmed this impression After exposure of the limbs for 30 min at a room temperature of 21 5° C the temperatures recorded from the right limb were consistently higher than those from corresponding points on the left, the difference was most evident on the great toes, the right being 6° C warmer (fig 1A) A radiogram of the right knee showed some signs of early osteo arthritis Initial Wassermann and precipitation tests were negative, but later the following reports were received Wassermann positive + +, flocculation reaction positive $\frac{1}{8}$, Kahn reaction + 4

The ideal form of treatment would have been excision of the aneurysm, and, with the aid of heparin, restoration of the continuity of the artery by a vein graft, but it was realised that this might prove impracticable Obviously it was desirable that there should be as good a collateral circulation as possible in the affected limb To ensure this, on July 29 right lumbar sympathectomy was performed through an extraperitoneal approach, the chain being removed from the second ganglion to the fourth The patient made an uneventful recovery After this operation the right femoral artery was occluded by digital pressure for 5 minutes three times daily Six days after this operation, the right foot was found to be much warmer than before (fig 1B)

The aneurysm was explored on Aug 21 under spinal anæsthesia, with a tourniquet applied to the upper part of the thigh The popliteal vein was thickened and closely adherent to the sac for a distance of 7 cm It was freed, and the popliteal artery was displayed as it entered the aneurysm, which was of the fusiform type It seemed wisest to treat the condition by excision of the sac The entering popliteal artery was therefore tied in three places, and divided between the distal two ligatures The sac was then dissected from its surroundings, each branch being clipped and tied as it appeared, those identified were the superior medial and middle genicular At the distal end of the sac the popliteal artery was again ligatured, and the aneurysm removed

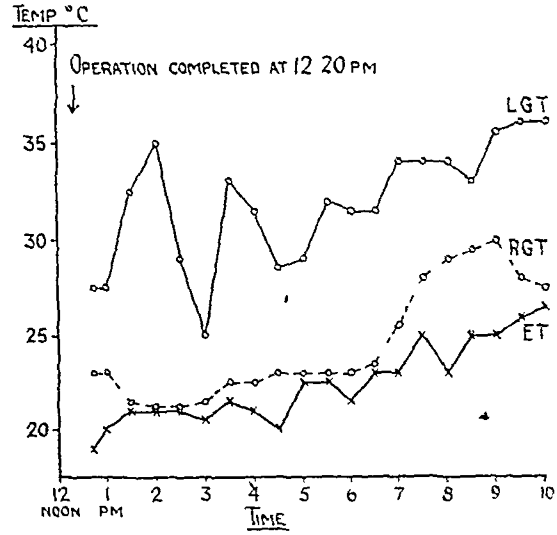


FIG 2—*Postoperative temperature readings after excision of the aneurysm E T, environmental temperature, R G T, right great toe, L G T, left great toe*

For 10 hours after operation records of skin temperature were taken from the great toes (fig 2), after remaining at or near that of the environment for 5 hours, the temperature of the right great toe rose gradually, although it never reached that of the left, which was at full vasodilatation level Twenty-four hours after operation, at an environmental temperature of 21° C, the temperatures were right great toe 33 5° C, left great toe 35 5° C In both lower limbs muscular power and cutaneous sensibility were normal Ten days after operation, after both legs had been exposed

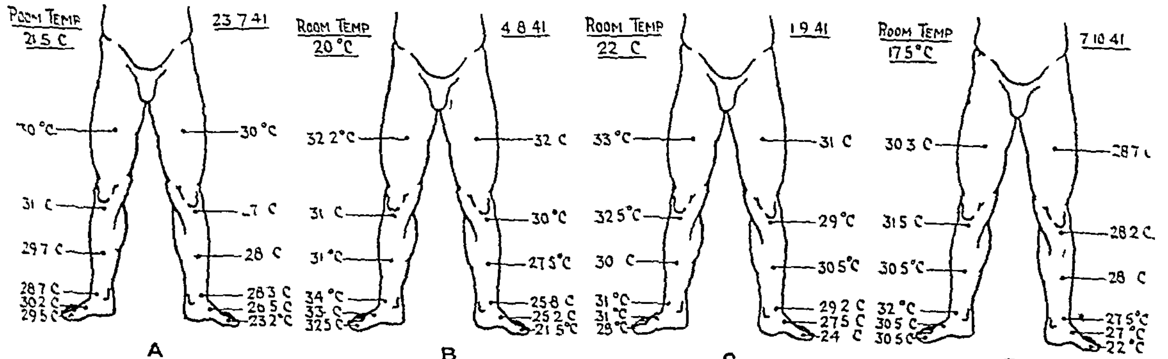


FIG 1—Temperature readings in the legs (A) Before operation (B) Six days after right lumbar sympathectomy (C) Ten days after excision of the aneurysm (D) Forty seven days after excision of the aneurysm

---

* The temperatures were recorded on a standard six couple skin temperature galvanometer supplied by the Cambridge Scientific Instrument Company

DISCUSSION

The results of treatment in these 4 cases are summarised in the table In spite of the fact that we administered enormous doses of diethylstilbœstrol dipropionate both by mouth and parenterally (240–445 mg in five or six days), we were not successful in interrupting pregnancy in any of the 3 pregnant women Perhaps even larger doses must be given in order to eliminate progesterone production completely In 2 women slight bleeding occurred, but this was not followed by uterine contractions, even though we gave pituitary extract and a quinine preparation (Chinin) At the operative termination of pregnancy the placenta showed no signs of separation, but had remained closely attached to the wall of the uterus Surprisingly, the pregnant women did not suffer from any side-effects after these enormous doses of diethylstilbœstrol dipropionate

In case 1, in the course of five days in the seventh week of pregnancy we gave 280 mg of diethylstilbœstrol dipropionate by mouth and injected 60 mg intramuscularly In case 2, we gave even larger doses, so that in the course of six days the patient received 330 mg by mouth and 115 mg diethylstilbœstrol dipropionate intramuscularly In spite of the administration of 445 mg stilbœstrol, there were no side effects of any kind In case 3 we administered 270 mg in the course of six days In case 4, we gave stilbœstrol from the first day of the puerperium over six days, 280 mg by mouth and 60 mg intramuscularly were given without any side effects

Since it was possible that we had lighted upon 4 women who happened to be resistant to enormous doses of stilbœstrol, we gave diethylstilbœstrol again to 3 of these patients some weeks after the separation of the placenta, and after small doses they now showed toxic effects Case 1 had been able to take 170 times as much stilbœstrol during pregnancy as when she was not pregnant, and case 2 could take 90 times as much, case 4, during the puerperium, could take 68 times as much as she could take two months later

SUMMARY

Clinical observations on 4 women show that during pregnancy and the puerperium women can tolerate very large doses (270–445 mg) of diethylstilbœstrol dipropionate without developing side-effects That the women in this series were not resistant to stilbœstrol was proved by the fact that the same women, some months after childbirth, reacted to doses of 2–5 mg of the hormone with severe toxic manifestations which made further administration impossible One pregnant woman was able to tolerate about 170 times as much stilbœstrol as when she was not pregnant This proves that a detoxication of stilbœstrol takes place during pregnancy How this detoxication comes about is being investigated

REFERENCES

Bishop, P M F, Boycott, M and Zuckerman, S (1939) *Lancet*, i, 5
Dingemanse, E and Laqueur, E (1937) *Amer J Obstet. Gynec* 33, 1000
Dodds, E C, Golberg, L, Lawson, W and Robinson, R (1938) *Nature*, **141**, 247
Shorr, E, Robinson, F. H and Papanicolaou, G N (1939) *J Amer med Ass* **113**, 2312
Zondek, B (1934a) *Lancet*, ii, 356, (1934b) *Skand Arch Physiol* **70**, 133, (1935) Hormone des Ovariums und des Hypophysenvorderlappens, 2, Vienna pp 499 505, 507, (1936) *Wien klin Wschr* 49, 455, (1941) Genital Functions and their Hormonal Regulations, Baltimore, p 176
— Sklow, J *Proc Soc exp Biol Med*, *N F* (1941) 46, 276
— Sulman, F *Nature Lond* (1939) **144**, 596
— — and Sklow, J not yet published

STAPHYLOCOCCAL FOOD-POISONING
DUE TO CONTAMINATED SOUP

G C DORLING, F R C S
RESIDENT SURGEON AT HAMMERSMITH (LCC) HOSPITAL
(Department of Surgery, British Postgraduate Medical School)

A WOMAN of 61 died within a few minutes of her admission to Hammersmith Hospital She had been living alone in two rooms where she looked after herself doing all her own cooking A week before admission she had suffered from a whitlow of the left thumb At that time she opened and partook of the contents of a tin of tomato soup or mutton broth (the evidence at the inquest was confusing as to which it was) She remained quite well, the thumb gradually healing, until the day before admission when she decided to finish the soup For seven days it had remained in her warm kitchen She warmed it in a saucepan Within three hours of taking it she became violently ill with vomiting and diarrhœa The symptoms of gastro-enteritis increased and she was admitted moribund next day 22 hours after the onset The left thumb was now healing but obviously there had been a severe discharging whitlow Her medical practitioner, Dr Otto Moses, confirmed that she had had a purulent infection of this thumb during the previous week

At autopsy Dr C Keith Simpson found the stomach and intestinal mucosa inflamed throughout, the contents of the entire alimentary tract being thin ochre coloured fluid The thumb was healed The appearances were those of acute bacteriological food-poisoning Samples of the stomach and intestinal contents and also the empty soup tin were examined by Dr F A Knott in the bacteriological department of Guy's Hospital No evidence of the presence of organisms of the salmonella or enteric groups could be found in any of the material tested, but from both the alimentary specimens a vigorous growth of a strongly hæmolytic, coagulase positive *Staphylococcus aureus* developed, many colonies from the stomach and rather fewer from the intestines Cultures made from the inside of the emptied soup tin also contained colonies of a staphylococcus having the same cultural characters, which corresponded to those of a definitely toxic strain By the time the tin came to be examined air borne and putrefactive contamination had taken place, but the presence of the staphylococcus could be clearly demonstrated

COMMENT

It seems probable that while opening the tin of soup the patient contaminated it with staphylococcal pus from her own thumb For a week in the warm atmosphere of her kitchen the soup acted as a good culture medium for the organisms and when she again partook of it she was in fact drinking a pure culture of staphylococci Within two or three hours she developed gastro-enteritis from which she died

Epidemics of staphylococcal food-poisoning are now well recognised although it is not often that the source of contamination has been traced Kodama and his colleagues[1] reported an outbreak of staphylococcal food-poisoning affecting 110 people in Yokosuka city They had all eaten some fish sausage which ha   n prepared in a factory two days before by a worker with a suppurative lesion of his hand Wade,[2] reviewing the reports of outbreaks, points out that the infected food was unchanged in appearance, odour and flavour He also mentions two important differences between the staphylococcal type and the salmonella type of food-poisoning In staphylococcal poisoning the incubation period is short (2–4 hours as compared with 6–12 hours in salmonella food-poisoning), and from the staphylococci isolated from this type of food-poisoning may be isolated a bacteria-free filtrate which when swallowed reproduces the symptoms of an acute gastro-enteritis, whereas bacteria-free filtrates from salmonella cultures have been fed in large amounts to humans without producing any symptoms Davison and Dack[3] among others have shown that the staphylococcal enterotoxin is relatively heat-stable This means that ordinary cooking, even if it killed the organisms, may leave the stable enterotoxin to produce gastro-enteritis It is usual to heat but not to boil tinned soup

Suppurative lesions on the hands are common, and doubtless food often gets contaminated without producing gastro-enteritis The hydrochloric acid of the gastric juice is probably well able to deal with a few staphylococci and it is *only* when a pure culture loaded with enterotoxin is ingested that this natural defence mechanism is insufficient Achlorhydria, from whatever cause, might render a patient more susceptible

SUMMARY

A case is described of acute bacterial food-poisoning due to hæmolytic *Staphylococcus aureus* ingested in soup contaminated a week previously by a suppurative lesion of the patient's thumb

I wish to thank Dr Keith Simpson and Dr Knott for helping to trace the source of infection, and Dr W Allen Daley of the LCC for permission to publish this case

---

[1] Kodama, T Hata M Sibuya Y *Kitasato Arch* 1940 17, 115
[2] Wade, E M *Nav med Bull Wash* 1938 36 306
[3] Davison, E, Dack, G M *J infect Dis* 1939, 64, 302

seemed to be any impairment of vision, the examination of his discs was however quite impossible

Since all investigations had proved negative and we still thought the origin of the condition was a suprarenal tumour, a laparotomy was performed on April 12, 1941 Both kidneys and suprarenals were palpated and found to be normal Next day the child died suddenly and at autopsy he was found to have a well-demarcated tumour about the size of a walnut arising in the left corpus mamillare (fig 2) There was considerable œdema of the brain, the pituitary appeared to be normal, nor was there any obvious abnormality in testes or suprarenals The tumour was kindly examined by Dr W Susman of Manchester University, who reported that it was an astrocytoma originating in the left corpus mamillare

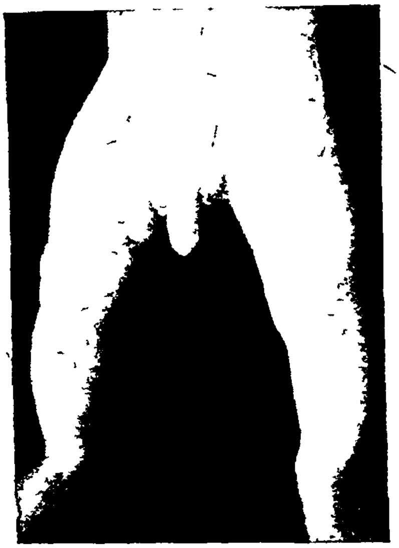


FIG 1—External genitalia of adult proportions

DISCUSSION

The most interesting aspect of this case is the highly selective manifestation of the tumour The child was physically well developed and in advance of his age, but his good development would have called for no comment apart from the astonishing size of his external genitalia In fact the only obvious manifestation of any abnormality was the genital hypertrophy There seemed to be no increased physiological activity, no erections were noticed and he displayed no interest in his genitalia It is true that an odd pubic hair was present, but hair growth on his head was extremely good

The examination of the urine showed that there was no increased output of male hormone According to Gesting and Webster (1938) the daily output of androgens increases from about 3 I U at 3 years to about 15–20 I U at 14 years Nathanson, Towne and Aub (1939) found that the mean excretion per day in a boy of 6 years was 6 5 I U of male hormones Dr Greenwood concluded that the result obtained in this patient was what one would expect in a child of 2 years, and as the urine was extremely stale on arrival it is possible that the actual male-hormone content was slightly higher than the figure given

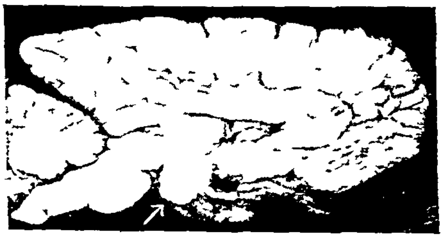


FIG 2—Longitudinal section through brain, showing tumour (arrow) of left corpus mamillare

In tumours of the testis and suprarenal it seems that external genital hypertrophy occurs in response to an increased physiological activity which probably stimulates the hypothalamus in the region of the mamillary nuclei This case suggests that in these nuclei there is a separate centre which controls the development of the external genitalia and that when this region is stimulated by tumour formation hypertrophy of the genitalia occurs as an isolated and primary manifestation, apart from any increased physiological activity.

Biologically, structure subserves function Normally, it seems, the pituitary controls somatic and sexual development, and these processes are closely interconnected Physiological development is apparently exerted by pituitary influences over suprarenals and gonads, whereas anatomical development depends on a fine interplay between the pituitary and portions of the hypothalamus In this particular case it is possible that the tumour stimulated the mamillary nuclei, or alternatively it may have inhibited a mamillary control over the pituitary or a pituitary influence over the mamillary nuclei There must also normally be a delicate control exerted between general somatic and genital development which in this case was out of gear, and it is interesting to reflect that in most cases of acromegaly there is considerable external genital hypoplasia

SUMMARY

In a boy of 1 year 7 months, with great genital hypertrophy, there was no evidence either clinical or biochemical of any increased sexual physiological activity The cause was an astrocytoma of the left corpus mamillare

There is probably a centre in the region of the mamillary nuclei which is responsible for genital development, and this is probably under pituitary control

REFERENCES

Dott, N (1939) quoted in Recent Advances in Neurology, London And personal communication
Fraser, I (1940) *Brit J Surg* 27, 521
Cesting R B and Webster, B (1938) *Endocrinology* 22, 307
Nathanson, I T, Towne, L E and Aub, J C (1939) *Ibid*, 24, 335
Sutherland, D M (1932) *Brit J Surg* 20, 343

MEDICINE AND THE LAW

Prospective Evidence of Insanity

IN R *v* Trevor, an appeal heard on Feb 23, the convicted man's counsel asked for time in which to search for evidence tending to establish his client's defence of insanity Only that morning, he said, his client had informed him of circumstances dating back to 1893 which might justify the calling of fresh evidence on the appeal The Court of Criminal Appeal has statutory power to admit fresh evidence which was not before the jury at the trial and, after hearing such evidence, to quash the conviction This power it is, in practice, most reluctant to use It has seldom allowed the production on appeal of evidence which could have been produced in the court below The accused is never encouraged to hold back a witness at the trial and then tender him before the appellate tribunal In R *v* Tellett (1921) the Court of Criminal Appeal refused to hear evidence of insanity when the issue of insanity had not been raised at the trial Defending counsel must often face the dilemma of choosing between a denial of the facts and an admission coupled with a plea of insanity These alternatives are not easily reconciled and the courts do not care to see the one defence adopted at assizes and the other on appeal The recent decision in Trevor's case, where the application for time for inquiry was refused, seems to show that, if the accused's counsel pleads insanity (and thus undertakes the onus of proof) he must put all the available evidence before the trial court He will not be assisted with subsequent facilities to conduct a roving search into past history where the prospect of success is uncertain

---

FAITH, HOPE AND THE CHARITIES YEAR BOOK —Charity is said to begin at home, but to be effective it must sometimes venture abroad and in planning these expeditions there is no better guide book than the Annual Register of Charities published by the Charity Organisation Society (London Longmans Green, pp 488, 8s 6*d*) The 1942 edition is as helpful as ever and lives up to its boast that it is "indispensable for the service of persons in all kinds of trouble and need" The sections on war organisations and on refugees will be useful in coping with topical troubles

THE INDEX and title-page to Vol II, 1941, which was completed with the issue of Dec 27, is now ready A copy will be sent gratis to subscribers on receipt of a post card addressed to the Manager of THE LANCET, 7, Adam Street, Adelphi, W C 2 Subscribers who have not already indicated their desire to receive indexes regularly as published should do so now to room temperature for 30 min , the right leg was warmer than the left, the difference being 4° C in the great toes (fig 1c) In the absence of the popliteal artery and three of its five collateral branches, this finding was somewhat surprising, but it showed the adequacy of the collateral circulation Repeated observations showed that the temperature of the right great toe varied between 27° C and 30° C , without relation to the environment

The patient remained in bed for 14 days after the second operation On getting up he found his knee rather stiff at first, but within a day or two this wore off, and his only complaint was of tingling and some pins and needles on the dorsum of his right foot, most definite when he lay down again At no time did he have pain in the muscles of his right calf, nor did frequent measurements of the circumference of the calf reveal any wasting The pulses in the dorsalis pedis and posterior tibial arteries have not returned (Oct 29, 1941), but the patient walks well without the slightest trace of a limp for distances of over a mile, and the foot does not swell after exercise The dilated veins, though still visible, are much less prominent The right foot is warmer than the left (fig 1D)

DISCUSSION

The finding of increased warmth in a limb distal to the site of an aneurysm is unusual Theis (1937) recorded the skin temperatures of the great toes in five cases of popliteal aneurysm, and found reduced peripheral temperatures on the affected side, in one case by as much as 5° C He stressed the relationship between the oscillations at the site of the aneurysm and the vasomotor changes distal to it, and pointed out that as the amplitude of the oscillations at the aneurysmal site decreased there was a corresponding improvement in the peripheral circulation, with an increase in surface temperature In none of his cases, however, was the surface temperature on the affected side higher than that of the normal If Theis is correct in postulating that arterial pressure is partially expended in dilating the sac, thus reducing peripheral blood-flow and producing lower peripheral temperatures, what explanation can be offered for the increased warmth in the present case ? Our patient is a young man with a healthy and resilient vascular tree, while the ages of the cases recorded by Theis ranged from 46 to 80 years of age It would be possible for a collateral circulation to develop, to compensate for the reduced peripheral blood-flow resulting from the presence of the aneurysm , superficial vessels would contribute to this From the appearance of the aneurysm gradual occlusion of the sac had been proceeding for some time, which would favour the development of a good collateral circulation

An experimental basis for the performance of lumbar sympathectomy before proceeding to the ligation of the main artery in a lower limb is to be found in the work of Mulvihill and Harvey (1931), which showed that the fall in peripheral temperature after ligation of the external iliac artery in the dog could be immediately overcome by the removal of the ipsilateral lumbar sympathetic ganglia In man a case of aneurysm of the popliteal artery successfully treated by lumbar sympathectomy followed by obliterative endoaneurysmorrhaphy has been reported by Bird (1935) More recently in a series of cases suffering from various types of peripheral vascular disease and treated by preganglionic lumbar sympathectomy White and Smithwick (1941) have mentioned a case of bilateral popliteal aneurysm in which the circulation was improved by sympathectomy

A study of the collateral circulation by means of repeated records of skin temperature does not appear to have been made before, and we believe that our findings provide further evidence that the sympathectomised lower limb minus the popliteal artery and certain of its branches has an adequate collateral circulation This is sufficient to maintain a constant surface temperature which is higher than the normal, and we hope that in later life it will help to protect the limb from the danger of vascular insufficiency

SUMMARY

In a case of popliteal aneurysm in a young man the collateral circulation in the limb distal to the aneurysm was excellent

The condition was successfully treated by lumbar sympathectomy, followed by resection of the aneurysm

We consider that before an aneurysm is resected, at least in young subjects, sympathectomy should be performed

We wish to thank Dr Reginald Bailey, medical superintendent of the hospital, Dr W G Clark, medical officer of health for Edinburgh, and Dr Andrew Davidson, chief medical officer to the Department of Health for Scotland, for permission to publish this case One of us (J R L) receives a grant for expenses from the Medical Research Council

REFERENCES

Bird, C E (1935) *Surg Gynec Obstet* 60, 926
Mulvihill, D A , Harvey, S C 1(931) *J clin Invest* 10, 423
Theis, F V *(1937) Surgery, 2, 327*
White, J C , Smithwick, R H (1941) The Autonomic Nervous System, New York

---

EXTERNAL GENITAL HYPERTROPHY IN INFANCY

HENRY POSTON
M CH BELF , F R C S E
ORTHOPÆDIC SURGEON TO BOUNDARY PARK GENERAL HOSPITAL, AND TO ROYAL INFIRMARY, OLDHAM

A H BARBER
M B BIRM , M R C P , F R C S
VISITING SURGEON TO BOUNDARY PARK GENERAL HOSPITAL

CASES of external genital hypertrophy are relatively rare and when they occur they are associated with lesions in one of three situations the suprarenals, the testes or the pituitary-hypothalamic region They are usually associated with a considerable increase of sexuality and general muscular development and have been described as cases of pubertas præcox or macrogenitosomia Sutherland (1932) described a case of the latter condition in a boy aged 11, due to a tumour of the interstitial cells of the right testis , and more recently Fraser (1940) recorded a case of precocious sexuality in a child of one year, due to a tumour of the right suprarenal

The influence of the hypothalamus on sexual development is probably exerted in many cases through its influence on the hormones of the pituitary A lesion in this part of the brain may produce genital atrophy which is usually accompanied by obesity On the other hand, sexual precocity may result from a lesion of the hypothalamus and such a case was reported by Dott (1939) in a girl with an astrocytoma in the floor of the third ventricle The case to be described is one of considerable external genital hypertrophy together with some increased bodily development in which there appeared to be no increased sexual physiological activity

CASE-HISTORY

A boy was first seen at an orthopædic clinic with slight bowing of the legs at the age of 1 year 7 months It was noticed that his genitalia were much larger than normal, and he was admitted to Boundary Park Hospital for further investigation During the next 11 months he remained in hospital under close observation He appeared to be a mental defective He was never able to speak but constantly made loud terrifying noises and behaved like an animal His habits were filthy and he would eat his fæces No abdominal tumour was palpable and on X ray examination nothing abnormal was detected either in the abdomen or in the skull The pituitary fossa appeared to be normal Apart from the genitalia, which were of adult proportion (fig 1), there was nothing physically abnormal It was still thought that there was probably a suprarenal tumour present and an attempt was made to collect sufficient urine for an estimation of its androgenic index Since this required at least 5 litres it was no easy task for the nursing staff, as the child had no sphincter control When the estimation was at last performed, by Mr Alan Greenwood, D Sc , of Edinburgh, to our surprise the urine contained less than 1 international unit of androgen per litre The boy's skeletal development was considerably in advance of his age, and an X ray examination of the hands showed that all the ossific centres for the carpus except that for the pisiform had appeared at 2 years 3 months, whereas six centres are not usually seen until 6 years For a week in October, 1940, he had a series of fits and these should have suggested that the lesion was intracranial Each fit lasted for about 2 min It started with twitchings and choreic movements, the child became cyanosed, the eyes rolled upwards and after more twitching movements he settled down to sleep There never seemed to be any impairment of vision, the examination of his discs was however quite impossible

Since all investigations had proved negative and we still thought the origin of the condition was a suprarenal tumour, a laparotomy was performed on April 12, 1941 Both kidneys and suprarenals were palpated and found to be normal Next day the child died suddenly and at autopsy he was found to have a well-demarcated tumour about the size of a walnut arising in the left corpus mamillare (fig 2) There was considerable œdema of the brain, the pituitary appeared to be normal, nor was there any obvious abnormality in testes or suprarenals The tumour was kindly examined by Dr W Susman of Manchester University, who reported that it was an astrocytoma originating in the left corpus mamillare

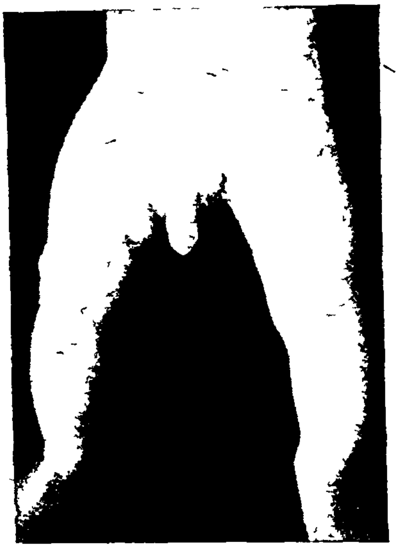


FIG 1—External genitalia of adult proportions

DISCUSSION

The most interesting aspect of this case is the highly selective manifestation of the tumour The child was physically well developed and in advance of his age, but his good development would have called for no comment apart from the astonishing size of his external genitalia In fact the only obvious manifestation of any abnormality was the genital hypertrophy There seemed to be no increased physiological activity, no erections were noticed and he displayed no interest in his genitalia It is true that an odd pubic hair was present, but hair growth on his head was extremely good

The examination of the urine showed that there was no increased output of male hormone According to Gesting and Webster (1938) the daily output of androgens increases from about 3 I U at 3 years to about 15–20 I U at 14 years Nathanson, Towne and Aub (1939) found that the mean excretion per day in a boy of 6 years was 6 5 I U of male hormones Dr Greenwood concluded that the result obtained in this patient was what one would expect in a child of 2 years, and as the urine was extremely stale on arrival it is possible that the actual male-hormone content was slightly higher than the figure given

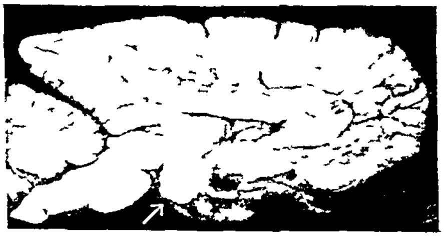


FIG 2—Longitudinal section through brain, showing tumour (arrow) of left corpus mamillare

In tumours of the testis and suprarenal it seems that external genital hypertrophy occurs in response to an increased physiological activity which probably stimulates the hypothalamus in the region of the mamillary nuclei This case suggests that in these nuclei there is a separate centre which controls the development of the external genitalia and that when this region is stimulated by tumour formation hypertrophy of the genitalia occurs as an isolated and primary manifestation, apart from any increased physiological activity

Biologically, structure subserves function Normally, it seems, the pituitary controls somatic and sexual development, and these processes are closely interconnected Physiological development is apparently exerted by pituitary influences over suprarenals and gonads, whereas anatomical development depends on a fine interplay between the pituitary and portions of the hypothalamus In this particular case it is possible that the tumour stimulated the mamillary nuclei, or alternatively it may have inhibited a mamillary control over the pituitary or a pituitary influence over the mamillary nuclei There must also normally be a delicate control exerted between general somatic and genital development which in this case was out of gear, and it is interesting to reflect that in most cases of acromegaly there is considerable external genital hypoplasia

SUMMARY

In a boy of 1 year 7 months, with great genital hypertrophy, there was no evidence either clinical or biochemical of any increased sexual physiological activity The cause was an astrocytoma of the left corpus mamillare

There is probably a centre in the region of the mamillary nuclei which is responsible for genital development, and this is probably under pituitary control

REFERENCES

Dott, N (1939) quoted in Recent Advances in Neurology, London And personal communication
Fraser, I (1940) *Brit J Surg* 27, 521
Gesting R B and Webster, B (1938) *Endocrinology* 22, 307
Nathanson, I T Towne, L E and Aub, J C (1939) *Ibid*, 24, 335
Sutherland, D M (1932) *Brit J Surg* 20, 343

MEDICINE AND THE LAW

Prospective Evidence of Insanity

IN R *v* Trevor, an appeal heard on Feb 23, the convicted man's counsel asked for time in which to search for evidence tending to establish his client's defence of insanity Only that morning, he said, his client had informed him of circumstances dating back to 1893 which might justify the calling of fresh evidence on the appeal The Court of Criminal Appeal has statutory power to admit fresh evidence which was not before the jury at the trial and, after hearing such evidence, to quash the conviction This power it is, in practice, most reluctant to use It has seldom allowed the production on appeal of evidence which could have been produced in the court below The accused is never encouraged to hold back a witness at the trial and then tender him before the appellate tribunal In R *v* Tellett (1921) the Court of Criminal Appeal refused to hear evidence of insanity when the issue of insanity had not been raised at the trial Defending counsel must often face the dilemma of choosing between a denial of the facts and an admission coupled with a plea of insanity These alternatives are not easily reconciled and the courts do not care to see the one defence adopted at assizes and the other on appeal The recent decision in Trevor's case, where the application for time for inquiry was refused, seems to show that, if the accused's counsel pleads insanity (and thus undertakes the onus of proof) he must put all the available evidence before the trial court He will not be assisted with subsequent facilities to conduct a roving search into past history where the prospect of success is uncertain

---

FAITH, HOPE AND THE CHARITIES YEAR BOOK—Charity is said to begin at home, but to be effective it must sometimes venture abroad and in planning these expeditions there is no better guide book than the Annual Register of Charities published by the Charity Organisation Society (London Longmans Green, pp 488, 8s 6*d*) The 1942 edition is as helpful as ever and lives up to its boast that it is " indispensable for the service of persons in all kinds of trouble and need " The sections on war organisations and on refugees will be useful in coping with topical troubles

THE INDEX and title-page to Vol II, 1941, which was completed with the issue of Dec 27, is now ready A copy will be sent gratis to subscribers on receipt of a post card addressed to the Manager of THE LANCET, 7, Adam Street, Adelphi, W C 2 Subscribers who have not already indicated their desire to receive indexes regularly as published should do so now

Reviews of Books

The Mask of Sanity

HERVEY CLECKLEY B A Oxfd M D Georgia, professor of neuropsychiatry University of Georgia London Henry Kimpton Pp 298 15*s*

THERE has been much less written about psychopathic personality than about other psychiatric conditions, despite its social importance Schneider Kahn, and Henderson have each devoted a monograph to it, the first mainly concerned with description, the second with characterological interpretation, and the third with psychobiology and social adjustment Dr Cleckley's useful book aims to include all these approaches He devotes half of it to well-told case histories, unfortunately they are all of men, so that the reader might conclude that psychopathic personality is a masculine disorder exhibited by drunken wastrels and blackguards This is a considerable defect If his study had taken account of women with psychopathic personality he would perhaps have seen more clearly the difficulty of delimiting it, as he proposes, from other morbid types of personality, especially the hysterical and the schizoid The difficulty is, however fairly plain in some of the male cases reported The bias due to this exclusively male clinical material pervades the book, it is only in the brief discussion of psychopathic characters in fiction that two or three women are mentioned—among them, fantastically enough, Zuleika Dobson! The interpretative half of the book is interesting but woolly The problems of treatment and the protection of society are examined with much honesty and common sense, psycho-analytic explanations are tentatively advanced, and the term "semantic dementia"—an unfortunate choice because of the proper meaning of dementia—is suggested to denote the particular maladaptation and superficially purposeless behaviour of the group of people described They stand midway between the legal delinquent and the mentally ill, a position nowise indicated by such a question-begging term as semantic dementia No-one, however can read this book without appreciating the peculiar nature of the problem they offer in our social structure

Modern Therapeutics

Editors Sir HUMPHRY ROLLESTON, Bt, M D Camb, ALAN A MONCRIEFF M D Lond London Eyre and Spottiswoode Pp 365 16*s*

THIS collection of papers, originally published in the *Practitioner*, possesses most of the virtues and some of the vices of all such compendia Introduced by one of the late Prof A J Clark's able expositions of "pharmacology for the intelligent doctor," it ranges from Dr G M Findlay's brilliant and successful attempt to provide a simple yet balanced account of the metallic compounds (arsenic antimony mercury and gold) within the space of 11 pages, through Professor Wayne's clever example of verbal fencing over counter-irritants and counter-irritation to Dr R A. Young's frankly empirical treatment of expectorants and linctuses Then there is Professor Browning's rather uncritical summary of of various clinical reports on the inestimable advantages of euflavine and its allied derivatives, Dr Woolley's attempt to deal with antipyretics in a detached scientific spirit, and the achievement of Professor Charteris in compressing into a chapter on tonics such a motley collection as bitters iron, and digitalis The main defect of many chapters is the sacrifice of critical approach entailed in the attempt to be impartial and all-embracing But comprehensive clear and reliable, this skilled summary of therapeutics should prove a boon to the busy practitioner

Hippocratic Medicine

Its Spirit and Method WILLIAM ARTHUR HEIDEL, London Humphrey Milford, Oxford University Press Pp 149 13*s* 6*d*

MOST of us have a very hazy knowledge of the history of medicine Too often in school histories the development of ideas is obscured by kings and dates and the history of medicine is often sterilised in like manner Names of eminent medical men (usually attached to diseases or structures) stand out from the past like wartime signposts, indicating that there is a road but not saying where it leads Thus, though we all acknowledge Hippocrates to be the Father of Medicine, few could explain why this high honour is justified Professor Heidel's book makes the reason clear by describing the development of Greek science and philosophy in the fifth century B C and showing that many ideas formulated by the Hippocratic school have been incorporated into medical teaching because of their fundamental truth

The rapid development of detailed scientific technique in recent years has obscured for many doctors the basic principles of the scientific method, they have not been able to see the wood for the trees But as Aristotle says, the better educated and inquiring physicians discuss the philosophy of nature and derive their principles from it, and the most gifted philosophers always in the end lead up to the principles of medicine Professor Heidel was a classical scholar and he had a profound knowledge of his period—indeed it almost seems that he must have been H P to Hippocrates at Harvard His book is erudite and he rather takes it for granted that the reader knows Anaxagoras from Anaximenes, so that it is not exactly suited to the busy practitioner, though he perhaps would get most profit from it

Diseases of the Nose, Throat and Ear

(2nd ed) I SIMSON HALL, M B Edin, F R C P E, F R C S E Edinburgh E and S Livingstone Pp 446 15*s*

Mr Simson Hall's own experience of general practice convinced him that a competent knowledge of diseases of nose, throat and ear is an essential equipment for practice Hence this small but compendious handbook for students and practitioners whose appreciation of the author's clear and definite teaching and of the soundness of his advice has resulted in an early call for a second edition In the preface to this edition he claims that he has been able to introduce new material without increasing the bulk of the book by omitting "portions which have proved of less value" But as we were constrained to point out before, his account of common diseases would have gained in accuracy by being fuller, it is not always possible to give a fair picture of a complex pathological process or its treatment in a few lines This is illustrated in the passage on diphtheria where he states "Diagnosis is made by means of a swab" As it stands this is unsound teaching for the student who should be aware that the diagnosis of diphtheria is made by clinical examination and confirmed by the swab—and it is no good going on to say that treatment consists in the administration of antitoxin "at the earliest possible moment" if the context implies that this moment will not come until the organism has grown on a culture medium True the author concedes that a small dose of antitoxin should be given in doubtful cases, but the advice is inadequate as it stands Later, under motor neuroses, he mentions that paralysis of the soft palate is frequently encountered as a sequel to diphtheria, but he omits to warn the student that any patient in whom fluids return through the nose should be laid flat forthwith and kept flat or he may drop dead

Year Book of General Surgery, 1941

Editor EVARTS A GRAHAM M D Chicago The Year Book Publishers, London H K Lewis Pp 768 16*s* 6*d*

WE are accustomed to Professor Graham's masterly annual review of the progress of surgery The present volume is even more critically selective—and so more valuable—than its forerunners Every contribution of note during the past year seems to have received attention, those particularly worthy are referred to in an introduction However voracious a reader a surgeon may be he is sure to overlook some important paper during the year and to forget the details of lesser contributions By this book his memory will be revived and he is likely to be introduced to any papers he has missed, besides, it is an entertaining volume to read at ease in an armchair and the numerous editorial comments are always illuminating

---

NELSON LOOSE-LEAF BOOKS —The price of the new volume on "Administrative Medicine" in this series, which was reviewed in our last issue (p 356), is $7 50 The 1941 renewal pages together with the new second volume binder for "Diagnostic Roentgenology" (*Lancet*, March 14 p 324) cost $10 50 and the complete [illegible] volume set $25

THE LANCET

LONDON SATURDAY MARCH 28 1942

FACE-MASKS

In a radio talk the Chief Medical Officer to the Ministry of Health has animadverted on the ill-mannered folk who broadcast their coughs and sneezes in buses, tubes and other public places and we may yet see this unsocial habit become as rare as spitting now is, for the public sneeze coming usually from someone with a respiratory infection, is, with its infective droplets of varying size more likely to spread infection than the public spit The sneeze can be aborted by firm pressure on the upper part of the nose or the man-in-the-tube can prevent its dissemination by the use of a large-sized handkerchief for the lady it may not be so easy, and the genteel hand over the mouth is a poor substitute In hospital the nurse and doctor attending to patients must have their hands free and may require at material times to wear an efficient mask if they are to guard against the risk of spreading infection to susceptible tissues But what is an efficient mask and when should it be worn ?

Opinion is divided between an impermeable mask and one that acts as a bacterial filter without impeding air-flow The popular mask in this country is one of simple design consisting of two or more layers of gauze with a piece of cellulose acetate or stout paper between the layers [1] Such a mask covering both nose and mouth, is probably effective if worn for short periods but after a time becomes uncomfortable, moist and messy An alternative form of impermeable mask is one moulded in cellulose acetate with a spectacle frame or other device to hold it in position and this is comfortable and efficient if the wearer is in an upright position but is not very suitable if he has to bend over patients A large supply of a simple type of cellulose acetate mask [2] is being held in store for use in air-raid shelters or other public places in times of an epidemic of influenza or other highly infectious respiratory disease a more elaborate type like the Maskon is useful for those engaged in blood-supply work and the like These masks are designed primarily to prevent the direct spray of droplets to near neighbours or to contaminable fluids like blood and serum but their impermeability and lack of close fitting may mean that fine droplets—the droplet-nuclei of modern parlance—will escape into the air and carry infection elsewhere Further the wearer is not protected against the risk of infection from droplet-nuclei or infected dust In America **Arnold** [3] suggested the use of a mask which would act as a bacterial filter without impeding air-flow In testing various materials including silk cotton-gauze and linen he found that wood cellulose in the form of a crêped wadding called 'Cellucotton' has a strong adsorbing action on bacteria and he recommended a mask of this material between layers of coarse gauze His suggestion has lately been put to rigorous experimental test by **Rooks Cralley** and **Barnes** [4] who confirmed that cellucotton was the most efficient bacterial filter and the least obstructive to air-flow but it had practical disadvantages for use as a face-mask because of its friability Using cotton-gauze of varying porosity, they discovered that repeated laundering improved its efficiency as a bacterial filter and they recommended a six-layer gauze mask (42 × 42 strands to an inch) as having after twenty launderings a 97% bacterial filtering capacity and a relatively low resistance to air-flow A mask of this material made with a snout like the Cestra or the model in the MRC memo on hospital infection [5] therefore seems to be the most generally useful for hospital wear

As to when they should be worn there will be general agreement that nurses handling infants should wear masks, and that doctors and nurses at operations whether in the theatre or in the labour room or dressing an open wound in the ward should be masked or if not should refrain from talking [6] Similarly any doctor or nurse who must continue on duty while suffering from a cold or sore throat should be efficiently masked particularly when attending young children or those suffering from diseases prone to secondary infections like measles or influenza But must the nurse and doctor attending patients with scarlet fever or diphtheria or cerebrospinal fever wear masks for their own protection or to prevent the spread of infection ? And does wearing a mask increase local susceptibility to infection by causing congestion of mucous membranes ? To these and other questions there is yet no definite answer

LUTEOTROPHIC HORMONE

In 1907 **Loeb** demonstrated that trauma of the rabbit s uterus led to the formation of endometrial growths resembling the placenta and that these placentomas could only be produced during the luteal phase of the reproductive cycle **Long** and **Evans** [7] later showed that such growths could not be produced in normal rats presumably owing to the shortness of the œstrous cycle, but were readily produced during lactation and pseudopregnancy that is at times when active corpora lutea were present in the ovary **Astwood** [8] then obtained placentomas in ovariectomised rats by mechanical stimulation of the uterus and simultaneous injection of progesterone It is therefore clear that placentoma formation is an indication that functional corpora lutea are present in the ovaries and that they are secreting progesterone In the rat pseudopregnancy which is produced after sterile mating or by electrical stimulation of the cervix uteri lasts for 12–14 days, after which the corpora lutea degenerate and the normal œstrous cycles are resumed This maintenance of functional corpora lutea for 12–14 days is probably due to the influence of the pituitary since hypophysectomy terminates true pregnancy if performed during the first 10–11 days but has no effect on the pregnancy if performed later Therefore some extrapituitary influence must be responsible for the maintenance of the functioning corpora lutea in the latter part of pregnancy, and indirect evidence suggested that the placenta was the responsible organ **Astwood** and

Greep[9] produced direct evidence that this is so They found that placentomas could not be produced in pseudo-pregnant rats if the pituitary was removed at the same time as the uterus was traumatised, but when injections of extracts of rat placenta were started at the time of the hypophysectomy placentomas were readily formed The active extracts also produced pseudopregnancy when injected into normal rats Having thus proved the existence of luteotrophic activity in placental extracts, the next step has been to demonstrate similar activity in pituitary extracts and to isolate relatively pure fractions

Evans and his colleagues[10] have tried to provoke placentomas in normal and hypophysectomised rats by threading pieces of silk through the uterus half way through a course of injections of various pituitary extracts Rat pituitary implants gave positive results but the workers were unsuccessful when they used a variety of gonadotrophic extracts, including chorionic gonadotrophin, pregnant mare's serum gonadotrophin, and follicle-stimulating and interstitial-cell-stimulating pituitary fractions They then made the surprising observation that lactogenic preparations were active, deciduomas being produced by injections of this extract in 9 out of 12 normal rats and in 10 out of 12 hypophysectomised rats, the failures in both cases were obtained with the lowest doses used Tests showed that the pituitary lactogenic extract used, which was prepared by the method of Lyons[11] and was homogeneous by electrophoretic tests, was free from detectable gonadotrophic activity, it produced no increase in ovarian weight in immature female rats when injected in the highest dose used in the placentoma experiments, nor did it augment the gonadotrophic action of chorionic or serum gonadotrophin or follicle-stimulating hormone prepared from pituitary glands The action must be mediated through the ovary, since it was abolished by ovariectomy and histological evidence points to some action of the preparation on the corpora lutea The experiments were performed on adult hypophysectomised rats in which the corpora lutea present persist for some weeks after the operation In the treated rats the atrophy of the follicles and interstitial fluid had not been prevented but the corpora lutea appeared unusually healthy It was also found that placentomas could not be produced if the injections of lactogenic hormone were delayed until 11 days after operation but were again produced at this time if corpora lutea were produced by suitable gonadotrophin injections The effect was also produced in adrenalectomised rats, so that it is unlikely to be due to contamination with adrenocorticotrophic hormone, which is also found to be active

The failure to produce placentomas with gonadotrophic extracts may be due to the œstrogen whose secretion they stimulate, since œstrogens are known to inhibit placentoma formation[8] This factor has been taken into account by Astwood,[12] who has devised a different test for luteotrophic activity He injects immature female rats with chorionic gonadotrophin and when œstrus results starts a series of œstrogen injections sufficient to maintain œstrus in ovariectomised rats In the presence of the corpora lutea produced by the gonadotrophin, however, there follows a period of diœstrus owing to the mucifying effect of the secreted progesterone on the vaginal mucosa (similar to that in pregnancy) This diœstrous period lasts 13–29 days in spite of continued œstrogen injection At the end of this period the corpora lutea degenerate and œstrus reappears But if the pituitary is removed on the second day of diœstrus œstrus reappears within 96 hours, owing to the degeneration of the corpora lutea Luteotrophic extracts are tested on these hypophysectomised animals, the injections are started immediately the pituitary is removed and if the extract is active the reappearance of œstrus is delayed Astwood finds that gonadotrophic or thyreotrophic pituitary extracts are inactive but that other extracts are active These active extracts exhibit lactogenic and adrenocorticotrophic activity, and one was prepared by Lyons's method for prolactin, but Astwood does not yet identify what he terms luteotrophin with prolactin The American workers have certainly provided strong evidence of luteotrophic activity and also that "luteotrophin" plays a physiological rôle in the body Cutuly[13] has provided other evidence that this is so by producing successful implantation in rats hypophysectomised 1–5 days after mating and injected daily with prolactin, 2 out of 10 went successfully to term, pregnancy being interrupted in the remainder at 6–17 days Luteotrophic hormone therefore appears at present to be an accurate term since the factor does not cause luteinisation of the follicles, nor apparently does it stimulate ovarian growth—it really does seem to nourish the corpora lutea, and Astwood finds that his extracts are inactive if the initial injection is delayed more than 20–30 hours after hypophysectomy when the corpora lutea have already begun to degenerate That the luteotrophic and prolactin hormones are identical remains to be confirmed, but there has been one report[14] that the placenta contains large quantities of prolactin

CORONARY DISEASE

The classical manifestations of coronary disease—angina pectoris and coronary thrombosis—seldom present any diagnostic difficulties The major problem today is the recognition of the atypical cases, those in which early diagnosis may make effective prophylaxis possible and those where sudden death is liable to occur As an aid to diagnosis various tests have been introduced including the response of the heart, as indicated by electrocardiographic changes or the onset of pain, to exercise, adrenaline and anoxæmia But the objections to these are considerable In the first place pain is such a subjective phenomenon that its occurrence under artificial conditions is too variable to be reliable Further the risk to life, and certainly to health, from these tests is by no means negligible, particularly with adrenaline which for this reason has now been given up Even the electrocardiographic changes evoked give us useful information in only a small percentage of cases Of recen years the induction of anoxæmia as a test for coronar disease has been fully investigated, and, while worker such as **Levy** and his colleagues[1] claim that with adequate precautions such patients can breathe a mixture containing 10% of oxygen without risk there is evidence that unfortunate incidents do occur, and the value of such tests is problematical

---

[9] Astwood and Greep, R O *Proc Soc exp Biol N Y* 1938, 38 713

[10] Evans, Simpson M E and Lyons, W R *Ibid*, 1941, 46, 586 Evans Simpson, Lyons and Turpeinen K *Endocrinology*, 1941, 28, 933

[11] *Proc Soc exp Biol*, N Y 1937, 35, 645

[12] *Endocrinology*, 1941, 28, 309.

[13] Cutuly E *Proc Soc exp Biol*, *N Y* 1941, 48, 315

[14] Lessmann, P *Z Geburtsh Gynäk* 1939, 119, 271

Two of the three major points in the diagnosis of angina pectoris were brought out by Dr **Wilson Reid** in our issue of March 14 (p 313) The family history is undoubtedly of great importance, and adoption of the advice to suspect underlying coronary disease in every middle-aged patient complaining of "rheumatism" in the arms or shoulders pain in the chest, or "indigestion" would much reduce the number of cases that are overlooked The third essential for successful diagnosis is a full and detailed history of the pain its mode of onset and its distribution In every doubtful case electrocardiography is necessary Absence of changes here does not exclude the possibility of disease, but if all four leads are recorded sufficient extra information will be obtained to confirm the diagnosis in many cases which would otherwise remain doubtful In coronary thrombosis the main difficulty arises in the painless case, but here serial electrocardiograms usually clinch the diagnosis, if these are taken, including chest leads, it will be seldom that a definite diagnosis cannot be made

The treatment of coronary thrombosis is gradually becoming standardised, but two recent developments are worth noting Oxygen should now be administered as a routine during the first few days after the occlusion and while morphine is still required for the generalised sedation which it produces there is a growing body of evidence that the addition of atropine is beneficial in reducing the risk of reflex vagal activity initiating such fatal complications as ventricular fibrillation If atropine is to be of any value, however, it must be given in full dosage The therapeutic sheet anchor in the treatment of angina pectoris is undoubtedly the nitrites, preferably in the form of nitroglycerin but equally important is a complete overhaul of the patient s mode of living The rôle of gall-bladder disease in the ætiology remains unsettled, **Reid** attaches major importance to it, but most physicians will remain unconvinced that the benefit to be derived from surgical treatment of a diseased gall-bladder will compensate for the risk of a major surgical operation in a patient with diseased coronary arteries Of the advantages of conservative treatment of any focal sepsis there can be no doubt and this should form an integral part of the general supervision of the patient s mode of life

---

[1] Levy, R. L, Patterson J E Clark T W and Bruenn, H G *J Amer med Ass* 1941 117, 2113

Annotations

PRIORITY MILK AND EGGS

Tuberculosis officers but no-one else, may now issue a certificate for priority milk up to 2 pints daily to cases of pleurisy, with or without effusion, in which there are reasonable grounds for suspecting that the condition is tuberculous in origin This kind of illness should be entered on the certificate as Class 1g As regards milk for other cases of tuberculosis the Ministry of Food make it clear that the term "active tuberculosis" should be interpreted as meaning unhealed tuberculosis, the Advisory Committee holds that the possessors of calcified foci are not entitled to extra rations The position is, however, different for the possessors of healed peptic ulcers The committee takes the view that patients who have suffered from gastric or duodenal ulcer or dyspepsia or who have undergone operations on the stomach or duodenum or small intestine, may need extra milk and eggs even though they are now free of symptoms if they are to avoid becoming invalids and thus impairing the war effort, they may however, not require the maximum allowance Cases of typhoid or paratyphoid fever. or of amœbic or bacillary dysentery, may receive a priority claim for eggs under classes 3 and 4 of the schedule if they are being nursed at home All blank forms for medical certificates under the milk and egg priority schemes are in future to be held only by doctors, certified midwives or health visitors The issue of blank forms by food offices has been apt to convey the impression that the applicant is entitled to obtain the doctor's signature without question

IRRADIATION FOR MAMMARY CANCER

The latest report of the British Empire Cancer Campaign, reviewed last week (p 363) again illustrates how he results of treatment are prejudiced by the patient's failure to come early to the doctor, and demonstrates he need for methods of treatment which will not seem o the patient almost as dreadful as the disease For ancer of the breast there seems to be a possible solution Where facilities for effective radiotherapy are available no surgeon nowadays would advise the excision of a cutaneous cancer At gasworks and other places of employment which involve a risk of skin cancer the men themselves know that, in the early stages they can have these lesions cured painlessly by irradiation without going into hospital Consequently warts and other cutaneous lesions are reported at once and are cured without trouble and without leaving behind any fear of unfortunate sequels Admittedly one cannot argue from cutaneous cancer to internal cancer, but this experience makes one wonder whether irradiation might be the method of choice for treating tumours of the breast. These growths are not deeply seated and should be amenable to up to-date radiotherapy The prospect of this form of treatment should not deter the patient from seeking timely advice The alternative of radical excision involves a severe mutilation which distresses the surgeon every time he is compelled to perform it Naturally the patient dreads the ordeal. having discovered a small nodule in her breast or a retraction of the nipple she is apt to postpone a medical consultation through fear of what she will be told Last year's report of the British Empire Cancer Campaign (p 239) revealed that only 26% of patients with breast cancer had consulted a doctor within a month and 46 3% within three months of the first sign while 16% had allowed the disease to progress for eighteen months to four years before seeking advice Clearly radiotherapy cannot supplant surgery until it has been proved to be effective Keynes[1] has reported a five-year survival rate in 65 9% of 390 selected cases of mammary cancer treated by buried radium needles and he ended his Hunterian lecture of 1930 with these words[2]

> "I am persuaded that in the early cases, radium is the treatment of choice The tumour disappears within a few weeks, the tissues usually become normal, and, so far, in no early case has recurrence taken place The patient is unmutilated, and may even be able to use the breast for normal lactation. It is likely to be many years before the surgical world at large is ready to subscribe to this opinion."

In the twenty years which have passed since Keynes started this practice our knowledge of X and γ radiations and their therapeutic application has made immense strides. Lately Meland[3] has compared the outcome of treating 24 early cases of mammary cancer by X irradiation, followed by operation, with 28 cases in the same stage of the disease treated by X rays alone. The five-year cures amounted to two-thirds in the first series and just under half in the second. But the X-ray dosage seems to have been a good deal below the range that would be generally regarded as curative. It is noteworthy that among the patients of these two groups who died within the five-year limit the survival time was longest in those who had received X-ray treatment alone. The practice of combining radical mastectomy with preoperative and postoperative radiotherapy seems to meet with increasing favour, presumably because the combination leads to better results. The only way in which radiation can improve the prognosis must be by destroying cancer cells which the surgeon has been unable to remove, and if radiation can terminate the activity of these cells surely it might be made to deal effectively with those parts of the growth which the surgeon has taken away—though it has not yet done this with any certainty. The objection in the past has been that when a breast cancer is treated by irradiation alone the lump shrinks but does not entirely disappear—it cannot because it contains collagen, connective tissue and fat which are relatively insoluble. The residual lumps of this material remain to trouble both patient and surgeon, and there must still be a doubt whether it contains tumour cells, a doubt which even haphazard sections will not allay.

---

[1] Keynes G *Ann Surg* 1937, 106 619

[2] *Lancet* 1930, i, 442

ARTHRITIS AND OCCUPATIONAL THERAPY

REHABILITATION centres and mental hospitals make good use of occupational therapy but it has not until recently been much used in Great Britain for the treatment of crippling rheumatic diseases. A few years ago Dr W. S. C. Copeman[4] discussed the principles which should underlie such treatment; now Dr Hugh Burt[5] reports his experience of this method among a group of women with rheumatoid arthritis at the Hospital of St John and St Elizabeth. The arthritic, he says, is particularly suitable for this treatment because both psychological and orthopædic factors play a part in the disease. Arthritis often appears after a long period of worry—for example it may attack a woman who has been nursing a dying relative or looking after a psychotic husband until he has to be certified—and it is usually associated with a feeling of helplessness and uselessness. Treatment aims at stopping the disease process (gold, he considers, is the most successful remedy at present), at preventing deformity by means of light plaster splints, and at getting rid of stiffness by physiotherapy and such forms of occupation as will not throw much weight on the affected joints. In the early stages the game of solitaire, played with a board and marbles, hand rolling with a soft pad, and wool-winding are effective. Later, when the active phase of the disease has passed, or when the hands have become deformed, an occupation is needed which keeps the joints supple, stretches contracted muscles, and contracts those which are wasted and stretched. Crafts which require the worker to hold the tool in a fixed position are harmful; thus hooked-rug making and knitting should be avoided. Heavy crafts such as wood-carving, bookbinding and heavy carpentry are also open to objection because they put too much strain on the weakened muscles. Basketwork, on the other hand, is satisfactory because the fingers, in plaiting the cane weavers in and out, become loose and are kept so; and after each stroke the weavers have to be pressed firm, which can only be done with the fingers extended and abducted. If the shoulders are arthritic the patient can use longer pieces of cane, requiring considerable abduction of the arm to manipulate. Other crafts exercising the arms are cord-knotting, plaiting, weaving and block printing. Weaving is especially useful because looms can be of varying size and weight, and so can the woven material. Silk stocking cut into strips makes very light material and can be managed by the bedridden; knitting-wool, rug wool, hemp, rope and towelling are heavier materials. It is not so easy to exercise the legs. A football can be suspended over the bed, and the patient, with his thighs hanging from bars, can push it away with the feet; but few patients like doing it—possibly they think the attitude undignified. The knees can be exercised on a bicycle attached to a sewing machine or a fretsaw; a foot power loom exercises hip, knee and ankle, while the arms are used to throw the shuttle and swing the beater.

Occupational therapy for the arthritic differs from that for the psychotic, for the aim is not to keep the patient tranquil and occupied but to keep special groups of muscles exercised—an orthopædic problem. The time spent at work must be carefully graded. Mental patients can work for an hour or two at a stretch, but an arthritic may complain of pain and fatigue in a few minutes. Burt advises that no arthritic patient in the early stages of treatment should be allowed to work for more than 10 minutes without a rest; in many cases 5 minutes is long enough. The therapist must have the eye of an eagle for those tricks by which a patient—consciously or unconsciously—avoids using a given muscle or group of muscles. Thus a patient set on a bicycle to exercise his quadriceps may soon find a way to do most of the work with the glutei. The occupational therapist, then, must be someone who knows anatomy. On the psychological side, the work must be interesting, and a high standard should be expected. He points out that if someone in the ward is producing good work in spite of her deformity the standard of work improves all round and there are fewer complaints of pain. The occupational therapist, the masseuse and the physiotherapist should work together. Occupation becomes much easier if it is preceded by some form of physical treatment, such as a wax bath for arthritic hands and wrists, heat and massage to the muscles of the shoulder or infrared or short-wave diathermy for the knee. Light plaster hand splints correct flexion and ulnar deviation, and can be put on immediately after occupation. Burt does not give the number of patients treated, or analyse his results, but he gives the scheme of treatment followed in two of his cases, both of which improved within a few weeks of beginning treatment.

THE SOCIABLE INFANT

THE fashion in child management which required a mother to let the baby scream indefinitely rather than pick him up is fortunately dying out—fortunately because, though it can never have been good for the mother, it is now becoming clear that it is even worse for the child. The aim was to prevent the baby from becoming a tyrant in the home; the result was conceivably to turn him into a dolt or a difficult person. Bowlby[1] found some evidence that behaviour difficulties in children were often associated with a history of separation from the mother in the early years, and that an outstanding characteristic of such children was their lack of affection in their relations with others. It is likely that the growth of normal affection depends on teamwork between the mother and the young child; from the Bellevue Hospital, New York, comes the suggestion that ordinary physical growth and resistance to infection may depend on it as well. Bakwin[2] points out that the failure of infants to thrive in hospitals was attributed, up to twenty years ago, to our lack of knowledge of nutrition; nowadays infection gets credit for being the active factor. An outcome of this change of view has been to increase the isolation of the infant in hospital to the point of solitary confinement. To prevent cross-infection infants are walled off in cubicles, packed away in glass cases and attended (with the minimum of handling) by robed, masked, hooded, scrubbed nurses and doctors who move cautiously and speak low so as to keep down the bacteria in the air. Such protected nursing is ideal for the acutely ill patient (the infant having a Rammstedt's operation, for example) who is likely to stay only a week or two in hospital, but it is sometimes mistakenly continued long after the child should have joined the others in the main ward: an acute illness may become chronic and so may life in a cubicle. The young child's mind is feeding on experience, at no period of its life will it again have such blotting-paper facility for picking up impressions. It is only necessary to think successively of the newborn fœtus encountering its first breath, and the competent, lively, curiosity-ridden yearling, already striving after speech and an upright gait, to see how much solid learning is packed into the first twelve months. Life in a cubicle is experience of a kind, no doubt, but experience so boring that the grossly understimulated occupant may go back instead of forward, he even ceases to respond to the things which normally please him. Bakwin finds that some infants go further—they lose weight and become prey to chronic infections. Respiratory catarrhs which last a day or two at home may, he says, persist for months in hospital; with mistaken kindness the house-physician judges that the child is not fit enough to go out, whereas he is really not fit enough to stay in. A return to the care of the mother and the normal experiences of home life may have a startling effect, Bakwin publishes photographs of children for whom discharge from hospital has certainly been a godsend. As a result of this belief medical officers at the Bellevue Hospital have been encouraged of late years to play with and lift the children, and parents of sick infants are invited into the wards and told to pick the baby up. No doubt more handling increases the risk of cross-infection, a reflected rise in infant mortality might be expected, but in actual fact the case fatality rate at Bellevue, after being steady at 30–35% up to 1929, has fallen since and is now below 10%. Bakwin does not suggest that the freer handling of children has made this difference, of course, many factors have been at work. But it is clear that more mothering has not meant a corresponding increase in deaths.

---

[3] Meland, O. N. *J. Amer. med. Ass.* 1942, 118, 274.

[4] *Brit. J. phys. Med.* 1938, 1, 350.

[5] *J. R. Inst. publ. Hlth*, 1942, 5, 33.

[1] Bowlby, J. *Int. J. Psycho-Anal.* 1940, 21, 154; and see *Lancet*, 1940, ii, 170.

[2] Bakwin, H. *Amer. J. Dis. Child.* 1942, 63, 30.

A GREAT SPANISH SURGEON

MANUEL CORACHAN who has died in Barcelona at the age of sixty-two, was one of the most distinguished Spanish surgeons of our time and the outstanding personality of the Catalan school of surgery. He was a victim of the epidemic of typhus which it seems is still spreading to new parts of the Peninsula. Corachan had been a pupil of Ribas-Ribas and if in activity and enterprise he was the equal of his teacher, he was his superior in skill and manual dexterity. Besides being an honorary member of many continental surgical societies, the founder of the Spanish Association of Surgeons, founder and one of the presidents of the Catalan Surgical Society, he found time to write an impressive number of papers and several books. Among the latter are two volumes on gastric surgery—probably the most complete work on that subject in Spanish—his work on arthroplasty, and his remarkable contribution to the technique of and indications for arteriography, an important complement to the pioneer work of the Portuguese school of Moniz and Dos Santos. The sufferings of the Spanish War fell upon Corachan in full measure. His eldest son, a very promising brain surgeon, was killed at the front, and Corachan himself was obliged to live in exile until recently when he was allowed to return to Spain. During his years of exile he received an invitation from the university of Caracas, Venezuela, where he was appointed professor and director of the Institute of Experimental Surgery, a number of works, some of them of interest, were published there under his guidance. He was loved by his students and by all who came in contact with him for his modesty and sincerity. With his passing has gone one of the most brilliant surgeons that the Peninsula has ever produced and his death will be deeply mourned, particularly in his own country and in Latin America.

MEASLES AND ULTRA-VIOLET LIGHT

THE annual report of the Commonwealth Fund differs from many of its compeers in being easy to read, and some of the best stories in it are to be found in the "sketches from the field." The 1941 report tells of an experiment carried out by W. F. and M. W. Wells, of the laboratories for the study of air-borne infection at the University of Pennsylvania. These workers—who with T. S. Wilder, have reported their findings fully elsewhere[1] —have evidence that ultraviolet lamps kept constantly burning in school classrooms (not directly exposing the children but producing an irradiated ceiling) check the spread of measles and possibly also of chickenpox and mumps. The 1940 measles epidemic in Philadelphia was the largest on record but it seems to have been checked by this method in 22 classrooms in Germantown in the city and Swarthmore just outside it. The lamps were first installed in 1937, to decide whether epidemic infection could be controlled by radiant disinfection of the air. In the Germantown Friends School records of illness showed which children could be presumed to be immune from measles, thanks to a previous attack, and which were probably susceptible. Histories of previous attacks are not usually very reliable, but they would probably be accurate enough to give the figure a bias in the right direction. Records of illness were kept throughout the investigation. In the first three years of the experiment there were no striking episodes except an encouraging result in a small outbreak of chickenpox. In October 1940, however, measles became widespread in Philadelphia and the school records showed that the Germantown children were ripe for an outbreak—during the three years of observation susceptibles had risen from 12% to 23% among the senior children, from 26% to 49% in the intermediate grades, and among the junior children, who had the lamps in their classrooms, from 62% to 75%. By the end of the epidemic 88 of the 141 susceptible senior and intermediate pupils (taught in non-irradiated classrooms) had taken the infection, while only 24 of the 110 susceptible children in the junior grades had gone down with it. It turned out that 10 of the older children and 8 of the junior children had caught their measles at home, so that 55% of the 141 children in older groups and 14.5% of the junior children had been infected in school. The same pattern was found in the Swarthmore schools. Among 191 susceptible children in the younger grades, using irradiated classrooms, there were 47 cases, the attack-rate being 13% when cases of measles caught at home were excluded, among 137 susceptible children in the senior grades, not protected by lamps, the attack-rate was 52%. The unusual distribution between seniors and juniors might, of course have been due to some peculiarity of the virus or to greater susceptibility among the seniors, and not to the lamps at all, but there was no such reversal of age-incidence in Philadelphia as a whole. Moreover though no control experiments were made, a neighbouring school in Germantown offered some figures for comparison—among 95 boys in the junior grades (susceptibility unknown) the attack-rate was 50% and among 391 in the senior classes the rate was 10%. In the experimental schools comparable figures are obtained by working out the attack-rates for the classes as a whole susceptible and non-susceptible together. Thus at the

---

[1] *Amer. J. Hyg.* 1942, 35, 97.

Germantown Friends School the rate among the total group (145) of irradiated juniors was 17% and among the 379 non-irradiated seniors 23%; at the Swarthmore school the attack-rate was 14% among 339 juniors and the same among 535 seniors. These figures are certainly suggestive. It is not quite clear, however, why the attack-rates among the unirradiated seniors at the experimental schools were appreciably higher than that in the neighbouring school used as a control. Perhaps the proportion of susceptible children was widely different in the compared schools. This is the kind of field experiment that was needed, and it fits in with theory. Measles is largely spread from schools and if the younger school-children could be protected there would be a good chance of reducing the fatality and morbidity due to complications.

FOOD POLICY

SIR JOHN RUSSELL presided at last week's conference, arranged by the British Association, on agricultural reconstruction after the war. Foremost of relief measures, he said, would stand the production of food on the spot, especially the milk and protective foodstuffs required by the growing child. Peasants must be free to produce food without worrying about marketing it, for which cooperative societies were well fitted. Dr. N. Barou remarked that in the U.S.S.R. the problem of marketing had been solved by collective farming. This conference was facing some of the larger issues raised at the second scientific meeting (reported on another page) of the Nutrition Society. Here farmers, physiologists and doctors got to grips with the production and distribution of essential foods in this country. Behind the apparently competing interests of man and beast is emerging a policy soundly based on exact knowledge and experience which should help to steady perplexed ministers of state.

STUDENTS' CALL-UP

A STUDENT at a London hospital estimates the average hours of work done by his fellow students at not more than 30 a week, and maintains that, excluding the one who would always fail in any subject involving prolonged academic study, there is no medical student who, working a 40-hour week, is not capable of passing his examinations at the first sitting. Yet, he says, students have failed their examinations two or three times and still been allowed to continue their studies, thus postponing their qualification and call up for as much as a year. To remedy this situation, which he condemns as a disgrace, he suggests a Ministry of Labour order that failure in any examination would mean immediate call-up to the Services, illness or other valid excuse excepted. In a modified form this procedure has already been adopted in at least one provincial university, the modification being that two failures instead of one means dereservation. A fifth-year student at this school sends us a copy of the following circular letter which is sent by the dean to any student who fails a professional examination, whether inside or outside the university:

> DEAR SIR,—The Faculty of Medicine, having considered the progress of students in relation to their reservation under the Military Service Acts now in operation, wishes to draw your attention to the fact that your progress during the period ending in December, 1941, has not been satisfactory. It therefore desires to warn you in good time that unless the results of your examinations in March, 1942, are favourable, it will not be able to recommend to Senate that a certificate of satisfactory progress should be supplied in your case to the Ministry of Labour. You will appreciate that without this certification of satisfactory progress your registration as a student of this university and your reservation as a medical student will both cease.

It is easy to imagine, says our correspondent, the nervous state in which the candidate who has received one of these faces the examiners next time. He can understand the attitude as applied to first and second year students who entered the university after the outbreak of war, but "fourth, fifth and sixth year students regard the threat to their studies as a complete waste of their past years' work, and a great discouragement in their last months of medical study in order to qualify." He urges that if it must be applied at all such a principle should be applied by the Government or General Medical Council to all medical schools. At present the reservation of a medical student is conditional on the receipt by the Ministry of Labour of satisfactory progress reports from the dean of his school, and with the present shortage of young doctors it does seem undesirable that these progress reports should be too rigidly tied to examination results. There are many worthy doctors on the Medical Register who, though working many more than 40 hours a week, failed to pass their examinations at the first, or indeed the second or third, sitting. In war-time there can be no place in a medical school for the chronic examinee of peace-time, but deans must surely be left free to distinguish merit from gaud.

CLOSURE OF THE DUCTUS VENOSUS

IT was Samuel Butler who, in support of his thesis of unconscious memory, drew attention to the fact that though the young mother knew very little about her baby the baby knew a great deal about its mother. But this maternal ignorance, like so much ignorance in general, is not shared by animals that we are pleased to regard as being lower than ourselves in the scale of life. In mammalian embryonic development there comes about a curious change in the functional disposition of the veins passing to the sinus venosus by way of the inferior vena cava. The original vitelline venous blood has need to run the gauntlet of the liver cells before it is received into the general circulation—it passes through the so-called sinusoidal circulation of the liver. But when the placenta is established, the placental blood has no such need. It was not by chance that the masters of anatomy regarded the placenta as the "womb liver." The placental blood cuts out a new channel through the liver and this is known as the ductus venosus. At birth the placental circulation ceases; the old vitelline (portal) circulation opens up anew through the sinusoidal channels of the liver. The "lower" mammalian mother respects this profound change in functional adjustment and permits it to take place in a proper and leisurely manner. She stimulates the young thing to readjust that part of its circulation determined to its newly awakened lungs. No busy obstetrician ligatures the cord. The umbilical circulation slowly comes to a standstill and the mother animal deals with the business in a leisurely and methodical fashion. But since all mothers—even lower mammalian mothers—may not be wise in these things, Nature has placed a safeguard against the results of her possible ignorance. The ductus venosus has in itself a mechanism of adjustment that is prepared to act in advance of that profound disturbance of circulatory function caused by severance of the umbilical cord. This mechanism, thanks to the work of Barclay, Franklin, Prichard[1] and their associates, we are now able to understand. The beautiful X-ray cinematographic pictures of the circulation in living mature lambs delivered by cæsarean section produced by these workers have revealed the rhythmic activity of a sphincter at the beginning of the ductus venosus. It is this sphincter that regulates the flow of umbilical blood and brings about its gradual cessation in preparation for the severance of the cord. Here is a study of structure and function that would have delighted the heart of John Hunter.

---

[1] Barclay, A. E., Franklin, K. J., Prichard, M. M. L. *Brit. J. Radiol.* 1942, 15, 66.

Special Articles

SYSTEMIC MYCOSES

J. T. DUNCAN, F.R.C.S.I., D.T.M. & H.
EMERGENCY PUBLIC HEALTH LABORATORY SERVICE; LECTURER IN THE LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE

MOST fungal infections in man are epiphytic, and even those involving deeper tissues and organs may develop by extension from skin or subcutaneous lesions or may have associated secondary skin lesions; for this reason medical mycology is often treated as a province of dermatology, and some of its graver implications may thus be overlooked.

Except for such diseases as ringworm and thrush, which are caused by parasitic epiphytes transmitted from animal to animal, mycoses are commonly caused by fungi known to live saprophytically in nature, and infection is believed to occur directly from this source. The pathology of these mycoses differs from that of most bacterial infections in that the fungus seems to possess little if any invading power and is usually introduced passively into the skin or subcutaneous tissues through penetrating wounds or other traumata; but it may also gain entry from the mouth or by ingestion or inhalation. Infection is probably determined by the intrinsic power of adaptation of the fungus from saprophytism to parasitic life in animal tissues, and by the absence of any specific resistance on the part of the host's tissues, which at first react merely as against a foreign body. The fungus elements, probably engulfed by phagocytic cells which are not capable of destroying them, become adapted to parasitic life, usually with striking morphological as well as physiological modification. Thus the parasitic form may not resemble the saprophytic form of the fungus—a thing to be remembered when making diagnostic examinations. At the same time the tissue reaction takes the form of an infective granuloma, usually without an accompanying inflammatory reaction. Thereafter the fungus vegetates locally; or it may spread to adjacent or remote parts, directly or by the agency of wandering phagocytes or by the lymph- or blood-streams. The ultimate localisation in particular organs or tissues, such as the lungs, meninges or reticuloendothelial system, may be determined by tissue tropism.

Early constitutional symptoms, local inflammation and pain are usually absent; thus the progress of the disease is insidious until it has become extensive or until a vital organ is affected; suspicion then often points to tuberculosis, syphilis or some other infective granuloma. The diagnosis depends on mycological examination, which may require the cultivation of the causal fungus. Diagnosis is often made late in the disease and this, in some measure, may affect the prognosis, which is usually unfavourable. Chemotherapy, including the newer methods, offers little hope of cure in the grave systemic mycoses.

COCCIDIOIDAL GRANULOMA

A grave systemic mycosis is caused by *Coccidioides immitis*; it gives rise to skin lesions—sometimes massive and usually painless—of a papillomatous or gummatous character with ulceration, often simulating tuberculosis; or it may produce extensive subcutaneous gummatous lesions tending to suppurate. Sooner or later extension occurs to the deeper organs, especially the lungs, and the generalised infection may involve any tissue. Constitutional symptoms are ill-defined or absent in the early stages of the disease, but visceral involvement or generalisation may be followed by severe cachexia with remittent fever, night sweats, wasting and other evidences suggesting tuberculosis.

The causative fungus, *Coccidioides immitis*, is found in the lesions, often within giant cells, and appears as thick-walled, spherical cysts 3–80 μ in diameter, sometimes filled with smaller bodies 3–6 μ in diameter. The histopathology of the granuloma resembles that of tuberculosis with the cyst of coccidioides replacing the tubercle bacillus. The diagnosis, usually made relatively late in the disease even in endemic areas, depends on the identification of the parasitic cysts in stained sections or smears, or wet preparations mounted in 10% caustic potash, of material from the lesions or sputum. Cultivation of the fungus which may be necessary and is not difficult, yields a sterile mycelial growth pathogenic for mice in which animals the parasitic cysts are reproduced.

The disease has been known for nearly half a century in North and South America and is endemic in parts of California, but is nowhere common. It affects chiefly agricultural workers, especially those engaged in grape culture, and it has also been found in cattle, sheep and swine. The causative fungus has been cultivated from the soil in California. The infection may be contracted through lesions of the skin, but also by inhalation and primary disease of the lung is not rare. The prognosis is extremely grave in the generalised disease, but cure has been reported after extirpation of a localised skin infection. Chemotherapy has not yet proved successful.

CHICAGO DISEASE

Another disease characterised by polymorphic ulcero-papillomatous skin lesions, but rarely followed by generalisation, is Gilchrist's or Chicago disease. The causative fungus *Mycoderma dermatitidis*, is smaller than *C. immitis* and reproduces by budding. In culture it is dimorphic, vegetating as a yeast or as a sterile mycelial growth resembling that of *C. immitis*. The disease is more widely distributed than coccidioidal granuloma in America, and it has been suspected in England. The dermal stage is curable by chemotherapy but the prognosis is grave if the viscera become involved.

SPOROTRICHOSIS

In sporotrichosis, first described by Schenck in the United States in 1896, mycotic gummata develop in the skin and superficial lymphatic vessels, usually without associated adenopathy. Essentially it is a disease of the skin and subcutaneous tissues with occasional involvement of the mucosæ, especially of the nose and mouth, and rarely the viscera or even the osseous system. It is caused by species of *Sporotrichum* or *Rhinocladium*, of which the more important are *S. schenckii* in America and *S. beurmanni* in Europe. Sporotrichosis has also been found in the horse and mule (caused by *S. equinum*) and in the rat and dog. The causative fungi are known to vegetate as saprophytes in nature, living on dead and decaying vegetable matter and the infection in most cases is believed to be from this source. Trauma plays an important rôle, and the initial gumma or chancre has been known to develop in the site of a wound or other injury after an apparent incubation period of a few weeks. Infection through the alimentary tract or by inhalation also seems possible, and in such cases the skin may be secondarily involved.

The initial lesion usually appears on some exposed part of the body, often the wrist or hand, and may remain single or be followed by a neighbouring group of secondary skin gummata or a chain in the course of a superficial lymphatic vessel, without associated lymphadenitis. The gumma, which is elastic and painless, adherent to the skin but mobile on the deeper tissues undergoes central necrosis and breaks down and discharges, leaving a punched-out ulcer from which a thin muco-sanguinolent fluid exudes. The central part of the gumma is occupied by histiocytes, giant cells and polymorphonuclear leucocytes filled with the parasitic form of the fungus—oval, round or oat-shaped, yeast-like bodies 2–5 μ in diameter. Dissemination by the blood-stream may cause a generalised skin eruption of gummata which are smaller than those of the localised groups and show less tendency to break down. When the skin lesions are multiple, the clinical diagnosis is not difficult and the absence of adenopathy and any disturbance of the general health helps to differentiate the disease from syphilis and tuberculosis.

The mycological diagnosis is best made by culture using heavy sowings of gumma material on glucose-agar slopes, the characteristic glistening white starfish-shaped colonies beginning to appear after 5–7 days at room temperature. The microscopic morphology of the culture (different from the parasitic form) is characteristic, and the fungus is easily identified. Diagnosis by microscopical examination of direct smears of gumma material is less easy, although the parasitic form can be beautifully demonstrated by the Gram-Claudius staining method.

Sporotrichosis has been found chiefly in North and South America, South Africa and Europe, including England, but it is nowhere common. The dermal stage yields readily and completely to intensive potassium-iodide administration, being cured in 2–3 months; but in generalised forms the response may be slower and when the mucous membranes are affected the prognosis becomes less favourable, and is grave with extensive involvement of the viscera.

Skin gummata and ulcers may also be caused by *Hemispora stellata*, *Hormodendron langeroni*, *Acladium castellanii* and other fungi, and diagnosis must depend on culture.

TORULA INFECTIONS

Torulosis affects chiefly the central nervous system and the lungs, but may also attack the pleura and peritoneum, lymphatic glands, joints and articular ends of bones, and may cause subcutaneous and deep abscesses. The causative fungi belong to a group of asporogenic yeasts, most of which form honey-coloured, slimy, semi-fluid growths on sugar-agars and conform to the characters of torula as understood by Will and others.[1] The species most often named is *Torula histolytica*,[2] but this identification is sometimes based on pathological rather than on mycological considerations. The pathogenic species are many and some approximate more to the characters of saccharomyces and related genera, of which they may be imperfect forms, than to those of torula. Possibly minor differences in the character of the disease may be related to the type of infecting yeast. The sources of infection are not known, but similar kinds of torula, pathogenic for animals, have been found as saprophytes in foodstuffs, especially cheese and other milk products and dried fruits. The portal of entry is conjectural, but a history of severe tonsillar thrush followed by torula infection of the cervical lymphatic glands, pleura, lung and meninges of the brain has been recorded. The superior or posterior nares may be a route to localised intracranial infections, and the possibility of infection by inhalation, by ingestion or through lesions of the skin must be accepted. The disease has been found in the horse as well as in man.

In the lesion the torula appears as a round yeast, varying in diameter between 3μ and 12μ, surrounded by a thick gelatinous capsular substance which, when the torulæ are numerous, gives the invaded tissue a myxomatous character. The action of the torula is histolytic, and the tissue response is chiefly a reparative fibrosis without active inflammation. When the torulæ are few and not multiplying rapidly the cellular reaction is of the infective granuloma type with histiocytes and giant cells often containing the torulæ.

In the lung, extensive destruction of tissue may be caused, with gelatinous consolidation, excavation or fibrosis. In the peritoneum or pleura a massive gelatinous exudate may develop containing masses of the capsulated torulæ which have been mistaken, in stained preparations, for mononuclear leucocytes. In the cold abscesses of muscles and subcutaneous tissues the capsulated torulæ are found free or within phagocytes in a pus composed mainly of polymorphonuclear cells. In infections of the meninges the gelatinous matter may occupy the subarachnoid space and distend the basal cisterns; often, however, the reaction is a granulomatous thickening of the pia-arachnoid in which many torulæ are found within giant cells and histiocytes, and this process may follow the distribution of the pia into the ventricles. Miliary cysts or abscesses may occur in the subcortical white matter in the distribution of the superficial blood-vessels, and deeper abscesses of embolic origin may develop in generalised infections.

The symptomatology of torulosis is not characteristic and tuberculosis is often suspected. In the early stages of localised infections there may be little constitutional disturbance, but in advanced disease, especially of the lung, fever, sweating and wasting may be well marked. In meningeal infections the early symptoms are those of cerebral irritation with signs of increased intracranial pressure, general or local, suggesting tuberculous meningitis or brain tumour with relatively slight constitutional disturbance.

The diagnosis depends on finding the causative torula, microscopically or by culture, in material from the lesion, the sputum or lung juice in pulmonary cases, and sometimes by blood-culture in generalised infections. Localised disease of the central nervous system presents the greatest difficulty in diagnosis, and repeated lumbar puncture and even occipital puncture may be necessary before it is possible to detect or cultivate the torula. The prognosis is always serious, and in meningeal, lung and generalised infections very grave. Chemotherapy offers little hope of cure.

Torulosis has been recorded in many parts of the world, including England. The disease is not common but the small total of cases published gives a false impression of rarity. In England only a fraction of the cases identified have been published and no doubt most of the cases remain undiagnosed.

PULMONARY MONILIASIS

Species of "thrush" fungi commonly called monilia are believed to invade the lung. The pathology and clinical features are not well defined and the diagnosis depends on the presumed exclusion of other microbic causes of lung diseases, and on the finding of monilia in the sputum or monilia antibodies (not specific) in the blood. The value of this positive evidence is largely vitiated by the fact that monilia may be found in the sputum and its antibodies in the blood from other causes than pulmonary moniliasis. Species of monilia, in addition to causing thrush and a form of dermatitis, are common saprophytes or harmless parasites in the mouths and intestines of many healthy people, and they may be especially numerous in the unclean mouths of people suffering from various lung diseases. The practice of rinsing the mouth before expectorating is not sufficient to prevent monilia from the pharynx and fauces getting into the sputum; and tests of virulence and apparent pneumotropism do not conclusively determine the pulmonary origin of monilia found in the sputum. Fungi of this group may also occur as saprophytes in old bronchiectatic or tuberculous lung cavities and they have been known to invade neoplasms. Moreover, the serum of persons who harbour monilia in the intestine and also suffer from some intestinal derangement, due to malaria, dysentery, sprue or other diseases, may agglutinate monilia in serum titres of 1 : 100, 1 : 300 or even 1 : 1000, and give good precipitation and complement-fixation reactions with monilia extracts, so that the value of a positive serum agglutination reaction is not great, though a negative result is more conclusive.

Pulmonary moniliasis is the systemic-mycosis most frequently recorded in English medical literature, but most of the reports fail to offer proof of the infection. Admittedly, monilia is capable of rapid exaltation of virulence and possesses latent invasive properties which would make infection of the lung possible, but it is significant that cases diagnosed with the greatest confidence have been found at autopsy not to be pulmonary moniliasis but some other disease, and careful examination of the lungs has failed to reveal monilia although the yeasts had been abundant in the sputum. The diagnosis of this disease should be made only after exhaustive examination and on unequivocal evidence.

Pulmonary aspergillosis, caused chiefly by aspergilli of the *Aspergillus fumigatus* and *A. flavus-oryzæ* groups, is rare, but the possibility of its occurrence among fodder-handlers in Britain might repay investigation.

HISTOPLASMOSIS

A mycosis of the reticuloendothelial system is caused by the yeast-like parasitic form of *Histoplasma capsulatum* which fills the endothelial cells, stimulating them to hyperplasia and the formation of local granulomata with associated focal necroses in various organs and tissues; the lung, liver and spleen are probably the most commonly affected. Symptoms are protean, and may closely simulate kala-azar or pulmonary tuberculosis.

The diagnosis is made by identifying the causal fungus in smears or sections from the affected tissues, pus, blood or sputum. It appears as a round or oval yeast, 3–4μ in diameter, having a thick highly refractile capsular structure, and occurring in large numbers in the cytoplasm of endothelial and other phagocytic

---

[1] See Harrison, F. C. *Trans. roy. Soc. Can.* 1928, 22, 187.
[2] Weidman, F. D., Freeman, W. *Arch. Neurol. Psychiat.* 1923, 9, 569.

Sporotrichosis has been found chiefly in North and South America, South Africa and Europe, including England, but it is nowhere common The dermal stage yields readily and completely to intensive potassium-iodide administration, being cured in 2–3 months, but in generalised forms the response may be slower and when the mucous membranes are affected the prognosis becomes less favourable, and is grave with extensive involvement of the viscera

Skin gummata and ulcers may also be caused by *Hemispora stellata*, *Hormodendron langeroni*, *Acladium castellanii* and other fungi, and diagnosis must depend on culture

TORULA INFECTIONS

Torulosis affects chiefly the central nervous system and the lungs, but may also attack the pleura and peritoneum, lymphatic glands, joints and articular ends of bones, and may cause subcutaneous and deep abscesses The causative fungi belong to a group of asporogenic yeasts, most of which form honey-coloured, slimy, semi-fluid growths on sugar-agars and conform to the characters of torula as understood by Will and others[1] The species most often named is *Torula histolytica*,[2] but this identification is sometimes based on pathological rather than on mycological considerations The pathogenic species are many and some approximate more to the characters of saccharomyces and related genera, of which they may be imperfect forms, than to those of torula Possibly minor differences in the character of the disease may be related to the type of infecting yeast The sources of infection are not known, but similar kinds of torula, pathogenic for animals, have been found as saprophytes in foodstuffs, especially cheese and other milk products and dried fruits The portal of entry is conjectural, but a history of severe tonsillar thrush followed by torula infection of the cervical lymphatic glands, pleura, lung and meninges of the brain has been recorded The superior or posterior nares may be a route to localised intracranial infections, and the possibility of infection by inhalation, by ingestion or through lesions of the skin must be accepted The disease has been found in the horse as well as in man

In the lesion the torula appears as a round yeast, varying in diameter between 3μ and 12μ, surrounded by a thick gelatinous capsular substance which, when the torulæ are numerous, gives the invaded tissue a myxomatous character The action of the torula is histolytic, and the tissue response is chiefly a reparative fibrosis without active inflammation When the torulæ are few and not multiplying rapidly the cellular reaction is of the infective granuloma type with histiocytes and giant cells often containing the torulæ

In the lung, extensive destruction of tissue may be caused, with gelatinous consolidation, excavation or fibrosis In the peritoneum or pleura a massive gelatinous exudate may develop containing masses of the capsulated torulæ which have been mistaken, in stained preparations, for mononuclear leucocytes In the cold abscesses of muscles and subcutaneous tissues the capsulated torulæ are found free or within phagocytes in a pus composed mainly of polymorphonuclear cells In infections of the meninges the gelatinous matter may occupy the subarachnoid space and distend the basal cisterns, often, however, the reaction is a granulomatous thickening of the pia-arachnoid in which many *torulæ* are found within giant cells and histiocytes, and this process may follow the distribution of the pia into the ventricles Miliary cysts or abscesses may occur in the subcortical white matter in the distribution of the superficial blood-vessels, and deeper abscesses of embolic origin may develop in generalised infections

The symptomatology of torulosis is not characteristic and tuberculosis is often suspected In the early stages of localised infections there may be little constitutional disturbance, but in advanced disease, especially of the lung, fever, sweating and wasting may be well marked In meningeal infections the early symptoms are those of cerebral irritation with signs of increased intracranial pressure, general or local, suggesting tuberculous meningitis or brain tumour with relatively slight constitutional disturbance

The diagnosis depends on finding the causative torula, microscopically or by culture, in material from the lesion, the sputum or lung juice in pulmonary cases, and sometimes by blood-culture in generalised infections Localised disease of the central nervous system presents the greatest difficulty in diagnosis, and repeated lumbar puncture and even occipital puncture may be necessary before it is possible to detect or cultivate the torula The prognosis is always serious, and in meningeal, lung and generalised infections very grave Chemotherapy offers little hope of cure

Torulosis has been recorded in many parts of the world, including England The disease is not common but the small total of cases published gives a false impression of rarity In England only a fraction of the cases identified have been published and no doubt most of the cases remain undiagnosed

PULMONARY MONILIASIS

Species of "thrush" fungi commonly called monilia are believed to invade the lung The pathology and clinical features are not well defined and the diagnosis depends on the presumed exclusion of other microbic causes of lung diseases, and on the finding of monilia in the sputum or monilia antibodies (not specific) in the blood The value of this positive evidence is largely vitiated by the fact that monilia may be found in the sputum and its antibodies in the blood from other causes than pulmonary moniliasis Species of monilia, in addition to causing thrush and a form of dermatitis, are common saprophytes or harmless parasites in the mouths and intestines of many healthy people, and they may be especially numerous in the unclean mouths of people suffering from various lung diseases The practice of rinsing the mouth before expectorating is not sufficient to prevent monilia from the pharynx and fauces getting into the sputum, and tests of virulence and apparent pneumotropism do not conclusively determine the pulmonary origin of monilia found in the sputum Fungi of this group may also occur as saprophytes *in old bronchiectatic or tuberculous* lung cavities and they have been known to invade neoplasms Moreover, the serum of persons who harbour monilia in the intestine and also suffer from some intestinal derangement, due to malaria, dysentery, sprue or other diseases, may agglutinate monilia in serum titres of 1 100, 1 300 or even 1 1000, and give good precipitation and complement-fixation reactions with monilia extracts, so that the value of a positive serum agglutination reaction is not great, though a negative result is more conclusive

Pulmonary moniliasis is the systemic mycosis most frequently recorded in English medical literature, but most of the reports fail to offer proof of the infection Admittedly, monilia is capable of rapid exaltation of virulence and possesses latent invasive properties which would make infection of the lung possible, but it is significant that cases diagnosed with the greatest confidence have been found at autopsy not to be pulmonary moniliasis but some other disease, and careful examination of the lungs has failed to reveal monilia although the yeasts had been abundant in the sputum The diagnosis of this disease should be made only after exhaustive examination and on unequivocal evidence

Pulmonary aspergillosis, caused chiefly by aspergilli of the *Aspergillus fumigatus* and *A flavus-oryzæ* groups, is rare, but the possibility of its occurrence among fodder-handlers in Britain might repay investigation

HISTOPLASMOSIS

A mycosis of the reticuloendothelial system is caused by the yeast-like parasitic form of *Histoplasma capsulatum* which fills the endothelial cells, stimulating them to hyperplasia and the formation of local granulomata with associated focal necroses in various organs and tissues, the lung, liver and spleen are probably the most commonly affected Symptoms are protean, and may closely simulate kala-azar or pulmonary tuberculosis

The diagnosis is made by identifying the causal fungus in smears or sections from the affected tissues, pus, blood or sputum It appears as a round or oval yeast, 3–4μ in diameter, having a thick highly refractile capsular structure, and occurring in large numbers in the cytoplasm of endothelial and other phagocytic cells. It is easily demonstrated by Gram's or Giemsa's stains. Culture of the fungus from morbid material is not difficult but may be slow: it takes from a few days to about three weeks, and the fungus grows rather better at 24° C than at 37° C. In saprophytic life the fungus is dimorphic: a mycelial form, bearing characteristic reproductive bodies, grows on nearly all common media at body heat or room temperature, and another form resembling the parasitic yeast stage develops only on particular media at temperatures near 37° C.

---

[1] See Harrison, F C *Trans roy Soc Can* 1928, 22, 187

[2] Weidman, F D, Freeman, W *Arch Neurol Psychiat* 1923, 9, 569

The disease was first described by Darling in 1905; he found it at autopsy on 3 cases in Panama. Less than half a dozen additional cases were recorded during the next 27 years. De Monbreun's success, in 1932, in cultivating the causal fungus revived interest in the disease, and new cases have been reported in increasing numbers every year since. Histoplasmosis, hitherto known only in Central and North America, has recently been recognised in the East Indies and England. De Monbreun found the natural infection in a pet dog, but the saprophytic fungus has not yet been found in nature and the source of infection is uncertain. Treatment, including chemotherapy, has proved of little avail and the prognosis is bad, patients sometimes dying within a few months of infection.

* * *

Systemic mycoses have so far roused interest chiefly in countries where they are known to exist; but a search for them in other parts of the world will probably show that they are commoner than has been supposed.

NUTRITION SOCIETY

This society met on Feb. 28 at the London School of Hygiene when a discussion on

Food Production and Distribution

in relation to nutritional needs was opened by Sir Wilson Jameson, chief medical officer of the Ministry of Health. It is the Government's policy, he said, that the Minister of Food should be advised by the Minister of Health. His own duty is to watch for any deterioration in the nation's health; so far there was no evidence of anything seriously wrong. During his recent visit to America he had been impressed by the interest shown in nutrition in the United States and by the demonstration at Toronto[1] of the profound influence of prenatal diet on the health of mother and child.

Sir John Orr, F.R.S., director of the Rowett Institute, spoke of the agricultural implications of a food policy based on nutritional needs. He thinks that those engaged in medicine might learn much about infant mortality from agricultural researchers. The psychological effect of deficient diets is, he said, just as important as the physiological or pathological aspects, and he asked for a food policy based on nutritional needs as a basis of postwar reconstruction. Great increases in the production of protective foods will be needed to cover the requirements of the population. Nations should cooperate to see that foodstuffs which can be easily transported are grown in the regions where production is most economic. The foods which should be raised here are vegetables, milk, eggs and pork. Agricultural research may be able to increase the vitamin and mineral contents of various foodstuffs.

Prof. E. J. Bigwood, lately director of the Biochemical Institute in Brussels, said that Germany's food policy in occupied countries has been directed to making them self-supporting as far as calories go. This has thrown the diet entirely out of balance by exaggerating the deficiency in protective foods. It will result in European countries producing more and more of the least perishable foods, of which there are larger world surpluses; in the immediate postwar period they will have to rely on shipments from overseas of those perishable foods which should really be consumed where they are produced.

Discussing Sir John Orr's paper, Mr. T. F. Macrae, D.Sc., of the Lister Institute and the R.A.F., regretted that in the past we imported large amounts of food from countries with ill-nourished populations. He pointed out that a diet of 85% extraction bread made from imported wheat, and of milk and milk products with a good variety of vegetables would ensure adequate nutrition though it might lack flavour. Flavour however was important; the menu value of palatable foods like meat, eggs, bacon, fish, or of flavouring like onions, is probably greater than their nutritive value. Other speakers expressed concern at the shortage or destruction in our present diet of vitamins, especially vitamin C. Dr. E. Kodicek, of the Cambridge Nutritional Laboratory, thought the war-time diet near the danger point with regard to nicotinic acid, especially where white bread was consumed. He was supported by Captain J. D. King, Ph.D., of the nutritional laboratory of the National Institute for Medical Research, who had noticed lately in some London children ulcerative gingivostomatitis (trench mouth) which responded well when local treatment was supplemented by nicotinic acid or yeast. The clinical appearance of these lesions was not dissimilar to that in scurvy. Prof. H. P. Himsworth, of University College Hospital, doubted whether in peace-time the population could be persuaded to take foods and concentrates rich in accessory factors and asked for the inclusion of sufficient of those factors in the basic foods consumed in peace and war alike. Miss M. C. Broatch wished to see simple teaching of the elements of nutrition in schools so that children would understand the significance of the extra rations given in school canteens.

BETWIXT MAN AND BEAST

Mr. Norman Wright, D.Sc., director of the Hannah Dairy Institute, spoke on the rival claims of animals and man to food. In a balanced agriculture man and beast derive their nutrients from complementary sources. Livestock performs the valuable function of concentrating the available foodstuffs into a form more suited to the digestive system of man, conferring on them in the process a high value as protective foods. Animal products add variety and palatability to what would otherwise be a monotonous and insipid starchy diet. Of almost equal value from the point of view of man's food-supply is the function of livestock in improving soil fertility. This ideal balance was, however, upset before the war by the country's over-specialisation on livestock husbandry, the retrograde diversion of good arable land to grazing, and by the importation of feeding-stuffs out of all proportion to home-produced feeds. War, with its drastic curtailment of imports, has demanded an extremely rapid return to the older balanced system, and an energetic ploughing-up policy has been applied. Nevertheless the balance-sheet of animal nutrients shows that the supply of feeding cereals and concentrates has been almost halved since the war started. Dr. Wright hoped that postwar agricultural production will be more in keeping with the country's needs.

Dr. B. S. Platt spoke of the competition between man and man which inevitably results when concentrates are imported from countries which could use them themselves.

The question of avoidable waste loomed large in the discussion: waste by inefficiency or lack of proper scientific care in cultivation, loss of crops from diseases capable of control, loss of food by faulty distribution. A considerable quantity of milk had been wasted last summer through souring. Mr. W. R. Wooldridge, Ph.D., president of the National Veterinary Medical Association, commented on the lack of preventive medicine on the farm. He asked for a bold policy to maintain and improve the health of farmstock and quoted computations which showed that three diseases of dairy cattle alone—mastitis, contagious abortion and sterility—were responsible for a loss of liquid milk amounting to nearly 200 million gallons a year.

Mr. E. T. Halnan, of the Animal Nutrition Institute at Cambridge, spoke of animals as food converters, showing how difficult it is to form a reliable estimate of the relative efficiency of the different domestic animals. To begin with there is the problem of choosing the yardstick. Mr. Halnan graded livestock according to their ability to transform the protein and energy of fodders into protein and energy for human consumption. On this basis and considering the requirements of breeding and rearing as well as the production capacity of the animal he was in favour of concentrating on the production of milk with veal as a by-product, and on the production of eggs with *petits poussins* meat production as a by-product. He relegated lamb production to hill grazings and would not encourage the production of beef.

---

[1] Ebbs, J. H., Tisdall, F. G. and Scott, W. A. *J. Nutrit.* 1941, 22, 515.

Subsequent speakers agreed or disagreed with Mr Halnan's classification depending on the yardstick they used. The choice varied according to whether the amount of land required per unit output, the type of fodder consumed, the cost of the unit of energy or protein produced, or the method of book-keeping in drawing these balances of nutrients were taken as a basis of calculation. Prof. J. R. MARRACK remarked that all such economic considerations should be heavily weighted by an appraisal of the value of the animal product in human nutrition; vitamin and mineral content, biological value of the proteins, palatability and flavour are of the utmost importance. On this basis milch cows and laying hens give even better return for their food than appears from the incomplete balance sheet of energy and protein.

LOOKING AHEAD

Sir JOHN RUSSELL, F.R.S., director of the Rothamsted Experimental Station, speaking on planning for agricultural production, suggested how agriculture after the war might adapt itself to the changing and increasing nutritional needs of the nation. He foresaw a concentration on the production of milk with which necessarily would grow the production of meat; in combination with arable farming the whole of the increased requirements for liquid milk and for potatoes, 80% of the vegetables, eggs and poultry, 60% of the meat and 35–40% of the cheese could be produced at home. He advocated a system of contracts between farmers and purchasing boards on which consumers' interests would be adequately represented. Such purchasing authorities could make stipulations in regard to quality based not on market standards but on nutritional value. He quoted the example of milk for which standards, he said, were reasonably definite but already quite inadequate. Provided it contains no less than 3% fat, 8.5% solids not fat, and no extraneous additions, milk can be sold in this country with no reference whatever to dietary factors influenced by the fodder, like vitamin A, or by the handling of the milk, like vitamin C. In winter and early spring increased demands of the infant and child for certain dietary factors coincide with the lowest ebb of these substances in cow's milk. It is possible to produce winter milk approximating to summer milk in its nutritional qualities; Finland saw fit to legislate for such milk before the war and this country, he considers, should certainly do the same when the war is over.

Sir JOSEPH BARCROFT, F.R.S., in summing up, suggested that the views expressed should be placed at the disposal of Government committees. He had been brought up on the teachings of Pavlov and agreed with Macrae and other speakers that if a food was not attractive it might not be fully assimilated. He remarked that although the gravity of wastage either due to cattle disease or to deterioration of foodstuffs had been stressed not enough attention had been paid to seasonal wastage due to glut.

PHYSICAL EDUCATION IN MANY COUNTRIES

THE Ling Physical Education Association held an inter-allied open conference on wide aspects of physical education at Tavistock House on Friday and Saturday, March 6 and 7.

In his address of welcome Mr R. A. BUTLER, president of the Board of Education, said that we take too much pride in remedial measures and not enough in the maintenance of health and power. Gymnastic is the grammar of movement, necessary to make the body alert and prepared; but youth also needs heroic training—the chance of adventure and adventurous recreation. In our secondary schools physical education is largely crowded out by other subjects, thanks to the examination system; thus the vigour and strength of the adolescent is sapped. He has found, he said, more need for diplomacy in the Board of Education than in the Foreign Office, but he has managed to get a few physical training instructors released from the Forces to work with youths of the important and neglected 14–18 age-group; and he hopes for a large increase of school medical services to cover adolescents of these ages.

Count JAN BALINSKI JUNDZILL, director of the Polish Research Centre, contrasted the advantages of English education—where plans can be carried out openly in a free country—with the hard struggle of the Poles throughout the nineteenth century (when Poland was under the divided rule of Russia, Austria and Prussia) to maintain a national language, tradition and culture. There, the underground struggle for education had stimulated a sense of values in the young, and no doubt the same spirit is at work today, when the only functioning Polish school and university are over here, in Scotland.

Lieutenant JIŘI F. VRÁNEK, PH.D., formerly chief of the section of political sciences of the League of Nations Institute of Intellectual Cooperation, spoke of the relation of social welfare to physical education in Czechoslovakia. For twenty years the social policy and the realisation of the humanitarian ideals put forward by Masaryk have been advancing. In 1918 every citizen was insured against unemployment, illness and old age. There was a Ministry of Social Welfare, and the working population had gained greatly in security. Physical wellbeing was maintained by medical inspection and physical education. The Sokol gave unity to a country geographically and politically surrounded; it aimed at the physical and moral welfare of the people and welded these aims into the national organisation. The spirit in which this was done was voluntary and democratic, and the opportunities offered for recreation held no class distinctions. Discussing why the Nazi regime has gained support he said that the weak spot in nations is the gullibility of youth, and Hitler has made unscrupulous use of youth. This is what we have to counteract. He quoted Wells's phrase "young people without prospects." Peace will be planned, he hopes, to give the young prospects and to stop the cult of violence. We must aim at social reconstruction, carried out by united nations linked by a similar conception of civilised life. No full reconstruction is possible, he believes, without a spiritual revolution. Since the purpose of education is to assimilate the young into the life of the community social reforms must guard family life and foster healthy out-of-school activities.

Dr ACHSA BEAN, assistant chairman to the department of health and hygiene of Vassar College, is one of the American women doctors who have come to join the British Army. She spoke of the need for health services and physical education for those in the age-group 17–22. They are largely overlooked in legislation but they are the leaders in age of the coming generation. She described the work done at Vassar College for people in this age-group: 1200 women students, 550 employees, 250 members of the faculty and their families. These are served by five physicians and one psychiatrist. Some 40–55% of students hold scholarships. Great emphasis is laid on team-work. On admission the student is given an hour's interview with a medical overhaul including examination of posture, and intelligence and psychological tests. A real attempt is made to win the girl's interest in personal and public health. If health or posture are poor she is given corrective exercises and graduated activity. There is close cooperation between the orthopædic surgeon and the physical education department; and the students take courses in hygiene, industry, and social problems. They are encouraged to report early to the health services when they are ill. Statistics are compiled from X rays and tests made when the girl is leaving. The result has been, as at Harvard, to create an intelligent lay public anxious to promote positive health.

Lieutenant KJELD BIRKELUND, gymnastic instructor to the Norwegian Army, explained that Ling's principles—Ling of course was a Swede—were maintained with modifications in Denmark and Finland. In Oslo, the Norwegian Central Institute for physical education is attached to the university and as a rule the physical training school instructors teach two other educational subjects, generally languages. Short refresher courses are arranged for elementary school teachers. In the high schools attention is paid to posture, and the adolescent generally joins classes and clubs held after school. Physical education in the university is voluntary but classes are usually well attended. Nearly everyone between the ages of 3 and 70 can ski, skate and swim, and most people can handle a boat. The Gymnastic Association, by films and propaganda, encourages the nation to keep up physical training and sports throughout life, and small local clubs flourish all over the country

General D T **Botzaris**, former Minister of State to Greece, spoke of the influence of ancient Greek culture on modern physical education He told of the dancing, hunting, riding, poetry, science, rhetoric and philosophy of the Athenians, and the warlike heroic training of the Spartans The aim of Greek physical culture was symmetry, achieved through the graceful movements of dancing, and the vigour of wrestling Breathing was studied, and curative exercises and massage used, character was trained through physical training The Roman influence brought in brutality and decadence The influence of Greek culture was first revived in France and Sweden, and today there was a modern approach to natural development in the Anglo-American attitude We must guard, he thinks, against the sedentary habits produced by mechanisation, and against the one-sidedness of some games We must regain the symmetry of balanced form and personality

Mr A **Slavo Klemenčić** told of physical education in Yugoslavia and of the natural love of the young and old for mountaineering and skiing Early in the last war sports clubs were founded and physical training was introduced into schools, but it was unevenly distributed Later in that war the spread of the Sokol movement from Czechoslovakia roused a feeling for balance and unity, and after the war the Sokol worked for the reconstruction of national health and education People of all ages and classes were voluntarily included in the Sokol and physical training became compulsory for these up to the age of 26 It included limbering, gymnastics, and natural and athletic sports Private sports clubs also existed outside the Sokol In 1931 a Ministry of Physical Education was established and students were sent all over Europe to study methods, on their return a faculty of physical education was founded at Belgrade University By this time physical education had been made obligatory for everyone in the country under the age of 20 Training was scientific, aiming at producing neuromuscular control and improving circulation and respiration the purpose being to achieve balanced education of body, character and mind

Monsieur **Gustave Moutet**, of the editorial staff of *France*, told how the Nazis have made Borotra, the tennis champion, "director of sports and physical education" and have told him to organise France so that—in their words—"a degenerate country may become a strong state" Stadiums are to be built in the grandiose German manner, and previous sports champions—usually of cycling or boxing—are being trained as organisers or local führers The effort is falling flat, partly because tuberculosis is spreading and partly because rations are inadequate Physical training hours in schools used to be 3 a week, the Nazis ordered an increase to 7 hours, but they have finally been reduced to 2 because the children have not the strength for more It has been estimated that the calories lost by a rugby team in a match would keep the same team, living sedentarily, for 24 days In France the rations cannot support games Public health is poor, infant mortality much increased and among the 150,000 prisoners—mostly young men—tuberculosis is spreading The people have no heart for organised health as a subject nation

Miss P **Spafford**, secretary of the Ling Association, described how organised physical education in Great Britain was begun in the elementary schools on the initiative of the Swedish Mme Osterberg, she introduced the Ling system which is now modified by Finnish and Danish influence Games and playing fields have steadily increased until the war broke out School medical benefits—free meals, extra milk and cod-liver oil—have played their part She pleaded for close cooperation between the school medical officer, the physical training instructor, and the school teacher Voluntary physical training and sports among those who have left school are spreading, and experiments are being made in industry to measure the increase of efficiency produced by a course of physical training in the factory lunch hour She proposed the founding, after the war, of an international advisory bureau on physical education

Mr **Ruscoe Clarke**, F R C S, spoke of health services in the Soviet Union, where giant strides have been made since 1921 A new single unified free health service has been built up, financed from a tax on socialist agriculture and industry Preventive and curative medicine are inseparably linked, and the people are drawn into active participation in the fight for health The basic unit is the polyclinic or factory health station, which is closely linked with the hospitals, research institutes rest homes and sanatoriums Health services and opportunities for sport and exercise have built a new generation of athletes with a democratic discipline and a zest for life The youth of our own country are interested in the Soviet union, and our unity with Russia in the present struggle, he hopes, will become the basis for full cooperation in the days of peace

---

In England Now

A Running Commentary by Peripatetic Correspondents

As I dispelled the clouds of night with a cup of morning tea I was inspired to verse, or at least parody

I will arise and go now and take my weekly bath,
Two inches deep I'll have it, since coal is growing short
Sponge, loofah, brush I'll have there, yet a heart not free from wrath
My morning song fades with a snort

For I shall have no soap there for soap is rationed now
And my wife has pinched my ration to wash her pretty things
The suds that she had done with are all she will allow
La belle dame sans savon, and no bird sings

"Bad," I thought, "an Englishman could not rhyme bath with wrath, and when I mix up Yates and Keats it is time to stop" But as I padded off to curtailed ablutions I felt my slight exasperation to be not only justified but growing If the Government had shared one of my oldest hobby-horses soap would have been no problem Not only that, but a multitude of other difficulties would have been eased Smoke abatement, though an ugly term, is the answer We could have cleansed our skies years ago and gained health shining cities, lower laundry bills finer gardens smaller rates, more vitamin D in our skins, cheaper electricity and a multitude of precious chemicals, and economised in a vast deal of transport Low-temperature combustion retorts in every coalfield would have yielded us all these things and given a good smokeless fuel with gas, motor spirit, fertilisers, drugs and dyes on the side Of course, the initial cost would be high and vested interests would be affected, but the Government should not think only in terms of immediate economy Remote economy should be their especial concern But though all this has been put again and again by the smoke-abatement (I prefer "banishment") enthusiasts the best that could be achieved was a quarter-hearted permissive Act of Parliament

All this is very much in the air and does not offer any answer to our immediate problem The experiences of evacuation made many doctors realise that dirt diseases were far more widely distributed than they had dreamed Scabies and lice have achieved the distinction of *special* official attention We have been telling our shelter dwellers (and others) that they must wash to keep healthy One may well borrow an American idiom "Where do we go from here?" This is a true dilemma to which of course there is no perfect solution When I did research and found myself in difficulties with problems involving large numbers I always turned first to the gaussian curve of normal distribution for help I did so again here and found enlightenment If we draw a curve for the cleanliness of the population with the origin at the number of people who use no soap and going up to the number of people who have, say, 2 baths a day, we will find our old friend the gaussian curve distribution Our earlier insistence on cleanliness as a way to health was directed at the left-hand side of the curve, or the dirty quartile Now the weight of our teaching is aimed at the right-hand extremists the over-clean *quartile* The bulk of the population who occupy the two middle quartiles are not affected by the advice we were giving because they were already sufficiently cleanly in their habits and they will not be influenced by the advice that cleanliness can be carried to excess (It is to be hoped that they will be more economical in soap so as to avoid waste) In other words, we were right before soap rationing was introduced and we are still right in our teaching, it is all most satisfactory

This does not in any way detract from the force of the arguments for banishing smoke from British skies They are still valid, in fact even more so Grime is the opposite of cleanliness, and it must be abolished if we are to have the greatest measure of health for the people, which is our chief concern as physicians It is an important step in the establishment of a self-sufficient economy and this must be an important concern to us as citizens

* * *

What a day was that second Sunday in March! On such a one in kinder times stout men of middle age went out in cars and wondrous clothes to play golf Today no-one dons plus fours except to dig, and I am lucky that I have an alternative game of collecting hedge trimmings and cow pats for the compost heap It takes me out of doors to revel in the sun and the wind while the mild exercise warms me It swings me from the shoulder to the hip as I lift them in my barrow It gives me a mild vein of thought while leaving most of my brain to revel in the beauty of the hills far away It has a technique of its own Will this one roll or must I lift it? Can I take those two pats in one or shall I do them in two? When I go out into the rough for that long distant one shall I take my spud or must I trundle my barrow? My implements vary like the golfer's and have as vivid names This was the day for the four speen spud, but on softer ground the garden prong is better My clothes are as characteristic The trousers came from Beverley, a navvy's pair bought when I arrived there wet through, having walked from Pocklington, with a change in my rucksack of everything except my nether garments My woolly is a minus two, both elbows being gone It was bought many years ago in the Caledonian market by my old missis who says she will not allow me to wear it any more My boots came from the ordnance store in Jerusalem in 1918, and are still weather-proof My game has three advantages over golf It does not lead to undue drinking, a modest pint subserves my lunch I do not bet on my pats as the golfer does on his puts in whiskies-and-soda Nor do I hold forth later in the drawing-room about the lift with which I landed the ninth in the third load And finally, my labour is of use, for my produce will be dry in 1944 and form the potato crop in 1945

* * *

The broadcasting of health talks in this country has produced a very uneven level—comparable with the oratorical powers of the profession In the rigidly enforced need to avoid all controversy the "talks" producers seem to remove a lot of the spice of life and it would be interesting to see what the variety department of the BBC (who strangely enough produce the Brains Trust) would make of health propaganda These thoughts are prompted by a perusal of Dr Charles Hill's contributions to the Kitchen Front, now available as a pamphlet (price 3*d*), issued for the Ministry of Food by the Ministry of Information and called "Your Baby's Food in War Time—The First Year" This is fundamentally a pretty safe subject but its frills are decidedly controversial I believe that the mention of Truby King at the annual galas of the British Pædiatric Association generally provokes a riot and it would be interesting to know what this body would think of the nation's instruction in infant feeding being conducted by an assistant secretary of the BMA—i e, a bureaucrat by profession—even if quite an ordinary father in his spare time Dr Hill's style is breezy and arresting and he certainly manages to convey the elements of the subject in an intelligible manner But the necessity of being just thoroughly low-brow results in some queer statements "For every breast-fed infant that does not live, five die that are fed other ways" This is a worrying piece of prose and I should like to know the exact basis for whatever it means Then the problem of the night feed is just ignored A few lines, with advice to give cold boiled water only at night does not solve what is for many breast-feeding mothers (and their husbands) the most difficult bit of the whole business I liked Dr Hill's bottle-feeding when I listened to him originally and it reads well now The mixed feeding details came over well too—but I was puzzled at the time and I still am as to why he bans the potato until the baby is a year old while advocating spinach, sprouts cabbage, carrots and turnips at six months There is a faint suggestion in the vitamins section that raw foods are necessary for these essentials and I am not clear why it should be called "raw juice" when a mashed potato is pressed through muslin or if the operation is either feasible or necessary I can't see a working-class mother doing it anyway and there isn't the slightest need to! Which of course is being just thoroughly controversial and brings me back to where I began I'd like to hear a party of doctors and laymen conduct an unrehearsed discussion on food with no limitations on what was said I have a feeling that as a weekly event it would soon rival the Brains Trust Will the variety boys please note? They have recently given us trains reminiscing at Crewe Let's have diet debates with a home team and visiting experts

* * *

Whenever you give an anæsthetic you should feel the coroner standing at your elbow—so the anæsthetist taught at hospital Oh yes, and whenever you write a certificate a phantom G M C should be looking over your shoulder, and every time you dispense a D D you should be prepared to be cross-examined on it by a K C Tripe and stuffing! In fact, the best cross examiners in the world are doctors themselves They spend a large part of their lives in trying to extract the crystal truth from the turbid waters of deceit and verbiage and counter-tale—and in the quickest way Here's an example from an old doctor's East Anglian surgery A boy of 12 shuffled in with a hang-dog air and pointed to some scratches on his knees The old doctor knew the boy was mad on horses that the local point-to-points had been held the day before, and that the scratches were chronic He asked two questions The first was, "Who won the Hunting Farmers?" and the answer, "Young Mr Linge on the roan mare, sir" The other question was, "Certificate?" "Please," said the boy hanging his head I wonder what the G M C would have thought about that certificate "—— did not attend school yesterday by reason of his suffering from febricula equitis" They couldn't say a thing—it was true That's the way to treat these fellows who stand at your elbow, peer over your shoulder and whatnot Take 'em on under their own rules

* * *

The Poet Laureate doesn't seem to have been doing much lately I think there is a far greater need for a Laurelled Psychologist He wouldn't cost much, in fact a guinea or two and a butt of sack will do nicely thank you

Ah, *Morrison*, you wish to consult me about this squabble with the *Daily Mirror* Quite, quite, yes yes, I see your point perfectly But you know, Morrison people are getting rather the poor-fish mentality They start the day with the 7 55 talk which generally leaves them with the impression that they are very P F in the eyes of the Highest Authority, then they turn to their newspapers which compare them most unfavourably with the Russians, Serbs, Australians, &c, and later they get one or two more disguised pep talks Of course it's all right, but in toto it does have the same effect as nagging The reaction to the poor-fish mentality is naturally "Poor fish yourselves," meaning the high and mighty and particularly the political leaders And they have been able to discover, not blots, but shall we say a few punctate spots on the escutcheons of these people—you know, things like that place where they make the lager beer, and rearmament, and cadet corps, and failure to biff the black market Mind you, the whole thing is symptomatic of inaction, when we get going all this carping will disappear automatically For what it is worth, I have got one suggestion to make It's this You must have quite a lot of men whose bodies were rather smashed up at Dunkirk, in the Battle of Britain, at sea, but whose minds are perfectly all right You can't say that having no political experience they would be useless in the House and Government, because if they had belonged to certain families they'd have gone in automatically Their escutcheons are completely unpimpled Mention it to the P M? Do, Morrison Why not?

Letters to the Editor

SUTURE MATERIAL

SIR,—Your annotation (p. 320) on cotton as a suture material is timely. It has been used as a cheap substitute for linen thread in my operating theatre at the Manchester Royal Infirmary for the last few months and has proved to be reliable. At present we use Coats's no. 40, black, boiled for five minutes.

Manchester 13. —HARRY PLATT.

SIR,—It may be of interest to put on record that the late Mr. A. E. Barker, surgeon to University College Hospital was in the habit of using linen thread for all surgical work—i.e., intestinal suturing, the suturing of fascial planes and skin and the ligaturing of arteries. I was his house-surgeon in 1900 and I do not remember that we, more than others, were ever troubled by suppuration from stitches; indeed probably rather less so, for Barker was the pioneer of aseptic surgery at U.C.H. He devised a very ingenious sewing machine, as he called it. It carried three bobbins furnished with threads of varying thicknesses in the handle and at the end was an adjustable needle, so that it was unnecessary to keep threading needles during an operation.

Cardiff. D. LEIGHTON DAVIES.

PROTEIN FOR THE YOUNG

SIR,—Even in time of peace it is advisable that food should be available in accordance with individual needs. It is imperative that this should be so under war conditions. The amount of food rich in protein required varies with age (*Lancet*, 1940, i, 220)—the middle-aged and elderly require very little, while the young need a great deal. I suggested long ago that rationed food should be made available in accordance with age requirements. There can be little doubt but that insufficient intake of protein food predisposes to tuberculosis. I am sure that the wear-and-tear protein required to cover the needs of middle and old age does not exceed 1¼ oz. of protein per day (apart from hyperthyroidism). On the other hand we have never been able to determine the optimum protein requirement of the young.

I estimate that under the present rationing scheme allowing a small quantity of protein for unrationed food such as fish and fowl and for couponless rationed food the amount of first-class protein available on the average will be about 8 oz. per week, and there is at least another 8 oz. of vegetable protein which can be used. I should suggest therefore that people over 35 or 40 years of age should only receive 6 oz. of first-class protein per week and that the 2 oz. so saved should be made available to persons below this age. I feel too that a strong case could be made out for doing away with couponless meals at restaurants and hotels and for requiring coupons for fish, fowl and game; the bulk of the extra protein accruing from such arrangements should be made available to the young. To simplify matters the full cheese ration should only be given to people below the age of 35 or 40 and the quantity of milk should be larger for the latter age-group than for their elders. The rise in the incidence of tuberculosis justifies the adoption of such remedies.

Liverpool. I. HARRIS.

CARDIAC ISCHÆMIA

SIR,—In a sound and practical article on cardiac ischæmia (March 14, p. 313) Dr. J. Wilson Reid stresses the success he has achieved by the use of short-wave therapy in the treatment of conditions that he refers to as "pre-thrombosis cases" of angina pectoris and the angina of effort that may follow a coronary thrombosis. It was my privilege some years ago to study with the late Dr. Cumberbatch in the electrical department at St. Bartholomew's Hospital a group of patients suffering from angina of effort. They were treated by me with ultra high frequency (short wave) and diathermy. Followed up over a period of six months many of these patients showed marked subjective clinical improvement. They suffered less pain and were able to walk further and faster; there were, however, no uniform changes in the recorded objective signs, such as blood-pressure readings, the size of the heart or X-ray screening, and the function of the heart muscle as assessed by the electrocardiogram. Later at the St. John Clinic I found that many patients suffering from angina of effort and hypertension claimed marked relief of pain after a course of foam baths. In some of these the systolic and diastolic arterial pressure dropped markedly while the patient was in the bath, but returned to their former levels while the patient was still in the dressing cubicle. In others the arterial pressure remained unchanged. Alterations in blood volume and venous pressure were at that time not recorded. Although Dr. Reid speaks of helping "to develop collateral circulation in the heart" we do not know the mechanism that underlies the subjective improvement in these patients. This is another aspect of medicine in which investigation by a team should prove of value. In this instance, the physicist, the cardiologist and the physiotherapist might combine to investigate the value of ultra high frequency and other physical measures in the treatment of cardiovascular diseases.

Devonshire Place, W.1. FRANCIS BACH.

DOSAGE OF INSULIN

SIR,—Is there not a simpler way than Dr. Walther suggests of making the dosage of insulin less liable to the regrettable errors of single, double, and quadruple strength? Could not all insulin be standardised to double strength, and syringes marked to correspond? Zinc-protamine insulin has, as far as I know, always been so standardised, and I have heard no complaints on that score. Very large doses, say 100 units, represent only 2·5 c.cm., which is no great bulk for one injection. If it represents more than one syringeful, surely it is easy to refill the syringe by another needle, leaving the injecting needle in position; the risk of considerable air embolism must be negligible. Very small doses are of questionable value, and some minor inaccuracy would hardly matter in such an inaccurate art as medicine. The risk of confusion however is large—I have met several trained nurses who were quite unclear about this matter—and it seems that in order to avoid the great risk we must, if need be, introduce minor inaccuracy or inconvenience.

Caversham. E. J. W. BARNARD.

MOVEMENT OF FOREIGN BODIES IN THE TISSUES

SIR,—Foreign bodies such as pins and needles are popularly believed to move from their site of entry in the tissues. In his paper "Missiles as Emboli," Sir John Bland-Sutton discussed the travelling of projectiles or fragments of such which have penetrated blood-vessels, but this appears to be a different mechanism from that operative in the case of pins and needles, which are thought, for the most part, to wander comparatively superficially. On Nov. 15, 1802 the celebrated Lettsom spoke of an old lady who sat on a needle while riding in a hackney coach; it passed from the injured leg to the other one, whence it was extracted (Gould and Pyle 1897, who also state that the wanderings of pins and needles in the body are quite well known). Prof. Grey Turner tells me of a case where a needle which entered the hand was found under the pectoral muscle of the same side.

Having recently removed the eye-end of a sewing needle from inside the theca, where it lay among the nerve-roots of the cauda equina I have been interested in the question of how and when it got there. The patient, now aged 21, rolled on the floor when 4 years of age. A needle entered his back and broke off, and an attempt made at the time to remove the embedded piece failed. As symptoms appeared only recently, one wonders whether these may have been due to a recent excursion of the needle, though other possibilities suggest themselves—e.g., the needle was heavily encrusted with rust.

From some correspondence with the ever-helpful librarian of the Royal Society of Medicine, it would appear that but few cases are on record of pins and needles having travelled in the tissues, though such wandering is widely believed to take place. I should be grateful therefore if your readers will advise me of any experience of such cases which has come to their notice.

Cardiff. LAMBERT ROGERS.

SUBCONVULSION THERAPY

SIR,—May I draw attention to a new form of electric shock therapy, designed for the treatment of mental disorders which, owing to the presence of one or more of the many contra-indications are unsuitable for the usual convulsion therapy ? Subconvulsion therapy is almost without risk and can be applied to patients of any age, with or without physical disease It is painless, the patient does not lose consciousness and is only aware that " something " happens to him

The procedure is similar to the usual treatment, but care is taken that the patient *suffers no convulsion* The instrument is set to give 115 volts and the time switch is set at 0 15 second From five to twenty shocks are administered, the patient lying extended on the bed After treatment the patient can get up immediately and walk unaided from the room The treatment can be given twice weekly The results so far have been gratifying, and improvement may be noticed after very few treatments , sleep is procured, weight put on and faulty habits are corrected The treatment is specially recommended for patients above the age of 60, and the presence of cardiovascular disease is no contra-indication No great strain is thrown on the patient, and as there is no major convulsion no complications need be feared

Peckham House PHILIP E F FROSSARD

SIR D'ARCY POWER

SIR,—With the approval of his son, Air Commodore Power, I am collecting material for a life of the late Sir D'Arcy Power I shall be very grateful if any of your readers who possess letters from Sir D'Arcy will lend them to me for copying and immediate return

Royal College of Surgeons of England,
Lincoln's Inn, W C 2

W R LEFANU,
Librarian

ROYAL SOCIETY

THE following have been elected to the fellowship of this society J H Burn, M D professor of pharmacology, University of Oxford , F M Burnet, M D , assistant director of the Walter and Eliza Hall Institute for Medical Research, Melbourne , Malcolm Dixon, lecturer in biochemistry, University of Cambridge , E C Dodds, M D Courtauld professor of biochemistry in the University of London at the Middlesex Hospital , A Fage, principal scientific officer in the aerodynamics department of the National Physical Laboratory , N Hamilton Fairley M D consulting physician, 2nd A I F , colonel A A M C , physician and director of special research to the Hospital for Tropical Diseases, London , P Hall, lecturer in mathematics, University of Cambridge , C S Hanes, senior scientific officer, Low Temperature Research Station, Cambridge , G H Henderson, professor of mathematical physics, Dalhousie University, Halifax , T P Hilditch, professor of industrial chemistry, University of Liverpool , Edward Hindle, regius professor of zoology, University of Glasgow , Arthur Holmes, professor in geology, University of Durham , D M Newitt, assistant professor in chemical technology in the University of London at the Imperial College of Science , C C Paterson director of the research laboratories of the General Electric Co , J K Roberts, assistant director of research at the Colloid Science Laboratory, University of Cambridge , H W B Skinner, Wills research fellow and lecturer in spectroscopy, University of Bristol , David Thoday, professor of botany, University College Bangor, A R Todd, professor of chemistry, University of Manchester , A E Trueman, professor of geology, University of Glasgow , A H Wilson lecturer in mathematics, University of Cambridge

---

A DIVISION OF CHILD CARE —The Board of Education has set up a division of child care under Mr C W Maudslay, formerly principal secretary of the medical branch of the board Mr Maudslay will have the help of Dr Dorothy Llewllin, a medical officer of the board The new division will take over responsibility, in collaboration with the Ministry of Health, for war-time nurseries, hitherto the work of the elementary and medical branches of the board It will also deal with nursery classes in public elementary schools, the recruitment and training of staff for the nurseries, and the care of workers' children before and after school hours at play centres

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS M P

THE House has been engaged this week on a coal situation debate, an agriculture debate and a number of other issues including the hours of work of young people between 14 and 18 years of age There have been fire works about other matters, the warning to the *Daily Mirror*, for instance, and the appointment of Mr R G Casey to be minister of state representing the Cabinet in the Middle East And there have been questions on the lack of medical benefit for elderly persons entering insurable employment above the insurance age, and on silicosis and tuberculosis at the Tarkwa mines on the Gold Coast All these matters reflect different aspects of the strain placed on the physique of men and women at work under war conditions And the discussions show that Parliament is alive to the importance of health although it is often not given very full information

The most acute clash of opinion during the week was on the problem of absenteeism among coal miners Sir Waldron Smithers made a long speech which was in effect an attack on the miners for not pulling their weight But he was contradicted both by mine owners and representatives of the mine-workers Mr David Grenfell, the secretary for mines, in his opening statement, said that eight special inspectors had been appointed to inquire into the increase in the number of fatal accidents due to falls at the working face They had been successful with the cooperation of managements and workers in reducing the figure from 10 5 deaths per week in the first half of 1941 to 7 7 deaths during the last ten weeks Over 75,000 miners have been called up and the older men who replace them are not all up to the standard of the abnormally hard work at the coal face Cases were quoted where men lost 8 lb in weight during one shift

Another way in which the difference in physical efficiency comes out is that while only 7½% of men have been taken from the industry, the output is down by 15% Of course there are other factors—choice of coal seams to be worked and voluntary absenteeism The men are, it is agreed, working hard, but older and less fit men cannot stand the strain of continuous labour over long periods and find they must have rest It has always been a privilege of the miners to take a spell off when they wanted it A vivid light was cast on working conditions by Mr George Griffiths, the miners' representative for Hemsworth, who himself worked for twenty-five years in the pits He told of a miner who had been fined by the production committee although he had been so little at home that his own children did not know him Mr Griffiths declared the work of a miner at the coal face is the hardest work because it is piece work, which means that a man leaves his blood in the pit and it is at the coal face that sickness absenteeism is highest

Major A N Braithwaite, a coal-owner, spoke of a man killed in his own mine three or four days before " The next day the shift came in and got on the job of clearing up a dangerous place When we realise that the miner is exposed to these dangers, we ought to be tolerant with him and help him in every way "

* * *

The strains on the productive worker need good food and the Ministry of Agriculture is doing a very fine piece of work in getting this out of our own land In addition to the farms of the country there are 1,750,000 allotments and 2–3 million private gardens making valuable contributions to the war effort We are now according to Mr Hudson, the most highly mechanised farming country in Europe In winding up, Mr Tom Johnston, Secretary for Scotland, said that it was the food front which cracked in Austria and Germany in the last war " It is not going to crack here "

* * *

Mr Kenneth Lindsay brought up another important aspect of the strain on the nation's man-power in connexion with the employment of young people between the ages of 14 and 16 Mr Rhys Davies had brought up the question of the long hours of employment of 17-year-old boys at Huddersfield Another aspect of the problem is the high pay which some youths are getting

But the real evil is the excessive hours which the wages represent and which are being taken as it were out of the national health capital. Young people under 16 may now be employed for 53 hours a week in the pottery industry and for 52 in the cotton industry. Hours of work in clubs and hotels and some other occupations are not controlled and are often excessive. These hours involve absenteeism from any kind of educational work and, as Mr Lindsay said "you cannot ask a young fellow to work 60 or more hours a week and then to join the Air Training Corps" He added very truly, "We have heard much about blue prints and new orders, but the future of Britain is between the ages of 14 and 18 or else at school" Another member raised the question as to whether these long hours were always given to work useful to the nation. Mr J H Martin regarded this employment of young people as "most detrimental to their health their physique and their psychological and mental outlook. The remedy would seem to be an extension of school medical supervision to cover the age-groups up to 18 and a rigid control of their employment to nationally essential work.

QUESTION TIME

Juvenile Hours of Work

Mr Rhys Davies asked the Minister of Labour how many orders under the Factory Acts have been issued allowing young persons to be employed up to 52 hours per week, the date of issue in each case, the several industries they cover, the approximate number of young persons affected, and whether any steps are taken to record any deleterious effects on the mental and physical standards of those young persons?—Mr E Bevin I have made two orders, dated Dec 23 and Feb 5 last, under which working hours up to 52, or in the former case, 53, can be authorised for young persons under 16 as well as for older persons. They apply to the pottery and cotton-spinning industries respectively. The orders cannot, however, be used at any particular factory unless permission to do so has been obtained from the district factory inspector, and I have no figures as to the present numbers of such permissions, though I shall be receiving returns shortly. The permissions do not relate to any specified numbers of young persons. The working of the orders is being closely watched.

Mr H. Sutcliffe Is the Minister satisfied that such an order is necessary for the furtherance of the war effort? If it is found to be harmful to the health of these young people, will he take steps to withdraw it?—Dr Edith Summerskill. Are these young persons medically examined before the factory inspector asks them to undertake these long hours?—Mr Bevin: I would like notice of that question.

Mr Kenneth Lindsay asked the Minister what reasons prompted him to agree to an order extending the hours of young workers in the cotton industry?—Mr Bevin I was satisfied that war requirements of various kinds necessitated longer hours of work in cotton spinning mills and representatives of both sides had agreed to increase them up to 52, on the basis that the new scheme of hours would apply irrespective of age. In view of the extent to which this industry is organised with assistants under 16, I decided that I could not exclude them from the order permitting the longer hours for others working with them.

NHI for Elderly Workers

Mr J J Tinker asked the Minister of Health whether he is aware that where men and women over the age of 65 years and 60 years respectively have entered industry through war emergencies who were never insured, the employer is called upon to pay his part of contributions, but the workers cannot claim medical benefit or treatment because they have not previous insurance and will he examine the position so that they can be brought in line with other workers of similar age and be allowed medical benefit treatment?—Mr E Brown The great majority of these elderly workers were already insured on reaching the ages in question and they remain entitled to medical benefit by virtue of contributions at the ordinary rates paid both by and in respect of them up to those ages. As regards the minority of such elderly workers who have had no such ordinary contributions paid, I am afraid that it would not be practicable to provide them with medical benefit within the framework of the existing scheme.—Mr Tinker Could not something be done to give them that opportunity of getting medical benefit when they enter industry to help the war effort?—Mr Brown The arrangements whereby there is built up a scheme for the provision of medical benefit for these elderly workers are complicated. It is not easy to fit this class of person into the existing scheme.

Nurses Needed

Mr R W Sorensen asked the Minister of Health whether he has ascertained the approximate number of extra nurses now required by civilian hospitals to provide reasonable relief to existing overworked staffs and secure effective medical and nursing attention to patients whether he can state the present average ratio of beds to nurses in these hospitals; and whether he will obtain information respecting the number of nurses at military or other hospitals who are not immediately necessary to those institutions but might be available for transfer to understaffed civilian hospitals?—Mr Brown The returns received from hospital authorities in England and Wales indicate the number of additional nurses whom they would be ready to employ if they were available. The figure on this basis for nursing staff of all grades is 13,600. The average ratio of nurses employed to all beds is 24 nurses per 100 beds, the average ratio of nurses employed to all patients is 40 nurses per 100 patients. I am in communication with the Secretary of State for War.

Advisory Committee on Child Welfare

Mr Brown replying to Miss I Ward said that on the special question of the care of young children he had established an informal circle of interested women. In view of the special importance of problems affecting the care of young children in war-time and the new questions which arise in relation to Government policy, he has decided to extend these arrangements and put them on a more formal footing. He is therefore establishing a committee to advise him on questions affecting the welfare of young children. He is consulting the appropriate organisations and hopes to make an announcement as to the Constitution of the committee at an early date.

Juvenile Offenders

Mr S J Peters asked the Home Secretary whether having regard to the increase in juvenile offenders for whom there was now no accommodation in existing institutions he would appoint a committee to consider and advise him of any alterations in the law or method of dealing with juvenile offenders, especially during the period of the present war or consider drafting these young offenders during the present emergency into the services, voluntary or otherwise, and thus be subject to discipline and control and in this way find an outlet for their activities.—Mr H Morrison replied The lack of accommodation in institutions is due mainly to the absence of suitable premises and the difficulty of building under war conditions, but I am glad to say that the position is now more satisfactory. Many new approved schools have been opened, or are in process of being opened, and I hope that the number of those awaiting vacancies will soon be substantially reduced. The increase in the number of juvenile offenders since the war began, as pointed out in the joint memorandum issued in June, 1941, by the then President of the Board of Education and myself, is due mainly to social disturbances and other war conditions and the most hopeful means of counteracting these influences would appear to lie in constructive measures. The Government is fully aware of the value of giving older boys and girls some opportunity of service to their country, and every means of doing so is continually under consideration. The measures taken by the Board of Education to organise and develop the Youth Service, on the lines described in the memorandum already referred to, continue to yield good results and they are being greatly strengthened by the decision that boys and girls between 16 and 18 are to register with the object of bringing them within the influence of the various youth organisations whether Cadets, A T S, Home Guards or civilian organisations, and particularly of employing their spare time on training in service for the nation. Arrangements are already in existence for maintaining close contact between my Department, the Board of Education, the Local Education Authorities and the voluntary organisations for the purpose of developing measures for dealing with this problem, and I do not think that the appointment of another committee at the present time would be the most helpful or speedy method of securing progress.

Dental Treatment for Recruits

At least 80% of recruits to the Army need dental treatment on enlistment, and full provision has been made for this by

SUBCONVULSION THERAPY

SIR,—May I draw attention to a new form of electric shock therapy, designed for the treatment of mental disorders which, owing to the presence of one or more of the many contra-indications, are unsuitable for the usual convulsion therapy ? Subconvulsion therapy is almost without risk and can be applied to patients of any age, with or without physical disease It is painless, the patient does not lose consciousness and is only aware that "something" happens to him

The procedure is similar to the usual treatment, but care is taken that the patient *suffers no convulsion* The instrument is set to give 115 volts and the time switch is set at 0 15 second From five to twenty shocks are administered, the patient lying extended on the bed After treatment the patient can get up immediately and walk unaided from the room The treatment can be given twice weekly The results so far have been gratifying, and improvement may be noticed after very few treatments, sleep is procured, weight put on and faulty habits are corrected The treatment is specially recommended for patients above the age of 60, and the presence of cardiovascular disease is no contra-indication No great strain is thrown on the patient, and as there is no major convulsion no complications need be feared

Peckham House PHILIP E F FROSSARD

SIR D'ARCY POWER

SIR,—With the approval of his son, Air Commodore Power, I am collecting material for a life of the late Sir D'Arcy Power I shall be very grateful if any of your readers who possess letters from Sir D'Arcy will lend them to me for copying and immediate return

Royal College of Surgeons of England,
Lincoln's Inn, W C 2

W R LEFANU,
Librarian

ROYAL SOCIETY

THE following have been elected to the fellowship of this society J H Burn, M D, professor of pharmacology, University of Oxford, F M Burnet, M D, assistant director of the Walter and Eliza Hall Institute for Medical Research, Melbourne, Malcolm Dixon, lecturer in biochemistry, University of Cambridge, E C Dodds, M D Courtauld professor of biochemistry in the University of London at the Middlesex Hospital, A Fage, principal scientific officer in the aerodynamics department of the National Physical Laboratory, N Hamilton Fairley M D consulting physician, 2nd A I F, colonel A A M C, physician and director of special research to the Hospital for Tropical Diseases, London, P Hall, lecturer in mathematics, University of Cambridge, C S Hanes, senior scientific officer, Low Temperature Research Station, Cambridge, G H Henderson, professor of mathematical physics, Dalhousie University, Halifax, T P Hilditch, professor of industrial chemistry, University of Liverpool, Edward Hindle, regius professor of zoology, University of Glasgow, Arthur Holmes, professor in geology, University of Durham, D M Newitt, assistant professor in chemical technology in the University of London at the Imperial College of Science, C C Paterson director of the research laboratories of the General Electric Co, J K Roberts, assistant director of research at the Colloid Science Laboratory, University of Cambridge, H W B Skinner, Wills research fellow and lecturer in spectroscopy, University of Bristol, David Thoday, professor of botany, University College, Bangor, A R Todd, professor of chemistry, University of Manchester, A E Trueman, professor of geology, University of Glasgow, A H Wilson, lecturer in mathematics, University of Cambridge

---

A DIVISION OF CHILD CARE —The Board of Education has set up a division of child care under Mr C W Maudslay, formerly principal secretary of the medical branch of the board Mr Maudslay will have the help of Dr Dorothy Llewillin, a medical officer of the board The new division will take over responsibility, in collaboration with the Ministry of Health, for war-time nurseries, hitherto the work of the elementary and medical branches of the board It will also deal with nursery classes in public elementary schools, the recruitment and training of staff for the nurseries, and the care of workers' children before and after school hours at play centres

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS M P

THE House has been engaged this week on a coal situation debate, an agriculture debate and a number of other issues including the hours of work of young people between 14 and 18 years of age There have been fire works about other matters, the warning to the *Daily Mirror*, for instance, and the appointment of Mr R G Casey to be minister of state representing the Cabinet in the Middle East And there have been questions on the lack of medical benefit for elderly persons entering insurable employment above the insurance age, and on silicosis and tuberculosis at the Tarkwa mines on the Gold Coast All these matters reflect different aspects of the strain placed on the physique of men and women at work under war conditions And the discussions show that Parliament is alive to the importance of health although it is often not given very full information

The most acute clash of opinion during the week was on the problem of absenteeism among coal miners Sir Waldron Smithers made a long speech which was in effect an attack on the miners for not pulling their weight But he was contradicted both by mine owners and representatives of the mine-workers Mr David Grenfell, the secretary for mines, in his opening statement, said that eight special inspectors had been appointed to inquire into the increase in the number of fatal accidents due to falls at the working face They had been successful with the cooperation of managements and workers in reducing the figure from 10 5 deaths per week in the first half of 1941 to 7 7 deaths during the last ten weeks Over 75,000 miners have been called up and the older men who replace them are not all up to the standard of the abnormally hard work at the coal face Cases were quoted where men lost 8 lb in weight during one shift

Another way in which the difference in physical efficiency comes out is that while only 7½% of men have been taken from the industry, *the output is down by* 15% Of course there are other factors—choice of coal seams to be worked and voluntary absenteeism The men are, it is agreed, working hard, but older and less fit men cannot stand the strain of continuous labour over long periods and find they must have rest It has always been a privilege of the miners to take a spell off when they wanted it A vivid light was cast on working conditions by Mr George Griffiths, the miners' representative for Hemsworth, who himself worked for twenty-five years in the pits He told of a miner who had been fined by the production committee although he had been so little at home that his own children did not know him Mr Griffiths declared the work of a miner at the coal face is the hardest work because it is piece work, which means *that a man leaves his blood in the pit* and it is at the coal face that sickness absenteeism is highest

Major A N Braithwaite, a coal-owner spoke of a man killed in his own mine three or four days before "The next day the shift came in and got on *the* job of clearing up a dangerous place When we realise that the miner is exposed to these dangers, we ought to be tolerant with him and help him in every way"

* * *

The strains on the productive worker need good food and the Ministry of Agriculture is doing a very fine piece of work in getting this out of our own land In addition to the farms of the country there are 1,750,000 allotments and 2–3 million private gardens making valuable contributions to the war effort We are now, according to Mr Hudson, the most highly mechanised farming country in Europe In winding up, Mr Tom Johnston, Secretary for Scotland, said that it was the food front which cracked in Austria and Germany in the last war "It is not going to crack here"

* * *

Mr Kenneth Lindsay brought up another important aspect of the strain on the nation's man-power in connexion with the *employment* of young people between the ages of 14 and 16 Mr Rhys Davies had brought up the question of the long hours of employment of 17-year-old boys at Huddersfield. Another aspect of the problem is the high pay which *some* youths are getting

Obituary

GUTHRIE MORGAN WADSWORTH

M B LEEDS, CAPTAIN R A M C

Dr G Morgan Wadsworth whose death on Jan 16 occurred while on service abroad was the son of Mr J Morgan Wadsworth London editor of the *Yorkshire Evening Post* He was educated at Silcoates School Wakefield and entered the Leeds medical school in 1917 He took his degree in 1923 winning the Hardwicke prize for medicine and was appointed first house-physician at the Leeds General Infirmary The following year he took the conjoint qualification and started in practice at New Brancepeth co Durham and later he also worked at Waltham in Lincolnshire and in Croydon When war broke out he was in practice at Blackheath but he at once joined up He was stationed in the West Country until last November when he was posted abroad One of his friends writes ' As a student Wadsworth was enthusiastic and meticulous, as a colleague he was loyal and helpful · as a physician kindly and wise and as a friend faithful and thought-provoking He had the invincible innocence of an unsuspicious nature and his patients as well as his friends paid him not only respect but affection '

PETER NORMAN WITNEY

B A CAMB M R C.S, CAPTAIN R A M C

[illegible]

AN officer who escaped from Kowloon has reported that Captain P N Witney has been killed in Hong-Kong by the Japanese Peter Witney was the son of Dr E W. Witney of Whitstable and was educated at Tonbridge School and St John s College Cambridge He qualified from St Thomas s Hospital where his father had been before him and his brother was to follow him and after qualifying in 1937 he held clinical assistantships in the pathological and children's departments The following year he became house-physician at Torbay Hospital Torquay He joined the RAMC at the beginning of the war and since then had served in the Far East.

Medical News

Medical Casualties

Surgeon Lieutenant J C Wyatt M.R C S, R.N, H.M.S *Exeter*, has been reported missing after the battle of the Java Sea, and Major John Officer M.B Edin., R A.M.C missing at Hong-Kong T/Surgeon Lieutenant Sidney Lewis Binderman, M.B Camb, R N V R. H.M.S *Vortigern*, son of Dr N T Binderman of Brooklyn, N Y, is posted as ' missing presumed killed. '

Course on Industrial Medicine in London

A weekend course on health in the factory for medical practitioners will be held at the London School of Hygiene, Keppel Street, W C 1, on April 18 and 19 The proceedings will be opened by Dr J C Bridge and the lecturers will include Dr R E. Lane (toxic risks), Dr M. W Goldblatt (occupational skin disease) Dr Donald Stewart (factory hygiene) Mr Paul Moffatt (ophthalmology in relation to industrial medicine) and Dr Joan Harwood (women in industry) Further particulars may be had from the secretary of the school

Royal Society of Medicine

The section of history of medicine of this society will meet at 2 30 P M on Wednesday, April 1 when Dr A P Cawadias will read a paper on the art of diagnosis in its historial development At 4 30 P M, on the same day at the section of surgery, Prof R S Pilcher and Mr F W Holdsworth will open a discussion on the first principles of wound treatment

Tuberculosis Association

A meeting will be held at 10 30 A M on Saturday, April 18 at 26 Portland Place London W 1 to discuss the report of the subcommittee which met under the chairmanship of Dr A. S Hall to consider the provisions for the rehabilitation of the tuberculous made in the Ministry of Labour s interim scheme

British Orthopædic Association

The spring meeting of this society will be held in Liverpool on May 29 and 30 under the presidency of Mr G R Girdlestone The programme will include discussions on delayed union of fractures in the lower limb and a comparison of Canadian and British experience of methods of amputation in the lower limb There will also be a visit to an R A.F rehabilitation centre

Robert Jones Medal and Association Prize —No award has been made for the year 1941

Royal National Throat Nose and Ear Hospital

The following lectures which will be held at this hospital on Fridays at 4 P M, are open to any member of the medical profession Mr Lionel Colledge malignant disease of the larynx (April 10) Mr F W Watkyn Thomas malignant disease of the sinuses (April 24) Mr A R Dingley, treatment of chronic otorrhœa) (May 15) Mr C Gill Carey, the differential diagnosis of ulcers and membranes of the pharynx (May 29) : and Mr J D McLaggan tuberculosis of the larynx (June 4)

The death is reported from Berlin of Prof Kurt Brandenburg editor of the *Medizinische Klinik* since its foundation in 1905

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export

Births, Marriages and Deaths

BIRTHS

BANHAM.—On March 18 at Northampton the wife of Mr Ro Banham F R.C.S —a son

CLAYTON-JONES—On March 22, in Aylesbury the wife of Dr E Clayton Jones—a son

CRACKNELL.—On March 10 at Leicester the wife of Dr D G Cracknell—a son

CRUTCHLOW—On March 17 at Inverness the wife of Surgeon Lieut -Commander Everett F Crutchlow R.C N V.R.—a son

ELLIOTT—On March 18 in London the wife of Dr W A Elliott, of Glazbury Road W 14—a daughter

JACK.—On March 16 at Woking, the wife of Captain R. D S Jack R.A.M C.—a daughter

JAMES—On March 21 at Aberdare the wife of Surgeon Lieutenant-Llywelyn James R.N V R.—a son

LEDLIE.—On March 19 in London the wife of Mr Reginald Ledlie F R C S—a son

NUTTALL-SMITH.—On March 21 at Oxford the wife of Captain John Nuttall-Smith R.A.M C—a son

READ—On March 17 in London Dr Edna Read (nee Wilson), wife of Mr Charles Read F R.C O G—a son

THOMPSON—On March 21 at Esher the wife of Captain J R. O Thompson, R.A M.C—a son

DEATHS

ADAMS—On March 19 Francis Philip Adams M.R C.S of Shepherd Market, London W 1

BATCHELOR.—On March 11 in Dunedin New Zealand Ferdinand Stanley Batchelor F R.C.S

BELL.—On March 18, at Crouch End, London N 8 Andrew Farm Bell M.B. GLASG

DEVEREUX.—On March 17 Arthur Cecil Devereux F R.C.S of Malvern

ELLIOTT—On March 20 at Northampton Alfred Charles Elliott M.B. DUBL. lieut -colonel R.A.M C retd. aged 60

HERBERT—On March 19 H Herbert, F R.C.S lieut -colonel I.M.S retd of West Worthing aged 77

LLOYD—On March 16 in London Frederic George Lloyd, F R.C.S E

MENZIES—On March 20 at Folkestone James Adie Menzies M.B EDIN

NOBLE—On March 19 William Henry Francis Noble L.S A of Knuston Hall Wellingborough formerly of Sittingbourne Kent aged 75

ROBERTS—On March 15, Astley Carrington Roberts L.R.C.P, of Badlesmore Eastbourne

THURSTON—On March 16 Edward Owen Thurston M.B LOND, F R.C.S, lieut -colonel I.M.S retd the expansion of the Army Dental Corps and the provision of extra Army dental centres and laboratories and mobile dental units [Mr E D SANDYS replying to Mr T E GROVES]

Illegitimate Births

Mr BROWN in answer to a question gave the following as the number of illegitimate births in England, Wales and London for the years 1939 and 1941

	1939	1941
England	24,540	28,740
Wales	1402	1713
London	3105	1931

New Treatment for Wounds

Mr B V KIRBY asked the Under Secretary of State for War if he could give any information about the new treatment for wounds discovered by a doctor of the Hebrew University in Jerusalem, and whether it was to be adopted generally throughout military hospitals in the treatment of wounds — Mr SANDYS replied This work has not yet passed the experimental stage and there can therefore be no question at present of adopting its results generally. Steps have however been taken to give the doctor referred to assistance in his experiments

Medical Inspection of Irish Labourers

Sir PERCY HURD asked the Minister of Health whether, in view of the arrival in Wiltshire and other areas, where Government construction was in progress, of Irish labourers who were verminous and suffering from infectious diseases, strict medical inspection had now been instituted at Dublin, Belfast and other exit ports before these migrants were allowed to leave Ireland —Miss F HORSBRUGH replied I understand from the Minister of Labour that no such arrangements are in operation, but that under the arrangements by which labour is now being engaged in Eire on behalf of civil engineering firms medical examination is carried out before engagement in the case of workers coming from certain urban areas Sir P HURD Does that apply to Northern Ireland?—Miss HORSBRUGH There is no regular system of examination of workers in Northern Ireland In some cases they are examined in their home areas —Sir P HURD Does not the Minister think that method is very unsatisfactory and incomplete ? Can we not have a complete inspection of these people ?—Miss HORSBRUGH The engaging of labour is entirely a matter for the Ministry of Labour The Ministry of Health have no control over what is happening in Eire or Northern Ireland I understand that the Minister of Labour is arranging about these workers

Silicosis on the Gold Coast

Mr H MACMILLAN, the Under Secretary of State for the Colonies, in reply to a question stated that two medical officers of the Gold Coast medical service undertook an investigation into the incidence of tuberculosis and silicosis amongst mine-workers in the Tarkwa area between April, 1940, and January, 1941 Their interim report reveals that considerable progress has been made with the investigation of this problem Arrangements were subsequently made for one of the medical officers, who is a specialist in these diseases, to visit South Africa to obtain the advice of the authorities in Johannesburg Before adequate preventive measures can be introduced, it is necessary to obtain fuller information regarding the dust counts of the atmosphere at the various working places, and arrangements have been made for officers of the mines department to receive instruction in this subject The report showed that the incidence of pulmonary tuberculosis was higher than that of silicosis and suggested that it was a much greater menace to the health of mine employees The medical officer has now been freed from all routine duties to allow him to devote his full time to the investigation of the incidence of tuberculosis All known cases of these diseases are receiving the necessary treatment, but the elimination of silicosis must of course depend on methods of prevention

Welfare Schemes in British Guiana

Replying to a question Mr MACMILLAN said that the following schemes submitted by British Guiana under the Colonial Development and Welfare Act had been approved appointment of a malariologist, extension of campaign against yellow-fever mosquito, medical service for the aboriginal Indian population, material for health education instruction, equipment for a venereal diseases clinic, apparatus for the diagnosis of tuberculosis

Nursing in the Colonies

Dr H B MORGAN asked the Under Secretary of State for the Colonies whether any plans for a composite complete colonial nursing course for the training in Great Britain of Europeans bent on a colonial nursing course or of colonial born nursing students of any race or colour had yet been considered by the Colonial Office in planning for future colonial nursing services, whether hospital associations or local authorities in Great Britain had ever been approached on a considered scheme, and whether he could make any statement on a future colonial nursing policy —Mr MACMILLAN replied Active steps are being taken regarding the planning of appropriate training of European women for work in colonial medical and health services as well as that of colonial born students of any race or colour as nurses, midwives and health visitors As these schemes are not complete, the second part of the question does not yet arise A full statement on future colonial nursing policy must await completion of this preliminary work

Mr R W SORENSEN asked whether Mr Macmillan was aware that fully-qualified West African nurses were unable to secure posts as sisters or matrons in West African hospitals, whether he proposed to take any steps to remove this colour disqualification, and whether he was considering proposals to revise hospital administration so as to encourage and permit suitably trained and qualified West Africans to secure any medical or administrative post in their own country —Mr MACMILLAN It is the declared policy of Government that there should be no discrimination on the ground of colour in filling appointments in the Government service in West Africa It is true that no African nurses have so far been appointed as sisters or matrons in West African Government hospitals, but there is no rule which debars them from obtaining these higher appointments as suitable candidates become available Continuous efforts are being made to ensure to West Africans careers commensurate with their talents, training and qualifications

---

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED MARCH 14

Notifications —The following cases of infectious disease were notified during the week smallpox, 0, scarlet fever, 1260, whooping-cough, 1324, diphtheria, 842 paratyphoid, 6 typhoid, 16, measles (excluding rubella), 2706, pneumonia (primary or influenzal), 1403 puerperal pyrexia, 194, cerebrospinal fever, 230, poliomyelitis, 3, polio-encephalitis, 2, encephalitis lethargica, 1, dysentery, 131, ophthalmia neonatorum, 71 No case of cholera, plague or typhus fever was notified during the week

The number of civilian and service sick in the Infectious Hospitals of the London County Council on March 11 was 1433, including scarlet fever, 142, diphtheria, 210, measles, 87, whooping cough 181, enteritis, 72 chicken pox, 49, erysipelas, 37, mumps, 64 poliomyelitis, 1, dysentery, 39, cerebrospinal fever 31, puerperal sepsis, 28, enteric fevers, 8, german measles, 1, encephalitis lethargica, 1, other diseases (non infectious) 98, not yet diagnosed, 81

Deaths —In 126 great towns there were no deaths from enteric fevers or scarlet fever, 3 (0) from measles, 9 (2) from whooping-cough, 18 (0) from diphtheria 26 (1) from diarrhœa and enteritis under 2 years, and 81 (10) from influenza The figures in parentheses are those for London itself

Fatal cases of influenza were scattered over forty five towns, Leeds reporting 5

The number of stillbirths notified during the week was 254 (corresponding to a rate of 41 per thousand total births), including 23 in London

---

NATIONAL SOCIETY OF CHILDREN'S NURSERIES —The National Society of Day Nurseries is continuing its work under this new name which covers more adequately the scope of the work it is doing today For many years residential as well as day nurseries had affiliated with the society, but when most of the day nurseries were evacuated and became residential, the plea that the name should be changed became urgent To help and advise local authorities on the training of staff, setting up and running of nurseries, and on the training of staff, four technical advisers have been appointed This expansion was made possible by financial help received from the British War Relief Society of the United States of America

BIOLOGICAL VALUE OF THE PROTEINS CONTAINED IN WHEAT FLOURS

HARRIETTE CHICK, C.B.E., D.SC. LOND. AND MANC.

(Division of Nutrition, Lister Institute)

THE wheat kernel consists of three parts, the bran or seed coats, the endosperm, and the embryo or germ, representing about 15%, 83·5% and 1·5% of the grain (Girard 1897, Wiley 1898, quoted by Osborne et al. 1919b). The protein content of the whole grain (nitrogen × 5·7) may vary from 10% to 16%, that of the embryo from 30% to 40%. In the milling of wheat white flour is prepared by mechanical separation of the starchy endosperm of the grain, leaving the embryo and bran. The outer layer of cells of the endosperm, filled with the protein-rich aleurone grains, and a variable amount of the starchy endosperm adhere to the bran and are removed with it.

In an average wheat containing about 12% protein the bran has about 18% (reckoned on the nitrogen content) and the germ about 40%, whereas the endosperm (white flour) has but 11%, so that weight for weight the bran is richer in nitrogen than either the wholemeal or the white flour (Osborne et al. 1919b). Much of this nitrogen, however, is enclosed in the woody portion of the bran and is not available to man because the digestive enzymes cannot get at it until the woody fibre is disintegrated by bacterial action, so that the quantitative advantage is largely lost by the greater fæcal excretion of nitrogen. The point to be emphasised is that the proteins of the germ, aleurone layer and bran are composed of a different mixture of amino-acids from that of the proteins of white flour (known as gluten), so that the addition of them to gluten may by their supplementary action raise the biological value of the mixture out of proportion to the amount added.

The white flour used for making ordinary white bread represents about 75% of the grain, and so-called patent white flours of the highest grade of 'purity' may represent only 30–40%. White flours consist almost entirely of the starchy endosperm, while the discarded portion or offals, which includes the germ and aleurone layer, contains more nutritious proteins and is much richer in the B vitamins. In the manufacture of National Wheatmeal the aim has been to obtain 85% of the wheat grain in the flour and to include the germ and some of the aleurone layer, so that the discarded 15% should consist as far as possible of bran only. The specification for National Wheatmeal contained in the Second Memorandum of the Medical Research Council (see *Lancet* 1941, i, 703) secures a flour of this description.

The experiments described below were designed to gain information regarding the nutritive value of the mixtures of proteins contained in wholemeal flour obtained from the wheat by 100% extraction, in National Wheatmeal of 85%, and in white flour of 73–75% extraction. (When used in this sense, 'extraction' is a technical term signifying merely the proportion of the original wheat which is present in the milled product.)

NUTRITIVE VALUE OF PROTEINS

The nutritive or "biological" value of proteins has usually been studied by one of the two following methods:

1. The *balance-sheet method*, in which estimation is made of the minimum (true) daily intake (A) of the protein needed to maintain the animal in nitrogenous equilibrium—that is, to repair the daily nitrogenous expenditure (B) involved in wear and tear of the tissues. The true intake, or nitrogen absorbed, is the difference between the amount ingested and the portion lost in the fæces which is derived from the food. For an adult animal the biological value of the protein can be expressed as the percentage of the nitrogen absorbed which is retained in the body for this purpose, that is by the ratio B/A × 100.

2. The *growth method* of Osborne and Mendel (Osborne et al. 1919a), in which the increase in weight of young animals is measured over a specified period of their growth and also their intake of the protein, the weight increase per unit of protein ingested being taken as an indication of biological value.

There are advantages and disadvantages in both methods. Method 1 is simple and direct in theory, but possesses many technical difficulties. It involves the determination of the daily endogenous nitrogen expenditure during a period in which the animal receives a protein-free diet. The calorie intake during this period must, however, be sufficient to prevent loss of weight, and this is often difficult and may prove impossible, for appetite fails when the diet contains no protein. Method 2 is an empirical one and the figure obtained is not a measure of the real biological value, but does give information of the special value of the protein for growth as well as maintenance. Since young, rapidly growing animals are more sensitive than adults to the quality and quantity of protein in their diet this method in many ways is the more useful for nutritional studies. In both methods certain assumptions are made in the calculations involved and the error in the final results may often be considerable. Method 2 was used in the long series of tests made by Osborne and Mendel and their colleagues on the value of different purified proteins, as well as of the mixtures present in various cereals and other natural foods. It was used in the present work.

There are many published determinations of the biological value of the mixture of proteins contained in whole wheat and its milling products, the tests being made with methods 1 and 2, variously modified. The results have almost invariably shown a higher nutritive value for the mixture of proteins in the whole grain than for those of the white flour (endosperm) milled from it. But the variation in the values obtained has often been great, and in no case, as far as I am aware, have different flours been compared which were derived from the same sample of wheat. A summary of these results is given by Boas-Fixsen (1935).

EXPERIMENTAL MATERIALS AND METHODS USED

The flours compared in each experiment were always obtained from the same grist and were provided by the Research Association of British Flour Millers. The samples of wheat were blends of Canadian, English and other wheats such as are generally employed in the production of flour for bread making. The samples of wholemeal and of 85% extraction flours were ground to a special degree of fineness so that the particles passed a mesh of 60 to the inch.

Growth was compared of groups of young litter-mate rats fed from shortly after weaning on diets of which all the protein was derived from the flour investigated. A small proportion of fat, as 4% hardened arachis oil, was included, and 2% of a salt mixture (McCollum's No. 185) to correct the mineral deficiencies of the cereal. Vitamins A and D were provided by 1% cod-liver oil in the diet, and the B vitamins by a daily dose, given separately to each rat, of 1 c.cm. (≡ 0·5 g. dried yeast) of a protein-free yeast extract.

Since in these diets the amount and kind of the proteins were the factors limiting growth, they were arranged to contain a suboptimal amount. For maintenance of optimum growth in young rats it is usual to give diets containing 15% or more of a "first-class" protein such as casein. In these experiments the diets made with flours of 100% and 85% extraction contained 10–13% of protein (calculated on dry weight) and those made with white flours (73–75% extraction) contained 12·5, 15 and 20%. The wheats used were of high protein content, containing 14–16% protein (nitrogen × 5·7), calculated on the dry weight. To obtain the diets with 10–13% protein content it was usually necessary to add a small amount of pure maize starch (nitrogen content about 0·03%); to obtain diets containing 15% or 20% white flour proteins extra gluten prepared from the flour was added.

The diets after mixing with water were cooked by heating in a steamer for about 1½ hours. The resulting cake was convenient to feed, but frequently the rats scattered it, and to prevent this it was mashed to a thick paste with water. The rats were kept in separate cages with open-mesh floors which permitted the passage of fæces and scraps of unconsumed food. These were separated after being collected on sheets of filter paper, supported on wire gauze trays over a tray of peat bedding on which the cage was placed. Each group of 5 to 8 rats receiving the same diet was treated as one unit; estimation was made of the food intake and of

Notes, Comments and Abstracts

AN ALL-ROUND CHANCE

MR JOHN AUDRIC, headmaster of Brockham Green School, Surrey, writes The last two decades have seen tremendous developments in the measures taken to safeguard the health of school-children Central clinics have carried out routine medical inspections of all children at definite periods in their school life, correcting defects where they exist or operating where necessary, sending some children to special centres for treatment, prescribing courses at speech clinics for those suffering from impediments, supplying cod-liver oil and milk, as well as treatment for eye trouble The school dental surgeon has worked side by side with the doctor Complete cooperation and coordination exists, and the teamwork has included the head of the school, who has been expected to be present during the examinations when remedial exercises in the physical-training lessons have been discussed The medical attention is by no means limited to the periodic examinations The central clinics are open daily, and many a headmaster has discovered his absentees in an adjacent clinic awaiting treatment for minor ills Sometimes the same lads keep turning up in different clinics, and the exasperated head may be pardoned if he wonders whether the boys are swinging the lead, and if more cooperation between the parent and the clinic would reduce the number of such visits

When the child leaves school there is—through no fault of the school medical service—a break in the continuity of medical supervision Welfare committees try and offset this but they fail to make up much ground, for the boy feels that his weekly wage makes him a man, who only visits the doctor when he has to, and the dentist as a matter of absolute necessity As a headmaster, I always feel that I am writing finis to a record of good work when I write the word "left" across a leaver's medical card and throw it into the salvage basket Surely this medical diary of ten years could be sent to the local doctor who could in turn pass it on to the youth's panel doctor?

But the facilities for the detection of the brains of the school population are pitiful by comparison with the facilities for preserving health Yet the present war has shown us the vital need for leaders The nation will benefit from a supply of clever men and women for competition for the responsible posts in the state, but time and money must be spent if they are to be forthcoming Children should be watched from this point of view in the elementary stages—not necessarily the elementary school—just as their health is watched Promising children should be noted, and their mental attainment recorded It may be argued that the clever son or daughter of parents of moderate means has the chance of a scholarship to the secondary school But this is not enough, for they will probably leave school with a matriculation certificate and drift into the commercial or technical world, using only half their brains and becoming just one more square peg in a round hole The clever child is an asset to the state and should be subsidised If public schools are the best recruiting agencies for public life and for the industrial, commercial and professional worlds, then it is to these schools that every clever child should go The smaller classes of these schools alone are a tremendous advantage, for they come nearer to private coaching than do the secondary, technical and commercial schools This will entail the award of more scholarships or state subsidies, but the state will get a full return in the development of its mental assets

In the elementary stages, children could be selected by the head teacher, afterwards a visiting panel of experts could take over, and such a panel should not be costly It is between the years 15½ and 17 when real guidance is needed Those with a flair for foreign languages should proceed on a government grant to a foreign university Incidentally, how many of our linguists have any knowledge of the asiatic or oriental tongues? The zeal with which Russian is being studied in the evening classes—and as head of a large evening institute I can speak from experience—suggests that there is and has been an unsatisfied demand for the acquisition of the more difficult foreign tongues, this is more than a passing fashion Again, how few of the promising boys and girls who study foreign languages for seven years at the secondary school ever carry on their study to any useful extent after leaving? Complete mastery of a language requires residence abroad, and bread and butter comes first

Similar encouragement and assistance should be given to those who wish to enter the Government service, the professions, and the technical and commercial world Brains, not money should be the open sesame to the hitherto locked doors of selected careers, and the paternal cheque-book would no longer be a substitute for mental attainment

GLANDULAR CHEILITIS

IN 1926 Puente and Acevedo described an affection of the lower lip characterised by hyperplasia of the accessory salivary glands which seems to occur with special frequency among Spaniards This has been termed glandular cheilitis, or Puente's disease D A Casals reports 7 new cases observed in Cuba (*Vida nueva*, 1941, 48, 268) The disease is essentially chronic, and begins in the middle third of the lower lip, gradually spreading outwards The line of contact with the upper lip is the area usually affected Red points appear on the mucous membrane which are found to be the enlarged orifices of the glands, on compression of the lip between the finger and thumb a clear fluid can be expressed from these orifices and at the same time a nodular sensation is imparted to the fingers The lip becomes swollen and projects forward Histologically the lesion is a hyperplasia of the glands with dilatation of the ducts, in the later stages it is associated with leukoplakia of the mucosa of the lip, and is regarded by Casals as a precancerous condition Glandular cheilitis seems to be a disease of adult life, in only one of Casals's cases did the history go back to childhood It has not been described in any member of the Nordic races, nor in coloured people

RECLAMATION OF AGAR

Macmorine (*Canad publ Hlth J* January, 1942, p 39) has devised a method for reclaiming agar from culture media Agar from Roux bottles is melted by autoclaving and poured into cylinders about 6 in in diameter Petri dishes are placed in boiling water and the agar melted off Blood or serum present is coagulated by the heat and filtered off through cheese cloth into the cylinders After it is set the agar is removed from the cylinder and cut into slices 0 5 cm thick, which are washed with cold tap water in large vessels till relatively free from broth It is then re-melted and carbon black added to decolorise it and remove other broth factors The mixture is filtered through a hot Buchner funnel lined with filter paper and hot paper pulp Potassium oxalate and potassium carbonate are added to the resultant solution and the mixture is autoclaved for 1½ hours at 250° F The hot agar is filtered and poured into two volumes of cold acetone with vigorous stirring Ethyl alcohol may be used but the precipitate is then more colloidal With acetone agar comes down as a fairly granular precipitate which is filtered, washed with acetone and dried on paper By this method three-quarters of the agar is recovered

Appointments

DIAMANT DESSER, MARGARET, M D VIENNA M O at Lincoln General Infirmary

GREER, C H, M B LOND R S O at County Hospital, Alverstoke, Gosport

LIGHT, L H B, M R C S examining factory surgeon for Burnham on Crouch, Essex

MACLEAN, ROBERT A, M B GLASG D P H asst M O for Leeds

MURRAY, DAVID, M B GLASG examining factory surgeon for Thornhill Dumfries

PHILIP, T V R, M B EDIN D P H medical superintendent at the Nieuport Sanatorium, Almeley, Herefordshire

RICHARDS, ROSEMARY, M B BIRM temp asst school M O for Stoke on-Trent

Wrexham and East Denbighshire War Memorial Hospital—The following appointments are announced

EDWARDS H L, L D S hon dental surgeon,

NOWELL STANLEY, M B MANC, F F R D M R hon radiologist

OWEN JONES, R, M B LOND, F R C S E hon gynæcologist, and

WYN JONES, L, M D LPOOL, M R C P, D P H hon cardiologist

AVERAGE VALUES PER RAT OVER THE FIVE-WEEK PERIOD

Expt	Diet	Protein (on unit of diet) (%)	No of rats	Dry food eaten (g)	Protein eaten (g)*	Body-wt (g)		BV† of protein	Fæces			Food N ingested (g)	Food N digested (apparent) (g)	Coeff of digestibility	BV† of digested protein
						Init	Incr		Dry wt (g)	N content (%)	Total N (g)				
1	Wholemeal	13.4	6	357.5	48.1	58.1	82.2	1.71	35.7	3.3	1.18	8.44	7.26	86	1.98
	White flour (73% ext)	13.1	7	272.9	35.2	56.1	51.3	1.46	6.63	7.3	0.48	6.18	5.69	92.2	1.58
3	Wholemeal	12.1	5	329	39.9	55.6	64	1.6	30.2	3.74	1.13	7	5.87	83.8	1.91
3a	White flour (73% ext) — gluten	15.4	6	310.3	47.8	55.3	58.6	1.22	11.3	7.11	0.8	8.4	7.59	90.4	1.35
3b		20.2	5	342.8	69.2	56	83.6	1.21	12.3	7.26	0.89	12.17	11.28	92.7	1.3
4	Wholemeal	12.5	5	316.9	39.9	45.8	70.8	1.77	33.9	3.47	1.18	7.01	5.83	83.2	2.13
	National Wheatmeal (85% ext.)	12.4	6	275.9	34.5	44.7	57.6	1.67	19	4.65	0.88	6·06	5.17	85.4	1.95
	White flour (75% ext)	12.6	5	245.9	30.9	45.6	45.8	1.48	9.54	6.9	0.66	5.43	4.77	87.9	1.68
5	Wholemeal	12.3	8	338.6	41.7	47.5	70	1.68	36.7	3.65	1.34	7.33	5.99	81.7	2.05
	National Wheatmeal (85% ext)	12.3	8	317	38.9	48.5	59.7	1.54	21.9	5.09	1.11	6.82	5.71	83.6	1.83
	White flour (73% ext)	12.4	8	281.5	34.9	48.6	46.6	1.33	11.4	7.05	0.8	6.13	5.32	86.8	1.54

* Calculated as N × 5.7

† BV (biological value) $= \frac{\text{weight increase (g)}}{\text{protein eaten (g)}}$

results of experiments made with rats on the digestibility of proteins.

BIOLOGICAL VALUE OF THE PROTEIN ABSORBED

If in Osborne and Mendel's expression for biological value the amount of protein made available to the body is substituted for the amount of protein ingested, the differences in biochemical value between the mixtures of proteins in flours of different degrees of extraction are greater (*cf columns 9 and 16 in the table*). A superiority of 26–33% is shown by the proteins of wholemeal and of 16–18% by those of National Wheatmeal over those of white flour.

In the assumption that the nitrogen of the fæces is wholly derived from the ingested food no allowance is made for the contribution made by the nitrogen of the digestive juices and other secretions in the intestinal tract. The amount of this endogenous fæcal nitrogen has been calculated from the results of experiments in which protein-free diets have been fed. Mitchell (1924) found it to be related to the quantity of food eaten and to amount to from 1.5 to 2 mg. per gramme of (dry) food. For rats of body-weight 50–150 g.—the size of those used here—the application of such a correction to the figures in the table would raise the coefficients of (apparent) digestibility and lower slightly the values for the biological values of digested protein. It is perhaps sufficient to say that the values representing the true nutritive value of the proteins of the various flours lie between the figures given in the table for the protein ingested and for the protein digested. As a guide to the value of the protein in a diet as eaten, however, the former figures are those of practical importance.

* * *

A 20% improvement in the biological value of the proteins of the bread eaten may not be a matter of moment in a mixed diet in which the rest of the protein is provided by meat, milk, cheese and eggs. It would, however, assume importance if the proportion of bread in the diet were increased to an extent in which it had to furnish the bulk of the protein as it does the bulk of the energy. It is for the provision of B vitamins that the consumption of wholemeal flour, and of flours of the higher degrees of extraction of the grain is much more important. For this purpose their superiority compared with white flour is so great that all ordinary diets would be affected although naturally to a greater extent when bread forms a large proportion of the daily food. The vitamin B_1 (thiamine) content of wholemeal flour is about 4, the vitamin B_6 (pyridoxin) about 1.5–2, the riboflavin about 2–3, and the nicotinic acid about 5 times that of white flour (see Second Memo of MRC 1941, personal communications from Miss A. M. Copping 1942, Hodson and Norris 1939, Bacharach 1941). National Wheatmeal, milled according to the recommended specification, in the quality of its protein as well as in its content of B vitamins, is intermediate between *wholemeal and white flour but nearer to wholemeal*. The provision of National Wheatmeal bread by the authorities is a wise compromise affording to a great extent the advantages of wholemeal bread in a form more acceptable to the general public.

SUMMARY

A study has been made of the weight increase of young rats when maintained on diets of which the protein was derived solely from wheaten flours of different degrees of extraction of the grain. The flours compared—wholemeal (100% extraction), National Wheatmeal (85% extraction) and white flour (73–75% extraction)—were always obtained from the same sample of wheat. The diets contained adequate provision of all other known essentials so that the supply of protein was the factor limiting growth.

The growth rates on diets containing 10.5% and 12.1% of wholemeal proteins were found to be slightly better than those on diets containing 13.1% and 15.4% of white-flour proteins, indicating that 10.5 g. of the mixture of proteins in the whole wheat was as useful to the rat as 13.1 g. of white-flour protein.

The biological values of the proteins in these different flours, as indicated by the expression of Osborne and Mendel—weight increase in grammes corresponding to 1 g. of protein ingested, determined over a five-week period—ranged from 1.6 to 1.77 for wholemeal, from 1.54 to 1.67 for National Wheatmeal and from 1.21 to 1.48 for white flour. The result of different experiments showed an advantage over the protein in white flour of 17–26% for the proteins of wholemeal and of 13–16% for those of National Wheatmeal.

The coefficients of digestibility of the proteins in the three types of flour were determined from calculations based on comparison of the protein intake with the amount of nitrogen lost in the fæces. The figures obtained for wholemeal and National Wheatmeal were lower than that for white flour by about 6% and 3% respectively. These losses, however, are more than compensated for by the greater nutritive value of the proteins in these flours.

I wish to acknowledge the help of Sir Charles Martin, not only in the hospitality given to the Division of Nutrition at Roebuck House, Cambridge, but also in the advice and criticism offered throughout the investigation. I am indebted to the Research Association of British Flour Millers for the samples of wheat and flours used; to Roche Products Ltd. for a gift of pure riboflavin; to Messrs. Mackean Ltd. for a supply of pure maize starch and to Messrs. Greene, King and Co. for the yeast from which the yeast extract was made. My thanks are due to Mrs. C. E. Work, Ph.D., and Mrs. Margery Cutting, Ph.D., for assistance in experiments 1 and 5, to Mr. G. W. Flynn for help in the care of the experimental animals and to Mr. G. A. Childs for analyses of materials.

References at foot of next page

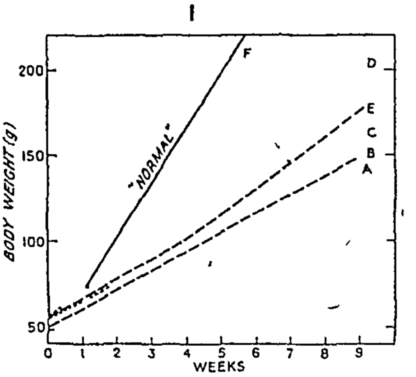
its nitrogen content for the whole group and also of the dry weight and nitrogen content of the pooled fæces

One important nutritive advantage of wholemeal over white flour is its higher content of B vitamins The dose of yeast extract given would, however, afford an adequate supply for young rats apart from any present in the flours Nevertheless, since the rats receiving the wholemeal diet did undoubtedly receive a greater amount of B vitamins, to ensure that all groups obtained an optimal supply, additional daily doses were given to each rat in the later weeks of experiments, in the form of 5 μg pure vitamin B_1 and 12 μg pure riboflavin, these being the two B vitamins in which white flour is most deficient, as compared with wholemeal

EXPERIMENTAL FINDINGS

Expt 1 —Comparison was made between the proteins of wholemeal of 100% extraction and of white flour of 73% extraction, these proteins being present in each case to the extent of 13% of the diet Details of this and following experiments are shown in the table The average consumption of diet, and therefore of protein, over the period of the experiment by rats receiving the wholemeal diet was greater than that of the rats receiving the white-flour diet, but the weight increase per unit protein ingested showed an even greater difference The biological values of the proteins in this and the other experiments were calculated from the results obtained during the first 5 weeks this being the period of most rapid growth The increases in body-weight in grammes per gramme of protein ingested were 1 71 and 1 46 respectively for the proteins of the wholemeal and white flour, showing about a 17% advantage for the proteins of wholemeal flour

1



2

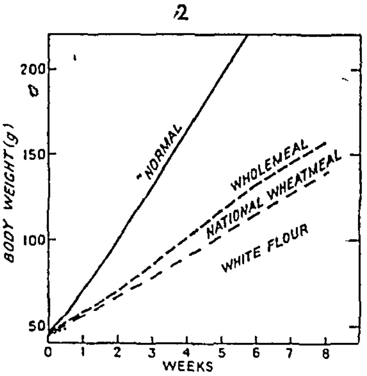


FIG 1—Average growth curves of 5–6 young rats

(A) on white flour diet containing 13 1% protein } Expt 2
(B) on wholemeal diet containing 10 5% protein }
(C) on white flour + gluten diet containing 15 4% protein }
(D) on white flour + gluten diet containing 20 2% protein } Expt 3
(E) on wholemeal diet containing 12 1% protein }
(F) on complete synthetic diet containing 18% protein as casein (male animals)

FIG 2—Average growth curves of 5–6 young rats in expt 4

On white flour diet (75% extraction) containing 12 6% protein
On National Wheatmeal diet (85% extraction) containing 12 4% protein
On wholemeal diet (100% extraction) containing 12 5% protein
On complete synthetic diet containing 18% protein as casein (male animals)

This result is in substantial agreement with that of Osborne and others (1919b), who, also working with young rats, obtained figures of 1 31 and 1 09 for the biological values of the proteins of whole wheat and of white flour plus gluten, in their experiments both diets contained 10 3% protein

When the lower digestibility of the nitrogen of the wholemeal flour, described below, is taken into account, the superiority of the nutritive value of its protein is seen to be even greater

Expts 2 *and* 3, designed to be the converse of experiment 1, confirmed its result In experiment 2, the proportion of protein (10 5%) in the wholemeal diet was reduced to about three-quarters of that in the white-flour diet with which it was compared (13 1%) The rate of growth of rats receiving the latter was still somewhat lower than that of the animals receiving the wholemeal diet (see curves A and B, fig 1) In experiment 3, the growth rate on a wholemeal diet containing 12 1% protein was found to be superior to that achieved on a white-flour diet containing 15 4% protein (experiment 3a), though inferior to that achieved when the protein was increased to 20 1% (experiment 3b, see curves C, D, E, fig 1) The detailed results of experiment 3 given in the table show that the biological value of the wholemeal proteins (g weight increase per g protein ingested) was 1 6 and that of white-flour proteins 1 2

Expts 4 *and* 5 included tests of the proteins of National Wheatmeal flours of 85% extraction These flours were kindly prepared in the laboratories of the Research Association of British Flour Millers according to the specification for flour II in the Second Memo of the MRC The materials for the two experiments were derived from two different samples of wheat, and in both comparison was made between the proteins of the 85% flour, of the wholemeal (100% extraction) and of the white flour (73–75% extraction) All the diets contained a similar proportion of protein—namely, 12 3–12 6% The rate of growth of the rats receiving the National Wheatmeal diet was in each case intermediate between that of animals receiving the wholemeal and white flour diets (see fig 2) The biological value of its mixed proteins was also intermediate, and in experiments 4 and 5 showed a superiority of 13% and 16% respectively over that of the white-flour proteins The superiority of the wholemeal proteins was 20% and 26% in the two tests

The difference in nutritive value between the proteins of the whole wheat and those of the white flour milled from it is also demonstrated, perhaps better, in the average growth curves of the rats reared on them The young animals always did better on the proteins of the whole wheat—they ate more food and they also made better use of it A numerical comparison of the value of the proteins can be obtained by comparing the different proportions needed in the diet to produce equal rates of growth Thus comparison of curves A and B in fig 1 shows that 10 5% of wholemeal proteins in the diet is slightly superior to 13 1% of white-flour protein, and comparison of curves C, D and E shows that 12% of wholemeal proteins is equivalent to a proportion of white-flour protein between 15% and 20% The relation between these figures for the two types of proteins is in agreement with those obtained by calculation of the biological value by the method of Osborne and Mendel

DIGESTIBILITY OF PROTEINS IN DIFFERENT FLOURS

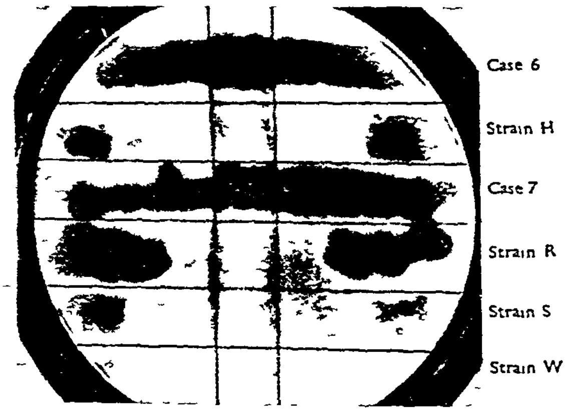
The dry weight and the nitrogen content of the fæces passed were in all cases greater on the wholemeal than on the white-flour diets, while the figures for diets containing the 85% flour were intermediate Coefficients of digestibility for the proteins (nitrogen × 5 7) in the different flours have been calculated on the assumption, only partly true (see below), that the fæcal nitrogen represents only the undigested nitrogen of the diet For the two different samples of wheat used in experiments 4 and 5 values were obtained of 87 9 and 8 68 for the white-flour proteins, of 85 4 and 83 6 for those of National Wheatmeal, and of 83 2 and 81 7 for those of wholemeal From these figures the average digestibility of the proteins of National Wheatmeal and of wholemeal is seen to be 3% and 6% lower, respectively, than the average digestibility of the corresponding white-flour proteins The loss, however, is more than compensated by the greater biological value of the former

The wholemeal and white flours used in experiment 1 were the same as were used in an experiment made on human subjects by Macrae and his colleagues (1941) to test the digestibility of the breads baked from these flours In their tests the average coefficients of digestibility for the nitrogen of the white and wholemeal breads were 91 and 85 3 These figures show a satisfactory agreement with those obtained in the present trials of the same flours with rats—92 2 and 86—and the agreement suggests that it is permissible to apply to man the

9, being isolated On June 7 *Strep pyogenes* A 12 was isolated from the healthy looking wound Pinch grafts on June 13 and July 16 were a total loss The leg afterwards healed without further grafts.

12—Man, aged 54 Upset a saucepan of boiling water during epileptic fit on May 14, 1941, sustaining scalds of both thighs and of genitalia Admitted June 26 when *Ps pyocyanea* was isolated, but no streptococci On July 26 *Strep pyogenes* A 12 was isolated, but no clinical change was noticed On Aug 4 a severe cellulitis began, spreading down the left leg and up into the left buttock, requiring multiple incisions The patient became very ill and nearly lost his life

13—Man, aged 28 Blown into a fire by bomb blast on Nov 17, 1940, sustaining burns of the left side of head, face, shoulder and left upper arm On admission next day group C streptococci were isolated from exudate at the edges of the tanned areas, and from a throat swab They disappeared after a course of sulphanilamide by mouth, but have occasionally been isolated since, probably as a result of reinfection from the throat Several successful grafts were carried out On Aug 20 a pedicle based on the front of the left shoulder and upper part of the chest was attached to the left cheek It became detached and was re attached the same evening in the ward Next day the patient had a temperature of 101 8° F and *Strep pyogenes* A 12 was isolated Sulphanilamide was given by mouth, and various local applications employed The streptococci persisted for a month, but none of the graft was lost



Blood agar plate with vertical central strip containing 1 in 5000 sulphadiazine showing four sensitive strains of *Strep pyogenes* (H, P, S and W) and two resistant strains from cases 6 and 7

TESTS FOR SULPHONAMIDE SENSITIVITY

Of several methods examined, a modification of that described by Fleming (1940–41) has been found most convenient for the in vitro demonstration of the sensitivity of streptococci to the sulphonamides Those which were not inhibited by sulphanilamide in vitro were not inhibited by other sulphonamides—of which sulphapyridine sulphathiazole, sodium sulphacetamide (‘ Albucid Soluble ’), sulphadiazine and sulphaguanidine were tested—and did not respond to local or oral sulphonamide therapy

A central strip about ¼ in wide is excised from a 5% horse-blood agar plate, and the ditch is filled with blood agar containing 1 in 5000 of the sulphonamide (To 100 ml of melted agar 20 mg of the sulphonamide is added, and this is kept in a boiling-water bath for 20–30 minutes, it is then tubed in 5 ml lots, and when required one tube is melted, cooled to 48° C, and 0 25 ml of blood is added) The plate is refrigerated for at least 4 hours, *or overnight. One loopful* of a 1 in 2000 dilution of an overnight culture of the streptococcus in 5% serum broth is streaked across the plate, and spread as evenly as possible Up to six strains can be tested on one 4 in Petri dish Some of the difficulties have been previously reported (Colebrook and Francis 1941b)

The accompanying photograph of one such test shows strains from cases 6 and 7, together with four sensitive strains of *Strep pyogenes*

DISCUSSION

In cases 3, 4 and 7 the presence of the sulphonamide-resistant streptococcus did not cause any general reaction or change in the appearance of the wounds but in each case surgical intervention was followed by a severe infection In cases 5 6, 9, 10 and 12 severe infections occurred without surgical interference

It is not suggested that *Strep pyogenes* type 12 is resistant to the sulphonamides, in fact several sensitive strains of this type have been encountered There is no evidence to connect them with this series of cases A resistant strain of group A, type B 3264, has been isolated from 2 cases, but numerous sensitive strains of this type were encountered Resistant strains of type 13 have also been isolated (E T C Spooner 1941 personal communication) The phenomenon seems to be similar to the different sensitivity of various strains of pneumococci of a given type (Maclean, Rogers and Fleming 1939)

The spread of this infection was recognised owing to the practice of making repeated examinations of the wound flora, and of typing streptococci if a new infection was suspected Many of these cases had been admitted with infections by streptococci of other types and groups, and these incidents might well have been interpreted as recurrences of earlier infections, or as failures of local sulphanilamide therapy The mode of spread has not been satisfactorily explained A “ no-touch ” technique was not employed for dressings at that time, reliance being placed on gloved hands Sterile gloves were put on at the beginning of a dressing round, and were washed with soap and water for two minutes between each dressing Some workers have emphasised the possibility of aerial dissemination of infection from blankets and dressings The blankets were not treated with oil, as now recommended (van den Ende and Thomas 1941) It is possible that the bath in which case 1 was treated served as the vehicle in two or three cases, but the evidence is not conclusive The bath was disinfected after use by a method similar to that described in the Medical Research Council War Memorandum No 6, but this bath had a mixer input, covered by a riveted brass disc, which was below the surface of the water when the bath was filled, and this could not be adequately sterilised

The control and treatment of infections due to sulphonamide-resistant streptococci will probably depend on substances like gramicidin and penicillin In case 3, an infection by resistant streptococci which had produced serious trouble after a grafting operation was successfully eradicated by local applications of gramicidin Experiments in vitro have shown that these sulphonamide-resistant streptococci are just as easily inhibited by gramicidin as are sensitive strains Colebrook (1941, personal communication) has shown the same to be true of penicillin.

SUMMARY

A series of 13 cases of infection by a sulphonamide-resistant strain of *Strep pyogenes* type 12 is recorded, and the origin has been traced to the introduction of a single case infected with that organism

In one case the resistant organism was eradicated by local applications of gramicidin

I am indebted to Sir Harold Gillies for access to cases under his care, to Miss M B Rutherford, sister in charge of the ward, for her coöperation in the investigations, to Colonel Leonard Colebrook for criticisms and advice, to Dr C W Morley for laboratory hospitality, to Mr T W Pearce for taking the photograph, and to Dr Dora Colebrook, Dr S D Elliott and the late Dr F Griffith, who typed the streptococci

REFERENCES

Colebrook L and Francis, A. E (1941a) *Lancet*, i 271, (1941b) *J Path Bact* 53 155

Dubos, R. J and Cattaneo, C (1939) *J exp Med* 70, 249

Fleming, A (1940–41) *Proc R Soc Med* 34, 342

Maclean I H, Rogers, K B and Fleming A. (1939) *Lancet* i 562

van den Ende, M. and Thomas J C (1941) *Lancet*, ii, 755

ST JOHN’S COLLEGE, CAMBRIDGE —On Wednesday, May 6, at 5 P M, Sir John Barcroft F R S, will deliver the Linacre lecture in the lecture-room of physiology. He will speak on the onset of respiration at birth

SULPHONAMIDE - RESISTANT STREPTOCOCCI IN A PLASTIC-SURGERY WARD

A E FRANCIS, M D LOND , M R C P
MAJOR R A M C , ASSISTANT BACTERIOLOGIST TO ST BARTHOLOMEW'S HOSPITAL

IN an earlier communication (Colebrook and Francis 1941a) the conclusion was reached that the reduction of streptococcal infection of wounds in a plastic-surgery unit from 73% to 20% (or 12% of group A infections) in six weeks was mainly the result of the local application of sulphanilamide powder , though it was difficult to discount the effect of other procedures introduced at the same time, such as an improved dressing technique, the application of spindle oil to ward floors, formalin disinfection of wards vacated by infected patients, segregation of cases, and the prophylactic oral administration of sulphanilamide to cases undergoing operations The cases reported in this paper, however, support the conclusion, and demonstrate that cross-inoculation of wound infections was still occurring, despite the precautions taken In a period of four months, 10 cases of cross-infection by a sulphonamide-resistant strain of *Streptococcus pyogenes*, group A, type 12 (A 12) were detected, and at least 2 more occurred later In the same period only 1 case of cross-infection by sulphonamide-sensitive group A streptococci was demonstrated, though many cases with such infections were admitted during the period

All the cases occurred in one male ward, and all but 2 in that half of the ward to which case 1 was admitted He was treated in a bathroom at the end of a passage, from which opened successively the bathroom, a staircase, linen-room, two four-bedded rooms, an eight-bedded room, and four single-bedded rooms The two four-bedded rooms had a communicating door, but there was no direct communication between the other rooms

CASE-HISTORIES

1—Man, aged 22 Sustained petrol burns on Dec 13, 1940, when his aeroplane caught fire in the air Admitted on Jan 5, 1941, from another hospital, with heavily infected extensive burns of the face, both arms and both legs It was known that these were infected with hæmolytic streptococci, and he had received a total of 58 g of sulphapyridine by mouth but this had not controlled the infection *Strep pyogenes* A 12 and *Proteus vulgaris* were isolated from all the raw areas on admission Local applications of sulphanilamide powder had no effect on the clinical or the bacteriological picture, and the infection persisted until his death 10 weeks later

2—Man, aged 34 Cordite burns on May 14, 1940 Admitted on Sept 9 and had successful grafts to his hands on Sept 12 and Nov 9, 1940, and Jan 16, 1941 No open wound was left when the web of the right thumb was grafted on Feb 15 This graft was followed by a sharp febrile reaction, local suppuration and loss of half the graft *Strep pyogenes* A 12 was isolated in pure culture The wound took 4 weeks to heal Further successful grafts have been performed since The operation was done by the surgeon in charge of case 1, who assisted with the daily bathing and dressing of that patient

3—Man, aged 23 Received burns of face and hands during air raid on April 16, 1940 These were tanned Admitted on Aug 8 , a graft to the right lower eyelid, applied on Aug 16, was lost later from streptococcal infection Grafts to the hands on Sept 10 and on Dec 2 and 20 were successful On Jan 17, 1941, a tube pedicle was prepared on the left upper arm On Feb 8 *Strep pyogenes* A 12 was isolated from the raw area under the pedicle, which looked healthy and had been powdered daily with sulphanilamide On Feb 20 this pedicle was attached to the nose and oral prophylactic sulphanilamide given Next day he had fever, and profuse discharge from the nasal end of the pedicle flap which became gangrenous and had to be detached In this case both wounds were freed of these streptococci by the application of gramicidin kindly provided by Dr R J Dubos (Dubos and Cattaneo 1939), and subsequent grafts were successful

4—Man, aged 21 Legs run over by a bus on April 6, 1940, resulting in extensive skin loss from the left leg Admitted Sept 16, when the raw areas were found to be infected by a sulphonamide sensitive streptococcus, type 14 This rapidly disappeared with local sulphanilamide On March 3, 1941, *Strep pyogenes* A 12 was isolated for the first time and a graft applied on March 14 was a total loss The streptococci resisted local treatment with gramicidin and later sulphadiazine, and a septic arthritis of the left knee developed, the same streptococcus being grown from the joint fluid Subsequently the condition of the leg improved greatly, and epithelialisation was rapid, but the streptococci were still present in residual raw areas

5—Man, aged 67 Face and both hands burned by an explosive incendiary bomb on March 11, 1941 Treated with gentian violet tan Admitted March 17, and progress was uneventful, all areas being healed by March 29 except three small fissures on the left hand The hand then became swollen, his temperature rose to 101° F , two almost healed areas broke down, and *Strep pyogenes* A 12 was isolated from the purulent discharge Healing was completed in 12 days with conservative treatment only

6—Man, aged 58 Burns by furnace contents and crude oil during air raid on March 26, 1941, involving face, head, hands and forearms Triple dye tan was applied On admission on April 5 no hæmolytic streptococci were obtained from swabs, but on April 10 his temperature rose to 100 8° F and the right forearm became swollen and painful On April 11 *Strep pyogenes* A 12 and *Proteus vulgaris* were isolated All raw areas were gradually covered by pinch grafting, but the infection was never brought under control

7—Man, aged 36 In 1933 a myeloma of the head of the left tibia was excised, and radium applied A discharging cavity has been present in the front of the leg ever since, with a radium burn of the back and outer side which frequently breaks down Admitted Jan 21, 1941, when *Proteus vulgaris* and *Pseudomonas pyocyanea* were isolated On April 15 *Strep pyogenes* A 12 was found for the first time, but was not accompanied by any clinical change On May 7 the outer side of the leg was grafted, but his temperature rose to 101° F two days later, and on May 10 the whole graft was found to be gangrenous This wound was gradually covered by pinch grafts, but the streptococci persisted until healing was complete They were still present in the tibial cavity six months later, though various local measures had been employed and sulphanilamide given by mouth

8—A nurse scalded her left forearm on the ward steriliser on April 22, 1941 She did not report until next day, when a swab was taken and *Strep pyogenes* A 12 was isolated What was quite a trivial lesion took 4 weeks to heal

9—Man, aged 35 Oil burns, following explosion in a ship on Nov 29, 1940 Admitted March 18, 1941, with unhealed areas on head and both hands which were infected by a sulphonamide sensitive *Strep pyogenes* This rapidly disappeared with local sulphanilamide powdering On April 5 the head and the right hand were successfully grafted and the dressings left off the head, which, apart from a few scabs, appeared to be healed by April 22 Next day he developed a temperature of 101 2° F , with redness and swelling of the left side of face and head Pus oozed through holes in the graft, and *Strep pyogenes* A 12 was isolated The graft suppurated and broke down repeatedly for 3 months

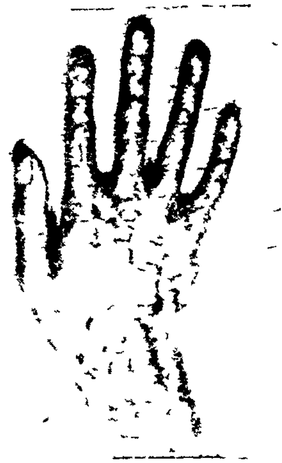
10—A nurse received a small burn on the back of the left hand from a cigarette while bed making When reported next day, May 5, 1941, it was obviously infected, and *Strep pyogenes* A 12 was isolated Local sulphanilamide was applied, but cellulitis of the forearm developed and was not controlled by sulphanilamide given by mouth She was off duty for a month

11—Boy of 15 Sustained burns of the outer side of left knee and leg on April 13, 1941, while examining a car petrol tank with a lighted match Admitted May 8 when a sulphonamide sensitive *Strep pyogenes* was isolated A Thiersch graft was applied on May 19 after powdering with sulphanilamide daily before operation Oral prophylactic sulphanilamide had not been given The graft suppurated and half was lost, the same sulphonamide sensitive streptococcus, type

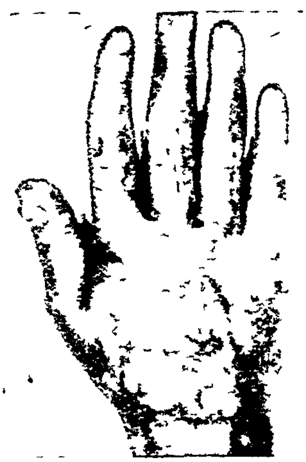
---

DR HARRIETTE CHICK REFERENCES

Bacharach, A L (1941) *Nutr Abstr Rev* 10, 459
Boas Fixsen M A (1935) *Ibid*, 4, 447
Girard, A (1897) *C.R Acad Sci* 124, 876, 926
Hodson, A Z and Norris, L C (1939) *J biol Chem* 131, 621
Macrae, T F , Bacon, J S D Hutchinson, J C F and McDougall, I (1941) *Chem & Ind* 60, 723
Mitchell, H H (1924) *J biol Chem* 58, 873
Osborne, T B and Mendel, L B (1916) *Ibid*, 26, 1
— — and Ferry, E L (1919a) *Ibid*, 37, 223
— — — and Wakeman, A J (1919b) *Ibid*, 37, 557



6—Keloid scars on hands after third-degree burn not grafted



11—Healed burn of hand beginning to develop keloids

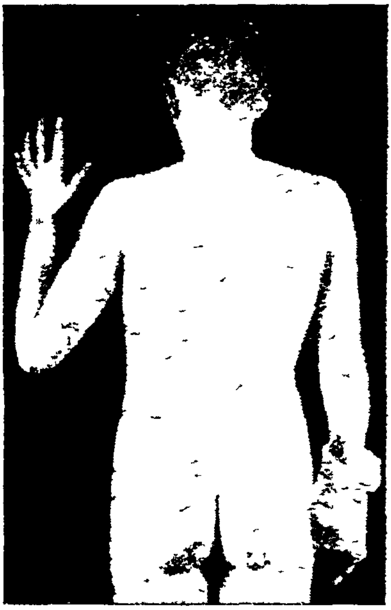
are in reality research stations, and the observations of the surgical teams as to best methods of treatment should go a long way to clarifying a very controversial subject

AFTER-TREATMENT

A follow-up is just as important in burns as in fractures if anything is to be learnt about the best forms of treatment and their end-results The great majority of burns are treated in various hospitals up and down the country —only the severe burns reach the burn centres—and it is important that we should have some idea of the final results of the less severe forms of burns (figs 8 9 and 10) In the Royal Navy there is a follow-up of all burn cases, so that the end-results of the trivial burns can be compared with those of the severe types There is still a tendency in the profession to take little interest in a burn when once healing has occurred This is a great pity, for the follow-up of service cases has proved the great value of the continued use of lanolin

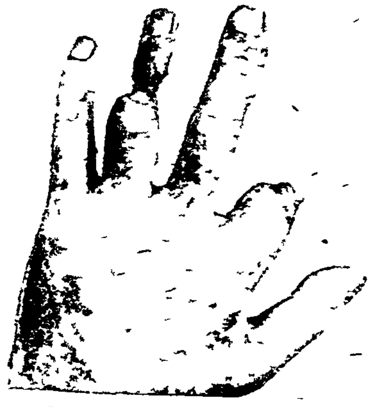
Use of lanolin —Wool fat in the form of lanolin (wool fat 7 parts, water 3 parts) is remarkably beneficial in the after-treatment of burns Every burn, no matter how trivial, should be treated with lanolin (*BP*) after healing has taken place I stress the *BP* because I am convinced that it is superior to the scented proprietary forms that are put up in nice-looking tubes and sold at fancy prices As soon as the burn area has soundly healed it should be massaged each night with lanolin The massage promotes good circulation and thus the skin area will eventually have a better blood-supply Lymphatic drainage is also improved if the hands are so treated To prevent soiling of the bed linen the burn can be covered at night by cotton gloves, thin stockings or bandages

Lanolin should be used for up to three months on extensive burns, the reason for this lengthy period being that there is always a tendency for newly formed skin to contract Our follow up in the Royal Navy has proved this over and over again What appears to be a soundly healed burn suddenly develops a keloid without any reason (fig 11) Burns with partial skin loss (1st and 2nd degree), which have healed without any sign of sepsis, may develop keloid formations a month or so later and massage with lanolin does prevent this complication in a number of cases This after-treatment, which is almost uniformly neglected or trivially used, is nothing more than surgical common sense All surgeons will agree that atrophied muscles which result after a fracture has been treated in a closed plaster require massage and exercise in order that full function may be achieved In the same way damaged skin requires suitable massage over an adequate period if a good functional result is to be obtained In cases of total skin loss, where skin-grafting has been used, the same after-treatment with lanolin should be given

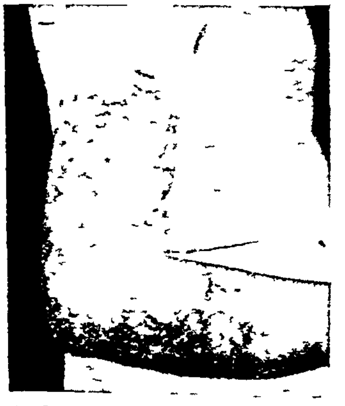


8—Extensive first and second degree burns of back arms and buttocks, permanent pigmentation

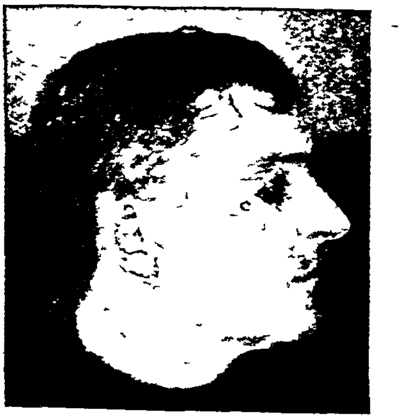
It is also necessary to warn patients not to allow a burnt area to be exposed to the rays of the sun for a lengthy period, or a further burn may ensue and healing be protracted To the layman the sun's rays are a cure-all for every malady and this belief is firmly imprinted on the mind of the sailor It is important, therefore, that the dangers of exposure to continued sunshine should be stressed in the late after-treatment of burns Several cases have been observed in which patients who have spent a hot afternoon sun-bathing after a swim in the sea have sustained extensive painful burns in areas which were burnt as long as four months previously Patients should be instructed that if they wish to bathe the area originally involved by the burn should be well rubbed with lanolin beforehand This does give protection but not against prolonged sun-bathing, which must be prohibited The same advice holds good for patients on whom skin-grafting has been performed for a sun burn may readily occur in the grafted area I have seen three



7—Electric burns of fingers dry gangrene resulted



9—Second degree burn of right arm keloid formation three months after burn had healed

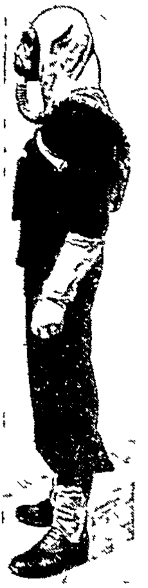


10—Keloid in front of right ear and atrophy of skin over auricle three months after mixed burn of face

THE LATE END-RESULTS OF WAR BURNS*

CECIL P G WAKELEY, C B , D SC LOND , F R C S
SURGEON REAR ADMIRAL, R N , SENIOR SURGEON TO KING'S COLLEGE HOSPITAL , CONSULTING SURGEON TO THE ROYAL NAVY AND THE MAUDSLEY HOSPITAL

IN this war burns have been common both in the Services and among civilians By far the greater proportion of war burns, given proper treatment, heal up well and give rise to no permanent deformities or disabilities, but in about 10% there is definite disfigurement or scarring During the war of 1914–18, out of over 3000 cases of major burns, treated in the various Naval hospitals and hospital ships, slightly over 20% were left with persistent deformities of the hands or face, in spite of plastic and other operative procedures This high incidence was due to sepsis, for a large number of the burns were either septic by the time they arrived at hospital or subsequently became so Sepsis was and still is the bugbear of the treatment of war burns, and the majority of scarring deformities are due to this alone



1 — Antiflash gear with gas mask

PROTECTIVE MEASURES

In the last war the common cause of war burns was cordite, and the face and hands were the sites most frequently affected So obvious was this that the Admiralty adopted protective measures for all gun crews These measures consisted of light asbestos gauntlets and over the head and shoulders a hood in which an opening for the face was cut, thus allowing the use of a service respirator (fig 1) This anti-flash gear, as it was called, was found to be of preventive value and was in use at the outbreak of the present campaign It soon became clear that more protection was required for the face, for our ships were subjected to repeated dive-bombing and a common type of facial burn resulted (fig 2) Facial protection was, therefore, an urgent necessity when a respirator was not being worn This extra protection was given in the form of an eye shield of cellulose acetate and a small mask of 'Aertex' material impregnated with a heat-resisting solution (fig 3)

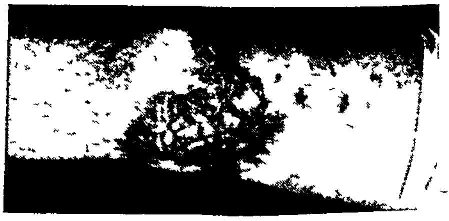
Since the introduction of this additional protection the number of burns of the face and hands has fallen considerably although the incidence of bombing has greatly increased This extra protective covering is, however, very trying in the tropics and is not always worn, and so burns still occur in men who have neglected this form of protection

EARLY AND LATE ASSESSMENT OF WAR BURNS

To arrive at a definite final assessment of war burns we should have exact knowledge of the extent and depth of the primary injury, but this is very difficult to obtain for many reasons In the first place, although the extent of the burns may be evident in the different healing stages yet the depth is often incorrectly assessed For example, many extensive burns which have healed satisfactorily have been reported as third degree or as involving total skin loss whereas in fact the burn was less deep and only involved partial skin loss If there is total skin loss the healing process is one of granulation-tissue formation, with subsequent epithelialisation from the periphery of the burnt area Such ingrowths of skin, if they are extensive, result in very thin attenuated epithelium which is liable to fissure and crack with the formation of keloid scars (figs 4, 5 and 6) All these complications can be prevented by early skin grafting, but although this is well recognised today it is not undertaken as often as it should be

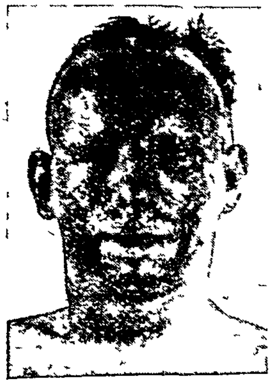
With war burns the medical officer who attends the initial burn rarely sees the case through the healing stages, and some burns before they are finally healed may have been through the hands of many medical officers This state of affairs has been especially noticeable in the present war owing to the constant evacuations that were necessary during the intensive bombing to which some of our ports and cities were subjected

It is admittedly difficult to assess the depth of a burn immediately after its receipt Many primary burns in the present war are treated either by the patients themselves or by fellow members of the crew in armed trawlers, tanks or aircraft and in such cases no assessment can be made It has been suggested that the presence of fat in the burnt area is indicative of total skin loss but I have not found this observation of any real value Most war burns are of mixed extent, there being regions of total and partial skin loss in the same area The electrical burn is the one exception, for it always causes total skin loss and should therefore be excised and skin grafted as soon after the injury as possible (fig 7)

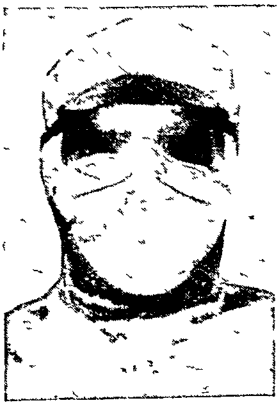


5—Keloid scars appearing in second degree burn around knee joint

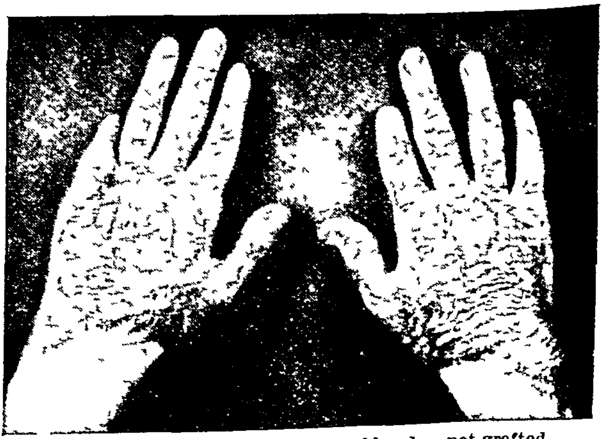
Burn centres—The only way to prevent constant evacuation of burn cases is the establishment of burn centres with special wards and equipment, such as saline baths and superficial X-ray therapy It is encouraging to see that the Ministry of Health, the Navy and the Air Force have recognised this necessity and have instituted special hospitals to which all serious burn cases are transferred as soon as possible These burn centres



2—Typical mixed burn of face



3—Latest antiflash gear as used by the Royal Navy



4—Extensive third degree burns of hands, not grafted

---

* Paper read before the Medical Society of London on March 23, 1942

TABLE I—NUTRITION OF *Strep hæmolyticus*

	Main constituents of deficient basal media *	Complementary nutrients	Growth
1	Bactopeptone	None Meat extract Concentrate of meat extract (2% of its weight) glutamine	0 + + +
2	Casein hydrolysate + glutamine	None Liver extract Concentrate of liver extract (0 3% of its weight) Pantothenic acid	0 + + +
3	Hydrolysed egg albumin + glutamine + pantothenate	None Yeast extracts Yeast concentrates (1% of weight) Vitamin B_6	0 + + +
4	Amino acids + glutamine + pantothenate + vitamin B_6	None Yeast extracts	0 +

* All media contained glucose nicotinamide, aneurine, riboflavin, and other essentials (McIlwain 1940a)

with mercuric salts which are considered (Fildes 1940a) to act by combining with thiol groups essential to the cell The action of mercuric salts could be prevented by further addition of thiol compounds Complete nutritional analysis of such an inhibition is more complicated than in the case of sulphanilamide Thus, acriflavine appears to act by combination with nucleotides which are essential to enzymes of the inhibited organisms (McIlwain 1942) but the inhibition can be reversed by supplying not only nucleotides but also amino acids, which appear to be the normal products of the enzymes which are being inhibited Higher concentrations of acriflavine appear to affect hydrogen transporting systems and inhibitions due to such concentrations can be reversed by artificial carriers (e g methylene-blue)

There is also evidence that the following inhibitors act as described certain dyes, by keeping oxidised substances which must be reduced to function normally (Fildes 1940b), pyridine-3-sulphonic acid and amide by competitive and non-competitive inhibition of enzymes concerned with nicotinic acid derivatives (McIlwain 1940b), α-aminosulphonic acids, by interference with the metabolism of α-aminocarboxylic acids (McIlwain 1941), gramicidin, by affecting glucose metabolism (Dubos 1939); styryl 430 (Pourbaix 1939) and rivanol (McIlwain 1942), by mechanisms similar to that of acriflavine

Evidence from nutritional investigations is susceptible to examination in enzyme systems, and such are already known to be affected by sulphanilamide, by acriflavine (Quastel and Wheatley 1931, Dickens 1936) and by many other therapeutically interesting compounds (e g Rona and Petow 1924) Nutritional investigations, by indicating the substrate or type of enzyme affected, are a useful preliminary to such enzyme studies

TABLE II—REVERSAL OF SOME INHIBITORS

	Organism	Main constituents of basal media	Inhibitor	Reversing agent	Growth
1	*Strep hæmolyticus*	Bactopeptone + glutamine	None Sulphanilamide ,, 	None None Yeast extract Yeast concentrates *p* aminobenzoic acid	+ 0 + + +
2	*Staph aureus*	Amino acids nicotinamide aneurine	None Pyridine 3-sulphonic acid ,,	None None further nicotinamide	+ 0 +
3	*P vulgaris*	Ammonium lactate + nicotinamide	None α aminosulphonic acids 	None None α amino carboxylic acids	+ 0 +
4	*Bact coli*	Ammonium lactate	None Acriflavine components ,,	None None (i) yeast extracts or (ii) tryptic casein (i) nucleate or (ii) amino acids	+ 0 + + + +

References (1) Woods 1940 (2) McIlwain 1940b (3) McIlwain 1941 (4) McIlwain 1942

STRUCTURAL SPECIFICITY OF INHIBITOR

In addition to systems directly investigated, this method of approach makes understandable many general characteristics of chemotherapeutic action which otherwise are difficult to interpret This and the following paragraphs deal with such phenomena The high specificity of particular structures for chemotherapeutic activity, which has been the subject of many remarks is readily understandable if the drug is to act on particular enzyme systems Many such systems show extremely high specificity for substrates or coenzymes as may be indicated by the specificity of typical growth-factors of which details are given in table III Other inhibitors are much less specific in their action, though definite structural optima are exhibited Similar phenomena are encountered in relation to enzymes which act on more than one substrate

In the absence of other guides to the preparation of therapeutic agents it has become a practice in organic chemistry associated with chemotherapy to incorporate in one molecule groupings of two or more active agents with the intention of producing a still further active compound Few of the "hybrids" so formed are more active In terms of the present ideas such relative lack of success is readily understandable (McIlwain 1940c) There is probably a high degree of structural specificity between each inhibitor and a corresponding enzyme system or substrate (cf figure) Unless the "hybrid" also corresponds to an essential natural substance it is unlikely to be more active Known essential substances, such as vitamins, are very diverse in structure

TABLE III—SPECIFICITY OF BACTERIAL GROWTH FACTORS

	Growth factor		No of analogues		Notes on active compounds
	Compound	Organism	Tested	Active	
1	Nicotinic acid or amide	*Staph aureus*	15	1	Easily converted to (1) in vitro
2		*Shigella paradysenteriæ*	25	8	Mainly esters and all easily converted to (1) in vitro
3	Aneurine, thiazole component	*Staph aureus*	14	3	Active to much lesser degree than (3)
4	Aneurine pyrimidine component	,,	12	2	Altered at a group which is lost in functioning
5	Uracil	,,	23	0	One group of four compounds was active
6	Glutamine	*Strep hæmolyticus*	21	0	Some active under conditions permitting conversion to (6)

The analogues are in all cases the most closely related substances available

References (1) (3) and (4) Knight and McIlwain 1938 (2) Dorfmann et al 1939 (5) Richardson 1936 (6) McIlwain 1939

SPECIFICITY OF INHIBITOR TO ORGANISM

At this point is made the transition from toxicology to chemotherapy which requires differential action of inhibitors The following examples illustrate the biochemical attitude to such phenomena Woods (1940) has argued that organisms relatively insensitive to sulphanilamide are those which in normal growth produce *p*-aminobenzoic acid in excess of their needs and in quantities which sulphanilamide cannot completely displace from their enzymes *Bacterium coli* known to synthesise excess of nicotinamide derivatives is not affected by inhibitors which interfere with nicotinamide metabolism while *Staphylococcus aureus Proteus vulgaris*, and *Streptococcus hæmolyticus*, which cannot perform all such syntheses, are inhibited (McIlwain 1940b) An aminosulphonic acid can inhibit differently different strains of *P. vulgaris*, and with different strains the same inhibitor can best be reversed by different aminocarboxylic acids (McIlwain 1941) It is considered that the particular strains need most critically different aminocarboxylic acids, and can meet these needs to different such cases, and the patient is often unaware of the burn if he has had a whole thickness graft because the graft is insensitive He may therefore not come under observation until an ulcer has formed in the middle of the grafted area Such an ulcer is of the trophic type and takes a long time to heal

Superficial X-ray therapy—In the after-treatment of extensive burns superficial X-ray therapy can play an important part If there is any suggestion of a keloid scar this form of treatment should be adopted at once Every burn centre should have a superficial therapy set not only for treating cases of keloid formation after healing of the burn but also for those cases in which extensive skin-grafting has been performed and there is a danger of excessive formation of collagen between the grafts (fig 12) Where excessive fibrous tissue has been formed it will melt away under the influence of X-ray treatment and the whole grafted area finally assumes a smooth surface with no irregularities whatever In the follow-up of burn cases whenever there is an indication of keloid formation the patient should be sent for X-ray therapy because the earlier a keloid is discovered the easier it is to cure, and less radiation is required in the early stages In keloid cases which are seen late—and they do occur when no follow-up exists—X-ray treatment should also be given and if the result is not satisfactory complete excision should be performed followed by skin-grafting When healing has taken place in eight or nine days and the grafts have healed soundly another X-ray application should be given to prevent a recurrence of the keloid A month later a final X-ray treatment should be given With this procedure excellent results are obtained in cases which were often thought to be hopeless

12—Extensive third degree burn of leg after much skin grafting Early keloid formation A most suitable case for superficial X-ray therapy

REHABILITATION

While it is important to follow up burn cases for fully six months it is also important that these patients should not be submitted to extended hospitalisation Patients with extensive burns, especially if skin-grafting has been employed, should be moved to a convalescent home as soon as healing is complete Change of scene and company helps to sustain the morale of patients who have suffered much and during their immobilisation have had time to think about themselves, their injury, their homes and their future In the convalescent home or rehabilitation centre the patients must be encouraged to exercise their minds as well as their burnt parts Games and competitions are excellent in raising morale and improving the patient's several well-being In the past no-one seems to have thought that a burnt patient requires any rehabilitation This war has completely changed our conception of what is necessary in such cases

Rehabilitation centres should be instructional and curative intitutions where many people play a part in the patient's final recovery In Service cases a man's promotion may come through while he is in hospital and therefore there must be facilities for study or instruction at the rehabilitation centre so that he may take his place in the Service when he returns Rehabilitation centres should have an outpatient clinic where patients can be seen and treatment given for part of the day while for the rest of the day they are employed in some duty at the depot, barracks or port Many of our key men in the Fighting Services may have to be invalided unless such facilities are forthcoming, and it is gratifying to know that these needs have now been anticipated

Taken as a whole the late end-results of most war burns are good if adequate after-treatment and supervision is carried out Even in cases of severe and extensive burns, if effective early treatment is applied and skin-grafting is done and there is no severe sepsis, the final results are also good It is in the severe septic burn that results are poor, and although plastic operations may work wonders as far as appearances are concerned yet the majority of such patients cannot continue in the Fighting Services because of their inability to withstand the extremes of heat and cold which may be experienced overseas

CONCLUSIONS

The factors which are essential in the final good results of war burns are (1) Absence of sepsis throughout the treatment of the burn (2) Early skin-grafting when there is total skin loss (3rd degree burns) (3) Prolonged after-treatment of the skin with lanolin (*BP*) (4) Use of superficial X-ray therapy in the treatment of early keloid or scar formation in the burnt area (5) Rehabilitation of the burnt patient (6) An adequate follow-up so that any late complications can be dealt with as soon as they arise

---

INTERPRETATION OF CHEMOTHERAPY THROUGH NUTRITIONAL STUDIES

HENRY MCILWAIN, M SC , PH D DURH
LEVERHULME RESEARCH FELLOW, DEPARTMENT OF BACTERIAL CHEMISTRY (MEDICAL RESEARCH COUNCIL), SHEFFIELD UNIVERSITY

THE experiments on which these interpretations are based grew from observations that, in the presence of certain inhibitory agents, bacteria became nutritionally more exacting Their need for more preformed substances was regarded as due to the inhibitory agents depriving the affected organisms of the use of enzymes or of essential substances by various types of interference (Fildes 1940a, b)

The methods of nutritional investigation of inhibitory action have developed from those of bacterial nutrition, which are illustrated in table I These consist of the finding of an inadequate basal medium, in which the organisms studied will not grow, and of complementary nutrients, usually tissue extracts, which when added to the deficient medium permit growth to occur Chemical fractionation of the extracts is then carried out with the aim of attributing their action to definite substances Many exact data have now accumulated from the application of this method

It has frequently been noted that the activities of substances inhibitory to bacterial growth vary with the media employed in their testing, and such observations have received exact interpretation in a similar manner, examples are given in table II The most suitable media for such experiments are the simplest in which growth of the organism being studied is optimal Nutritional needs induced by the inhibitor are then least likely to be met (and the inhibitor "reversed") by compounds preformed in the medium, but require additional materials It is thus desirable that nutritional knowledge of the organism studied should be as complete as possible The addenda are again fractionated and their concentration followed by normal nutritional techniques

MECHANISMS OF INHIBITORY ACTION

The modes of action of inhibitors have been deduced from the character of their inhibitions and reversals, from the nature and properties of the inhibiting and reversing agents, and from the natural occurrence of the latter Woods (1940) concluded that sulphanilamide acts by competing with *p*-aminobenzoic acid, by virtue of its similarity in structure, for enzymes whose functioning is essential to growth, and this view has been justified by much subsequent work Thus the essential nature of *p*-aminobenzoic acid in normal organisms has been confirmed by its isolation as a growth factor (Rubbo and Gillespie 1940), and sulphanilamide-inhibition of the metabolism of *p*-aminobenzoic acid by an isolated enzyme system has been observed (Lipmann *1941)*

Inhibitors can act also by interfering not with the substrate of an enzyme but with an essential part of the enzyme itself This has been suggested to be the case pressed otherwise The combination of acriflavine mponents with particular enzyme systems whose bstrates or nature can be suggested by nutritional vestigations refines previous observations that acriavine acts by combining with particular parts of cells ther types of biochemical interference are conceivable nd one is exemplified by Fildes (1940b) in the action of ompounds which poise media at Eh unsuitable for growth

In at least these cases investigated, it is unnecessary o suggest adsorption, orientation and killing as distinct rocesses in the action of chemotherapeutic agents dsorption at enzyme surfaces implies orientation and tself results in fatal blocking of essential processes

PPLICATIONS AND LIMITATIONS OF PRESENT METHODS

Fildes (1940b) suggested that the similarity in olecular structure between the inhibitor, sulphanilmide, and the essential metabolite *p*-aminobenzoic acid, ith which it interferes, should be applied by preparation f compounds similarly related to other growth factors everal compounds so prepared (see figure) have been ound inhibitory to bacterial growth and have provided much of the material for this paper

One expects all actions of substances on living systems to be susceptible to biochemical analyses, but nutritional investigations represent only one approach They are complementary to such methods as the preparation of inhibitor-analogues and the correlation of their activities with physical properties Thus the work of Albert and others (1941), which associates the inhibitory action of aminoacridines with a particular basicity, is consistent with a functional combination with acids which may be the nucleotides and nucleates implicated from nutritional studies (McIlwain 1942) Nutritional findings are primarily in terms of materials, and their interpretation in terms of processes is secondary and probably represents the weakest point in the above arguments—that is, in assuming reversing agents characterised by analyses of new nutritional demands are the compounds normally involved in the blocked processes of the inhibited organisms

Extraneous effects which it has already been found necessary to guard against in nutritional investigations are (*a*) factors which are not specific to the inhibitor, and which are encountered if growth of the organism is not optimal on the basal medium employed, and (*b*) cases in which abnormal interaction between reversing agent and inhibitor occurs in the absence of the organism, thus 3 4-dihydroxyphenylalanine so removes acriflavine from solution and reverses its inhibition To critics who would suggest that the findings of interrelated growth promoter and inhibitor have little more significance than that, for example hydrochloric acid inhibits growth which might then be restored by further addition of sodium hydroxide, it must be pointed out that the examination of natural sources for optimal reversing effects is an integral part of such investigations When applied to inhibition by acids such examination and fractionation would probably lead to the isolation of phosphates or natural bases as reversing agents Such buffering would presumably be the method by which organisms recover from adverse pH changes, and such buffers or bases would be the systems disturbed by the acid

SUMMARY

Micro organisms need definite substances preformed in their media, for growth to occur The metabolism of such substances is essential to growth and involves many enzyme reactions The mode of action of several compounds which inhibit growth is best understood in biochemical terms as an interference with these reactions Interference can be competitive (sulphanilamide so competes with the essential substance *p*-aminobenzoic acid for an enzyme to whose normal functioning the acid is necessary), or non-competitive (acriflavine probably combines with enzymes acting on an amino acid or involved in hydrogen transfer)

Enzymes can in many cases be regarded as corresponding to the "receptors" of Ehrlich, the structural specificity demanded of a drug is comparable to that required in a growth essential and some grouping in a drug may be "toxophoric" by virtue of its similarity to a group in a growth essential Examples are given of chemotherapeutic interference in which the interfering substance is one taking part in or replacing, the system disturbed by the drug

Different organisms need different preformed substances for growth, enzyme processes involved in their growth are different and consequently a given inhibitor can affect such organisms differently Such nutritional differences have been demonstrated between susceptible and non-susceptible species and strains of micro-organisms, and may in part explain the difference between host and parasite

This account owes much to discussions with Dr B C J G Knight, Dr H A Krebs and Dr G M Hills

REFERENCES

Albert A Goldacre R Rubbo, S D (1941) *Nature, Lond* **147,** 709
Dickens, F (1936) *Biochem J* **30,** 1233
Dorfman A Koser S A Reames H R Swingle, K F, Saunders F (1939) *J infect Dis* **65** 163
Dubos R J (1939) *J exp Med* **70** 1
Ehrlich P (1909) *Ber Dtsch chem Ges* **42,** 17 (1913) *18th Int Congr Med Lond* p 94
Fildes, P (1940a) *Brit J exp Path* **21** 67 (1940b) *Lancet* i 955
— and Gladstone G P (1939) *Brit J exp Path* **20** 334
Gladstone (1937a) *Brit J exp Path* **18,** 67, (1937b) *Ibid,* p 322 (1939) *Ibid* **20** 189
Guerrini G (1936) *Zbl Bakt* **136,** 241
Knight, B C J G (1936) *Spec Rep Ser med Res Coun, Lond* No 210
— and McIlwain H (1938) *Biochem J* **32,** 1241
Lipmann, F (1941) *J biol Chem* **139** 977
McIlwain (1939) *Biochem J* **33** 1942, (1940a) *Brit J exp Path* **21,** 25 (1940b) *Ibid,* p 136 (1940c) *Nature, Lond* **146** 653, (1941) *Brit J exp Path* **22** 148, (1942) in press, summarised in *Lancet* 1941, ii, 762
— Barnett J and Robinson F A (1942) *Chem & Ind* **61,** 96
Marks L H (1910) *Z ImmunForsch* **6** 293
Michaelis M Quastel J H (1941) *Biochem J* **35,** 518
Muir R (1915–16) *J Path Bact* **20** 350
Pourbaix Y (1939) *C R Soc Biol Paris* **131** 1306
Quastel, Wheatley, A H M (1931) *Biochem J* **25** 629
Richardson G M (1936) *Ibid* **30** 2184
Rona, P Petow H (1924) *Biochem Z* **146** 144
Rubbo Gillespie J M (1940) *Nature Lond* **146** 838
Snell E E (1941) *J biol Chem* **139** 975
von Jancsó N, von Jancsó H (1936) *Z ImmunForsch* **88** 275
West R Coburn, A F (1940) *J exp Med* **72,** 91
Woods, D D (1940) *Brit J exp Path* **21,** 74
Yorke W Murgatroyd F, Hawkings, F (1931) *Ann trop Med Parasit* **25** 351

DANGEROUS DRUGS AND THE WAR

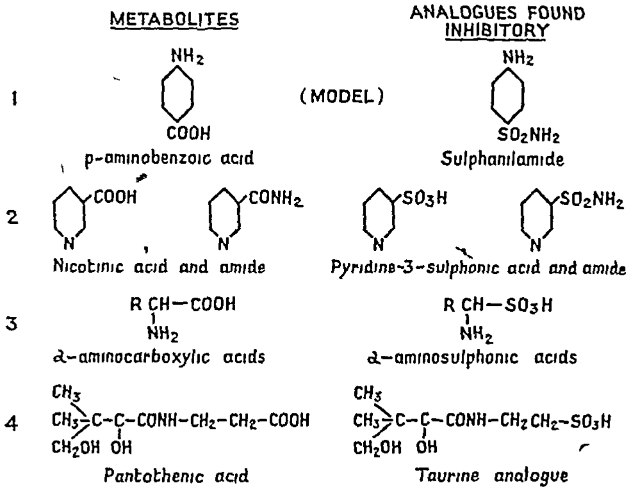
THE report of the permanent central opium board to the Council of the League of Nations on the statistics of narcotics for the year 1940, and on the work of the board during 1941 is now available That the work has been well sustained during the two years of war is remarkable, the more so since it can be claimed that the essential measures of control continue uninterruptedly Statistics required under the Conventions of 1925 and 1931 have been received from 57 metropolitan governments and 89 colonies, territories etc In several cases no reports have been furnished, but one additional accession (Paraguay) to both conventions has been notified In all the board received 163 estimates and 55 supplementary estimates The drugs dealt with are opium coca, Indian hemp morphine, heroin, codeine thebaine, ecgonine, and ethylmorphine The statistics show, on the one hand, the stocks held at the end of the previous year, the amounts produced or imported and the amounts confiscated in each region, and on the other hand the amounts consumed or converted, the amounts exported and the stocks held at the end of the year Thus the balance still available in each country can be estimated It is disappointing, however, to find no returns from some places whence information would be especially valuable Thus there are no figures for the production of raw opium in Japan In Iran the figure given is 789,900 kg, India 123,145 kg and in Turkey 218,640 kg Again, in regard to the production of coca leaves there is no return from Peru while Columbia is credited with 40 000 kg The export of morphine from the United Kingdom is given as 427 kg, and that from Hungary as 953 kg, but the quantity of the alkaloid manufactured in Japan is not vouchsafed Heroin manufactured in the United Kingdom amounted to 153 kg, none is reported from the United States On the other hand 822 kg of cocaine was manufactured in the United States as against 485 kg over here for Peru there is no figure It seems clear that the report though valuable, has significant lacunae degrees. Such differences in synthesising abilities or needs of several strains with respect to aminocarboxylic acids are already known (Gladstone 1937b, Fildes and Gladstone 1939).

Host and parasite constitute a special case in which differential action of an inhibitor is desirable. A successful chemotherapeutic agent may be such that the host cells either make less use of the particular enzymes or metabolites being affected, or produce a greater excess of the materials whose metabolism is being disturbed, than does the parasite. Similar enzymes from different sources can also themselves be susceptible to the same inhibitor to different degrees (e.g., Rona and Petow 1924). In addition, the host, being a larger organism, may have local reserves of essential materials; local susceptibilities of particular tissues are also understandable. All differences are of course not nutritional.

It may be noted that Ehrlich suggested a nutritional explanation of the predilection of particular parasites for certain hosts (cf. Muir 1915–16).

The interpretation of actions of drugs on larger parasites, such as worms, may not always be immediately in terms of the present ideas. Of the processes causing parasitic worms to loosen their grip on the gut, narcotic action is susceptible to biochemical analysis (Michaelis and Quastel 1941).

Applications of structural analogy with metabolites to the synthesis of inhibitors



References. (1) Woods 1940, (2) McIlwain 1940b, (3) McIlwain 1941, (4) Snell 1941, McIlwain et al. 1942.

DRUG-FAST STRAINS

Drug-fast strains are regarded as having been "trained" (see Knight 1936) so that they differ in their needs or synthesising abilities with respect to the essential metabolites or enzymes with which the drug in question interferes. Their production by growing an organism in the presence of increasing concentrations of a drug is essentially the same as a process of nutritional training, in which organisms are grown in the presence of decreasing concentrations of an essential nutrient. The stability of many nutritionally trained strains on repeated subculture in various media is well attested, as is the stability of many drug-fast strains. Both classes of derived organisms can preserve to a large extent the diagnostic characters of their parent strains, but differ from them in a specific manner, which with nutritionally trained organisms is demonstrably their ability to synthesise essential nutrients.

Direct correlation of nutritional training with the action of inhibitors was obtained in relation to inhibition by aminosulphonic acids (McIlwain 1941). Preformed aminocarboxylic acids are normally prerequisites for growth of *Staph. aureus* or *Bact. typhosum*, but these organisms can by suitable training be induced to grow in media lacking these amino acids, which they are then capable of synthesising (Gladstone 1937a, b); α-aminosulphonic acids are inhibitory to normal *Staph. aureus* and *Bact. typhosum*, but did not inhibit the derived strains which had been trained to synthesise their own amino acids. Drug-fastness to sulphanilamide in strains of staphylococcus has also been interpreted in terms of induced-enzyme formation (West and Coburn 1940).

To establish such processes as the reasons for strains being fast to other chemotherapeutically interesting compounds, nutritional or metabolic investigations of parent and derived strains are necessary. Metabolic differences between certain such strains have already been observed (Marks 1910).

The excess metabolite considered to be produced by drug-fast strains and to act by displacing the drug from, or preventing its combination with, essential systems in the parasite would be expected to lead to lesser adsorption of the drug by fast strains, as has been observed by Yorke and others (1931).

CHEMOTHERAPEUTIC INTERFERENCE

All the cases of nutritional reversal of inhibitions, described above, are examples of chemotherapeutic interference in its widest sense. The name was originally given to mutual effects between two compounds both of which were inhibitory agents, though interference is usually shown only at concentrations at which one component is not active chemotherapeutically.

Many common nutrients can become inhibitory to growth in certain concentrations (as enzymes can be inhibited by excess substrate) or in association with particular growth conditions. Aliphatic amino acids (Gladstone 1939) or nicotinic acid (Dorfman et al. 1939) can be inhibitory and therefore the reversal of α-amino sulphonic acids by the former and of pyridine-3-sulphonamide by the latter are true cases of chemotherapeutic interference, the mechanism being that the interfering compound replaces substances whose metabolism is affected by the inhibitor. Conversely, substances normally regarded as inhibitory can accelerate growth or metabolism under certain conditions—e.g., methyl violet can do so (Guerrini 1936)—and such would afford a basis for their interfering activities.

Classical cases also receive adequate interpretation in biochemical terms. Thus von Jancsó and von Jancsó (1936) found many cases in which the interfering compounds were hydrogen carriers and suggested that these replaced a natural hydrogen transporting system damaged by the inhibitors (*m*-amino-*p*-hydroxyphenylarsine oxide, tartar emetic and fouadin). A similar explanation has been given of interference with acriflavine inhibitions by methylene-blue and by phenazine derivatives (McIlwain 1942).

COMPARISON WITH RECEPTOR THEORIES

These interpretations have points in common with all receptor mechanisms, in that material interaction with cell constituents is considered necessary; but such interaction is defined biochemically. In reading Ehrlich's description of his receptor theories (e.g., Ehrlich 1913) one must be struck by the hypothetical existence in cells of points specially suited for combination with many compounds for which no rôle is known in normal cell reactions, such as arseno-receptors, orthoaminophenol-receptors. To the question "What is the normal function of the receptors?" Ehrlich (1909) gave the answer that they were connected with respiratory processes; actions of drugs on respiration were then well known. However, in his earlier work with toxins in connexion with which the receptor theory originated, Ehrlich had suggested that the normal function of the receptors was nutritive (cf. Muir 1915–16). Demonstration of such hypotheses necessarily awaited exact knowledge of bacterial nutrition.

In detail there are, however, important differences between enzyme and receptor theories. Thus the process of inhibition is subject primarily to biochemical analysis. The molecular structure characteristic of inhibitors is not referred to haptophore and toxophore groupings but is rather assessed in terms of essential metabolites and enzyme systems. Such molecules are regarded as capable, as a whole, of reacting with essential systems (as acriflavine) or of displacing a substrate (as sulphanilamide). In the latter case they must be sufficiently similar to normal metabolites to combine with their enzyme systems, but sufficiently dissimilar not to replace functionally the metabolites. The $-SO_2NH_2$ grouping, which simulates $-COOH$ to this degree, may be termed toxophoric but such relations are best

THE LANCET

LONDON SATURDAY, APRIL 4, 1942

DIPHTHERIA IMMUNISATION STABILISED

A FEW months ago[1] we criticised some aspects of the immunisation campaign against diphtheria and urged the importance of adequate doses of reliable prophylactics Prof G S **WILSON** and his colleagues of the Emergency Public Health Laboratory Service have now reported[2] on the results of immunising large numbers of children with two suitably spaced doses of APT They point out that earlier workers used one dose of APT and that few exact observations have been published on the two-dose method The one-dose method is now regarded in this country as unsound, but **FARAGO**[3] says that in Hungary a single dose of "anatoxine precipitate" has so far proved sufficient, because latent infection provides a constant stimulation of the antigen reaction But with increasing immunity among the population **FARAGO** thinks the amount of latent infection will decline This may result in a reduction of the basal immunity of children and necessitate a reassessment of the efficacy of the single dose The children immunised by **WILSON**'s team lived mostly in small towns and villages Preliminary Schick tests were done and accurately measured Among 30,000 children of school age the average reactor-rate was 78 3%–85 5% at school entry (5 years) to 70 4% at school-leaving age (14 years) They make the important practical observation that the omission of the control test would have resulted in an error in the readings of less than 0 2% Reactors received two doses of APT (0 1 and 0 3 c cm) at an interval of 4–6 weeks After one or other dose half developed local reactions , reactions of any severity were very rare and appeared to depend more on sensitivity than the size of the dose The few sterile abscesses that occurred seemed to be associated with particular batches of APT Seven different preparations of APT from six different makers were used Confirmatory Schick tests were done 8–16 weeks after inoculation Two preparations of very low Lf values gave poor conversion-rates (68 2% and 74%) even with increased doses Five preparations with Lf values up to 50 per c cm gave conversion-rates ranging from 97 8% to 98 4% As to optimal dosage, the investigators say that there is no agreement and any dosage recommended must be a compromise between the immunising efficiency of the antigen and the tissue reactions to which it gives rise , no practicable increase in dosage will remedy the antigenic deficiency of a poor product **BARR** and others[4] have explained that relatively weak APT will pass the official guineapig test with ease because it was designed for the old three-dose prophylactics—knowledge of APT has outstripped regulations for its control These workers postulate 50 Lf units of toxoid per c cm of APT With the important proviso that APT is of guaranteed potency, **WILSON** and his team suggest for general use two doses of 0 2 c cm and 0 3–0 5 c cm These should secure adequate immunity without unduly severe reactions which might prejudice the success of the campaign The larger first dose obviates error in the delivery of a small volume of fluid , the larger second dose provides a wider margin of safety In routine practice preliminary Schick tests are rarely called for, but post-immunisation Schick testing of samples is desirable These clear-cut recommendations should assist and reassure clinic workers

THE MINER'S BURDEN

COAL is one of the greatest of our national assets, and coal-mining a necessity But from the point of view of health and amenity coal-mining is not a particularly attractive job for the average worker Its physical demands are heavy , reasonable feeding during the working shift is difficult , its whole environment is dull and noisy, the atmosphere often an unhappy mixture of dust and damp charged with the noise of increasing mechanisation , the risk of accident is much greater than at other trades, and the housing of its workers still too often bad Mining has in the past made many men old before their time, and its wages have not always been commensurate with its hazards A good deal has been done to improve working conditions in the last few years The administration of the Coal Mine Acts has been tightened up, and the work of the Miners Welfare Committee, an organisation unique in British industry, has done much to improve conditions at the pit-head and in the communal life of mining villages It has also made possible the provision of educational and recreational facilities and of some convalescent homes, and has initiated research on the many problems of the industry Yet when all that has been said the fact remains that coal-mining is finding it increasingly difficult to get and keep the power it requires It has been found necessary to prevent men from leaving the pits to take up other work, and in some parts of the country difficulty is being experienced in getting candidates for the technical examinations which produce the overseers that are the very life blood of the industry

The recent debate in the House of Commons on mining[1] provided much food for thought for those interested in social welfare One member spoke of a youth charter for the pits Young people no longer flock to work in the industry In the old days children in mining villages, as they left school, passed more or less automatically to work in the mines Higher education was not yet, transport facilities were not developed, there was no other work available, and anyhow wages for youngsters entering the industry were relatively good , but the job was too often a dead end from which escape became progressively less possible Times have changed, and who can blame the miners and their children for looking for careers further afield ? Neither the industry nor the state can ever hope to conscript recruits for any kind of work unless it is clearly established that the work is essential to the true interests of the nation as a whole, and conducted in such a way as to offer for

---

[1] *Lancet* 1941 ii 161

[2] Fulton F Moore B , Taylor J Wells A Q and Wilson, G S *Brit med J* March 7 1942 p 315 March 14 p 349

[3] Farago F C *Deut med Wschr* 1942 68 137, *Lancet* 1940, ii, 68

[4] Barr M Pope, C G Glenny, A T and Linggood, F V *Lancet*, 1941 ii, 301

[1] See *Lancet*, March 28, p 400

Reviews of Books

The Diagnosis of Man

KENNETH WALKER London Jonathan Cape Pp 255 10*s* 6*d*

"WAR," says Mr Walker, "is a great destroyer not only of lives and property, but also of illusions", and the outbreak of destruction has stimulated him to survey afresh some of the fundamental conceptions of our knowledge of the nature of man During much of the eighteenth and the whole of the nineteenth century, in his judgment, we deluded ourselves into thinking that study of the physical manifestations of the universe would eventually bring us to a wider conception of man's place and man's nature, and encouraged by the vast strides which have been made in physiology, biology and physics we have tended to leave on one side the study of the psychic and spiritual development of mankind The philosophies and religions of the East, on the other hand, have neglected material phenomena and concentrated on the intellectual and religious aspects of human life Western philosophers and mystics have often pursued similar aims but their tenets and ideals have on the whole been submerged beneath the advancing waves of physical knowledge Mr Walker thinks it impossible that any substantial advance in the knowledge of man's nature or future can be attained by science which has been so partial in its examination of ultimate problems in this he differs from Sherrington, whose book "Man on His Nature" showed how the patient accumulation of evidence has brought us steadily nearer to conscious knowledge of ourselves and our world, and has liberated us from a great weight of fears and doubts Mr Walker seems to share the conception of the contemplative life discussed by Aldous Huxley in "Grey Eminence" mystics find within themselves some trace of ultimate reality, and by effort, by overcoming distractions, and by contemplation they can achieve at-one-ness with the absolute Huxley believes that our mystics are fewer of late, and that without their vision the people perish, but since the mystic—admittedly an incomplete and failing one—whose life he recounts helped to make the Thirty Years War and to prepare Europe for our own catastrophes, it seems possible that the people perish in any case, carrying with them, back to its source, their own share in ultimate reality Is it perhaps a little early for us, in our present semi-conscious and mentally defective stage of development, to be absolute about the absolute?

Textbook of Medical Treatment

(2nd ed) Editors D M DUNLOP, M D Edin, F R C P E, L S P DAVIDSON, M D Edin, F R C P, J W MCNEE, D Sc, M D Glasg, F R C P Edinburgh E and S Livingstone Pp 1179 25*s*

SCOTLAND'S new book on rational therapeutics has done deservedly well It is modern sensible, precise, and of the right size for the practising doctor, both in and out of hospital, and the second edition is better than the first It contains new sections on the therapeutic use of the sex hormones, on alcohol and drug addiction (already introduced in the reprinting of the first edition) and also new paragraphs on the mouth and salivary glands frost-bite, trench foot, immersion foot, chilblains, and trichinosis Knowledge of the uses of the vitamins is growing—witness the wider and more confident discussion of the B complex and of vitamin K The BLB mask now replaces oxygen tents and chambers and is the oxygen mask of choice The sulphonamide drugs get a new comprehensive review in the section on septicæmia and up-to-date consideration in other parts of the book, it is satisfactory—though somewhat academic—that eggs and other things containing sulphur need no longer be strictly avoided during their administration The psychological aspect of the patient with peptic ulcer is scarcely mentioned—a strange omission—and there is inadequate discussion of the forms of poisoning common in general practice Minor alterations and improvements have been made in many other parts of the book If its principles and precepts were studied and applied a substantial improvement in the general standard of medical treatment would result

Early Treatment of Nervous and Mental Disorders

W LINDESAY NEUSTATTER M B Lond, M R C P, physician in charge of psychological medicine, Queen Mary's Hospital for the East End London J and A Churchill Pp 379 15*s*

THE title of this book does not strictly indicate its contents Dr Neustatter explains in his preface that he found it impossible to differentiate early treatment from other kinds, and he includes sections on ætiology and diagnosis Seeing that it deals with psychological medicine the book has two outstanding merits it is distinguishable from other books on the same subject, and it is resolutely candid with the reader Dr Neustatter is an individual and not a mechanical transcriber of some psychological gospel, he is critical, reliant on his own experience, humorous, and discriminating The defects of some of these qualities appear too, such as facetiousness and a fondness for trivial recollections and obiter dicta, a careless style, sometimes colloquially easy but sinking into slipshod redundance, is the penalty no doubt of his having written the original draft, as he tells us, in railway carriages Methods of treatment are divided into psychological, and pharmacological and physiological (the latter including insulin and convulsant therapy), the treatment of specific disorders is then taken up in detail, and the disorders of children given separate description Some general considerations on the psychological treatment of physical illness, the means of disposal and certification, prevention, and indications for special methods with an appendix on war neuroses conclude a refreshing and informative little book

Rôle of the Liver in Surgery

FREDERICK FITZHERBERT BOYCE, M D, visiting surgeon Charity Hospital of Louisiana, New Orleans London Baillière, Tindall and Cox Pp 365 27*s* 6*d*

THIS winning essay for the quinquennial Samuel D Gross prize for research in surgery is outstanding The rôle of the liver does not seem to have been given sufficient attention by the ordinary general surgeon The first chapter gives an account of the hepato renal syndrome associated with so-called liver deaths The history of the subject from the time when Heyd first recognised the condition, in 1924, is reviewed and a discussion of possible explanations follows The relation of experimental autolytic peritonitis to liver deaths is traced, and there is a comprehensive and critical account of known tests of hepatic function, leading to the real subject of the essay—the information which can be gleaned from the Quick test of liver function Many case-reports point to the reliability of this simple test, which should probably be carried out more often, indeed, a disconcerting account of latent hepatic dysfunction seems to indicate that every patient who is to have an operation should be submitted to the test Dr Boyce, at all events, has a growing conviction "that an estimate of the state of the liver should be as essential a part of the preoperative routine as urinalysis or examination of the heart and lungs, without which no surgeon, no matter how somnolent his conscience may be, would place a patient on the operating table"

An Introduction to First Aid

J R M WHICHAM, M S Lond, F R C S, medical officer, Home Guard London John Bale Medical Publications Pp 84 1*s* 3*d*

THIS small book is intended to supplement but not to replace the St John textbook, and it covers the same ground in clear, compact fashion There are 14 boldly-drawn diagrams In almost every point the teaching is in line with the St John handbook, and does not go beyond it It seems a pity that opportunity was not taken to make clear to students one or two points not dealt with in the two standard textbooks—for example, that shock may come on as much as 8 hours after injury, or that fracture-dislocations have been known to occur

---

The *Revista de Tuberculosis del Uruguay* has published an anniversary number marking the completion of its first decade The Sociedad de Tisiología del Uruguay, of which this periodical is the official organ, is to be congratulated on the high standard which has been achieved and maintained Paso á paso van lejos still carries a high mortality. COLEBROOK has also drawn attention to cases infected by a sulphonamide-resistant strain of a streptococcus, and in this issue FRANCIS illustrates how troublesome such streptococci can be in the preparation of wounds for skin-grafting. D. N. MATTHEWS in his Hunterian lecture in February stated that if daily viable counts are done during local chemotherapy of a wound the count falls profoundly during the first four days, but after that there is often a slight but maintained rise. This holds good for all types of organisms examined including streptococci, and he suggested that the survivors had developed a tolerance to the sulphonamide. The strategy of attack on bacteria is, like that of human war, to attack the environment and the food. Zinc peroxide acts by creating an environment unfavourable to growth and toxin formation, sulphonamides are believed to act by interfering with an essential bacterial metabolite. The two may work together, for it has been shown that when a wound is previously treated with hydrogen peroxide local sulphonamide action is enhanced. In zinc peroxide we have a therapeutic weapon which is especially powerful against all anaerobic bacteria and the hæmolytic streptococcus. Its objection is its insolubility, which makes it difficult to ensure that it reaches the "fjords" of the wound and prevents its use in closed wounds. Its main indication is infection with anaerobes, and many more such cases would probably be revealed if anaerobic culture were done as a routine when a wound resisted treatment without obvious cause.

MUM'S THE WORD

LOCAL authorities have been exhibiting an occasional tendency to deny the press a chance to record the proceedings of their councils and committees. Not long ago the Stepney borough council was one of the defendants in litigation which revealed unsuspected liabilities to libel actions lurking even in the publication of agenda. Other councils took fright. War-time operations increase the opportunity and the excuse for secrecy. The hurried recourse to emergency committees, to which local authorities can delegate their functions (other than those of borrowing money) without restrictions or conditions, is a further discouragment to public inquisitiveness. Ratepayers, and indeed not a few councillors who find themselves outside the inner circle, are less successful than formerly in discovering what is going on. When all allowance is made for war-time necessities this restriction of publicity is unfortunate. Last year a member of a seaside town council (who was also a medical practitioner) proposed that the press be prohibited from mentioning cases of infectious diseases occurring within the district. A case of typhoid had lately been reported, and he was anxious that the public should not be scared. The council, unwilling to imitate the Riviera hôteliers who would suppress the news of local snowstorms, rejected his motion. Scares are far worse when rumour runs unchecked by public announcement. And now that MOH's reports are reduced to a shadow of their former selves the cit is far less aware of local health problems than he was. Recently the Minister of Health has issued a circular to local authorities which urges that facilities hitherto afforded to the press be not withdrawn or restricted except for reasons of national security. Where those reasons are absent, the Minister suggests, matters of public interest in the sphere of ordinary local government should continue to be debated in open session and, where administrative convenience requires that such matters be finally dealt with by an emergency committee, the question of admitting the press to the committee's proceedings demands careful consideration. The 1908 act, passed after the Tenby corporation case had established that nobody had a right to attend a borough council's meetings without its consent, begins with the declaration that representatives of the press shall be admitted to the meetings of every local authority. Then follows a proviso that the authority may temporarily exclude the press as often as may be desirable at any meeting where a majority of the councillors resolve that in view of the special nature of the business then being dealt with, or about to be dealt with, such exclusion is advisable in the public interest. A subsequent section somewhat obscurely excepts meetings of committees, but there is nothing in the act to interfere with a committee's power to admit the public to its discussions as it may think fit. What is wanted—and what the Minister of Health evidently wants—is that local bodies should not surround themselves with a veil of mystery which is the negation of democracy.

Annotations

A CHANCE FOR THE TUBERCULOUS

THE state has played an increasingly active part in the control of tuberculosis in the present century but from any list of its accomplishments there is one glaring omission: no sincere attempt has so far been made to enable the tuberculous patient to earn a satisfactory livelihood within the limits of his impaired strength. He must, it seems, obey the 'all or none' law, for there is no middle course he can follow between a return to the competitive industry that was his undoing and living a life of idleness. Economic necessity determines which direction he goes, and the figure, all too familiar to the tuberculosis officer, of the young breadwinner who has relapsed within a short time after leaving sanatorium is the result. The gap between the sheltered existence in a sanatorium and the normal life in shop or factory must be bridged if the tuberculous ex-patient is ever to regain his place in the world on an equal footing with his fellows. For this reason the decision of the Ministry of Labour to include the tuberculous in its interim scheme for the training and resettlement of disabled persons is likely to be a landmark in the history of social medicine, and the Tuberculosis Association at its meeting on Feb. 22 discussed the implications, near and remote, of the decision. Two points were considered of such cardinal importance as to justify immediate reference to the Ministry of Labour: (1) the case suitable for rehabilitation under the scheme and the type of employment for which the patient is best fitted should be decided jointly by the tuberculosis officer and the representative of the ministry with the help of the medical superintendent of the institution in which the patient last received treatment, (2) the principle of part-time employment with subsidised wages on a sliding scale must be accepted if the ex-patient is to be nursed back to normal industry. Application of the scheme to those men and women only, who are capable of whole-time employment under workaday conditions would limit its advantages to a small fraction of the tuberculous community. But we may hope that well begun is half done and look forward to a more ambitious scheme which will relieve the consumptive of his sense of frustration and help him to rediscover his soul.

the worker the greatest possible prospect of healthy survival It is doubtful even yet whether the approach to questions of production is always along these lines, and with the return of peace the mining industry will certainly not be able to get the flow of recruits it desires unless conditions of work and living are made much more attractive The medical supervision of young entrants to the mining industry should clearly be no less searching than that of young entrants to factory work, but the time is ripe for the industry as a whole—admittedly conservative—the Miners Welfare Committee, and, it may be, the State to review the entire position from the point of view of health and efficiency

STORY OF ZINC PEROXIDE

TWENTY-ODD years ago a young surgeon came back to New York from the war in France and asked his old chief for advice about his future career ALAN O WHIPPLE replied, "In the past, the surgeon has had to be an anatomist, now he tries to be a pathologist, in the future he will have to be a physiologist, a chemist or a bacteriologist"[1] The young surgeon—FRANK MELENEY it was—chose bacteriology He made the synergistic life of bacteria and anaerobic infection his special study Two types of infection have become associated with his name The first is a superficial spreading gangrene involving only the skin and due to the presence of an anaerobic non-hæmolytic streptococcus combined with a staphylococcus[2], both organisms have to be present, for the injection of either one of them into animals causes merely a mild infection, but both together reproduce this gangrene The second is a chronic extensive infection undermining and burrowing into the skin and deeper tissues, but without any gangrene[3], from this MELENEY could invariably culture a "microaërophilic" hæmolytic streptococcus, but he has never been able to fulfil Koch's final postulate and reproduce the disease in animals For the treatment of such lesions he sought for an agent that would inhibit the activity of anaerobes by continued oxygen liberation, and with the help of the biochemists, HANS CLARKE and EDGAR MILLER, chose "zinc peroxide"

This substance had been used for years as a commercial bleaching powder and has been in the French Pharmacopœia since 1926 It is not a pure compound, but is a white powder produced by the interaction of $ZnCl_2$ and Na_2O_2 and containing zinc oxide, hydroxide and carbonate (impurity in Na_2O_2), as well as about 50% of peroxides It is a powerful oxidising agent, like hydrogen peroxide liberating atomic oxygen but for much longer, and equally innocuous to living tissue Very soon MELENEY found that the results with zinc peroxide varied, its chemical composition was satisfactory, but there was often some physical defect which made the product more or less inert in terms of available free oxygen He declares that in America only one manufacturer makes a consistently effective product, and other firms have now agreed to market it for them MELENEY lays down some important rules for the use of zinc peroxide He insists that it must be sterilised at 140° C for four hours in a dry oven to render it safe, and this also in some way makes the oxygen more readily available It should be tested for activity by putting 5 grammes in water and allowing it to settle, in an hour bubbles of oxygen should appear in the sediment and lift it up With JOHNSON,[4] MELENEY has investigated the antiseptic action of zinc peroxide in vitro They have shown that highly virulent organisms—hæmolytic and non-hæmolytic streptococci, gas gangrene clostridia, the non-sporing anaerobic cocci and gram-negative bacilli—are susceptible to it, whereas *Staphylococcus aureus*, *Bacterium coli*, *Pseudomonas pyocyanea* and *Proteus* are not The hæmolysins of streptococci and *Clostridium welchii* are destroyed or inactivated by zinc peroxide, and it also adsorbs or oxidises bacterial metabolic products, for infected wounds such as fusospirochætal abscesses soon lost their foul smell Its action seems to depend on more than its oxygen-liberating properties MELENEY uses zinc peroxide as a freshly made 40% creamy suspension in water and says that if its action is to continue the dressings must be done daily, kept moist, and sealed with soft paraffin or zinc ointment It has been used with success for the dangerous human bite infections, for perirectal and deep pelvic abscesses, for gas-gangrene, for the lethal infections of retroperitoneal tissue and for wound packing, and TUDOR EDWARDS has especially praised it for chest wounds But no wound is a smooth surface, there are nooks and crooks where bacteria can linger and flourish The delivery of a poorly soluble substance such as zinc peroxide (solubility in water 1 in 40,000) to the burrows of a deep wound thus presents difficulties MELENEY realised this and in the burrowing type of ulceration recommends the additional use of oral sulphanilamide HOYLE, SPENCE, and FAULKNER[5] maintain that by dispensing the zinc peroxide in a more suitable vehicle than water its delivery can be assisted After a full study of its pharmacy they concluded that an oil—arachis oil (*BP*), still readily obtainable—is the most satisfactory vehicle The formula they recommend is zinc peroxide 10, glyceryl monostearate (emulsifier) 3, arachis oil to 100 (all by weight) There was no loss of available oxygen, even after a month of storage, with this formula The zinc peroxide made in this country did not deteriorate They show that it can also be dispensed satisfactorily as a 10% ointment in either white or yellow soft paraffin, or as a 15% gelatin suspension They have done no bacteriological studies, but clinically infection appeared to be rapidly controlled

HOFFMAN[6] thought that a full "blunderbuss" attack on an organism might be even more successful, and he therefore combined zinc peroxide with equal parts of sulphanilamide powder and iodoform with some liquid paraffin to form a paste that he termed zisp He has treated over 700 casualties with zisp, but 11 of them developed gas gangrene in spite of the zisp The local application of sulphonamides to wounds, started just over two years ago, has tended to oust rival forms of local therapy, but though the sulphonamides have given particularly gratifying results in other infections they, like zinc peroxide, have little effect on *Proteus* and *Ps pyocyanea*, which are important agents of infection in time of war, and clinical gas-gangrene, despite sulphonamide therapy, diagnosis between physiogenic and psychogenic cases, would however, Group Captain Symonds pointed out, be unprofitable Dr Aubrey Lewis spoke in detail about this problem It is not possible by psychological tests to recognise with certainty physiogenic disturbances of function, except when the structural damage is gross or localised The same difficulty about criteria prevails when other methods of differentiation are tried Such tests do not make allowance for the large part played by individual and social factors in the causation of the post-contusional syndrome A comparison was made between a group of men with this syndrome and an equal number of patients in a neurosis centre who had not had any head injury The similarities between the two groups were striking and the significant differences few the patients with postcontusional syndrome who are referred to a neurosis centre are much the same sort of people, and call for much the same sort of treatment, as the "non-organic" group Moreover among those who sustain head injury on the roads there will be a higher than average proportion of "accident prone" persons who are perhaps psychopathic and predisposed to neurotic behaviour The most potent causes of the postcontusional syndrome may be found in the situation arising out of the accident It is not only compensation and other crude advantage that needs consideration, important though it is Insecurity, loss of employment, and similar social factors operate, as well as the hypochondriacal, anxious, depressive and other latent trends made manifest and active by the threat to life, reason or health to which the patient believes he has been exposed Both the speakers stressed the value of occupational and psychological treatment in the prevention and management of these cases Group Captain Symonds held that the assessment of prognosis as early as possible, and its interpretation to the patient, were most important since many of the patient's symptoms depend on his uncertainty and fears about what the future holds in store for him Dr Lewis insisted also on the harm done by needless repetition of special investigations, and on the care that should be given to the patient's social and individual problems if the well ordered programme of rehabilitation is to achieve its aim of restoring him to health and working capacity

---

[1] See Meleney F L *Surg Gynec Obstet* 1941, 73 *Int Abstr Surg* 103
[2] Meleney, *Ann Surg* 1931, 94 961
[3] Meleney, *Ibid*, 1935, 101, 997
[4] Johnson B A and Meleney *Ibid* 1939, 109 881
[5] Hoyle C Spence, J W and Faulkner S H *Lancet* 1942, i 7
[6] Hoffman S J *Brit med J* 1941, i 785

OVERACTIVE CHILDREN IN THE MAKING

THE child who is "never still for an instant" can exhaust his family without seeming to broach his own reserves All healthy children are active, but in some this characteristic is exaggerated and coupled with other qualities even harder to manage. Russell,[1] reviewing the causes of hyperactivity, reminds us that the basis is sometimes organic, and that it is not always easy to distinguish such cases Overactive children are described as restless, wild, impulsive, nervous or fidgety, they are often aggressive and mischievous, and may have brought their parents to such a pitch of morbid expectancy that all parties are on tenterhooks, the child skirmishing to outwit the parents and the parents manœuvring to circumvent the child By the time he is brought to the clinic this preoccupation has led to other complaints—his school work has suffered he can't learn to read, he is always fighting, he doesn't mind what anybody says to him, he can't fit in with his schoolfellows The parents, willing enough at first to believe that he is not vicious but merely exhausting, come in time to believe that he is incorrigible Russell regards hyperactivity as having many components Children who become restless and impulsive after an attack of encephalitis lethargica are well known in colonies of mental defectives, in such cases the cerebral damage is in and about the basal ganglia, and probably birth injury or the infections of childhood sometimes damage the same region Electroencephalography has made it possible to demonstrate physiological disturbances in the brains of some children whose behaviour disorders would otherwise have been called purely psychogenic He suggests that the possibility of an organic basis should be considered whenever there is a combination of overactivity, significant history, poor coordination, tremors, athetoid movements, urge to talk with propulsive speech, too brisk reflexes, polyuria, palsy residuals, or signs of endocrine disturbance Organic signs, however, may be entirely lacking, and the only pointer may then be a history of a change in development or behaviour after a head injury or an infectious illness—a change, that is to say, out of proportion to all factors in the environment or emotional life Children with such an organic basis of their behaviour problem are likely to be mismanaged because their parents, unaware of any reason for leniency, treat them too strictly On the other hand, organic damage can be used as a too handy explanation of undesirable behaviour, and may lead to a defeatist attitude in treatment Russell points out that only a very small proportion of children have significant cerebral changes after infections or head injuries, that environment matters as much for a child with an organic lesion as for one with an emotional problem, and that in the management of either adjustment of the home situation plays an important part He quotes the finding of Childers that the home of the overactive child is usually disordered and chaotic Exposed to constant nagging, the child feels unwanted and insecure At school he is too easily distracted, and too impulsive to play well with others, he tries to get attention, seeks friends but cannot make them, and is regarded as a nuisance The main object of treatment must be—in the organic as well as the emotional case—to relieve the unfavourable tension between him and his parents

BLOOD-PRESSURE READINGS

THE variable factors responsible for the level of the peripheral arterial blood-pressure at any one moment are notoriously many, some can be standardised—for example, the effects of exercise, emotion, and pain, the position of the patient, and the accurate levelling of the sphygmomanometer in relation to the heart—but the correlation between the reading obtained and the actual intra arterial pressure is still not very close The Cardiac Society in this country, in collaboration with the American Heart Association, produced a useful memorandum[1] which has done much to standardise technique, but it is still unjustifiable to record pressure except to the nearest 5 mm —there can be no significant clinical difference between a reading of say 123/78 and 125/80 mm Hg Using as their standard an optical manometer to record intra arterial pressure, Ragan and Bordley[2] have investigated the accuracy of blood-pressure readings obtained by the usual cuff method in 51 relatively young adults They found that the systolic pressure as recorded by the usual clinical method was affected by both size of arm and the contour of the pulse wave, in patients with small arms the auscultatory readings are usually too low, while in those with large arms they are usually too high Occasionally auscultatory readings are 30 mm Hg different from those obtained by the intra arterial method, but excluding those with arms greater than 35 cm or less than 24 cm. in circumference and those with aortic incompetence the auscultatory systolic readings came within 10 mm Hg of the intra arterial pressure in 83% of cases The diastolic pressure recorded by the auscultatory method was usually higher than the intra-arterial measurement, the difference increasing with increasing size of the arm In accordance with general clinical experience the auscultatory diastolic pressure recorded was much too low in most cases of aortic incompetence Excluding

---

[1] Russell, I *Amer J Dis Child* 1942, 63, 94

[1] *Brit Heart J* 1939 1, 261

[2] Ragan, C and Bordley, J *Bull Johns Hopk Hosp* 1941, 79, 504

CURARE AND SPASM

THE deadly arrow poison of the South American Indians has been known to science for a hundred years, but supplies of the vine *Strychnos toxifera*, from the bark of which curare is obtained, have been difficult to come by, and the therapeutic uses of the drug have not been sufficiently wide to enforce its production on a large scale Curare acts by paralysing the neuromuscular mechanism and in toxic doses produces death by respiratory paralysis, if respiration can be maintained large doses can be tolerated Attempts have been made to use it in the treatment of convulsive states (such as epilepsy, rabies, chorea, strychnine poisoning and various tics) ever since 1867, it was used as early as 1924 in spastic paralysis, and in the last ten years it has been tried for tetanus convulsions[1] and parkinsonian rigidity Lately it has been used for patients about to undergo leptazol shock therapy, to prevent the danger of fractures and other injuries occurring during the convulsion, Bennett, who introduced this preliminary curarisation, now finds it indispensable in preventing complications of convulsive therapy[2] Results in other conditions have not been striking so much as suggestive The effects of the drug soon wear off, so that any relief it gives is short-lived Intravenously it produces its maximum effect within about 4 minutes from the start of injection and this passes off in the course of 15–20 minutes, symptoms following its injection mimic those of myasthenia gravis The patient complains first of hazy vision, after which bilateral ptosis appears followed in turn by relaxation of the face, tongue and jaws, weakness of the neck muscles, the spinal muscles, and the legs and arms and finally by shallow respiration due to weakness of the intercostal muscles and diaphragm The muscle groups become weak in the same order as those of a myasthenia gravis patient, and even the snarling smile appears, symptoms are quickly counteracted by injections of prostigmine, epinephrine or leptazol It seems possible, therefore, that curare may throw some light on the ætiology of myasthenia Bennett treated 12 severe cases of spastic paralysis in children with curare, 10 mg per 20 lb body-weight, given by injection on alternate days over 3–8 months He found that it produced a transient relaxing effect on the spasticity and reduced incoordination, athetosis and dysarthria, most of the children progressed well while under treatment—one, for example, was able to tolerate plaster casts and extension to overcome fixed deformities thanks to the drug He also reports temporary relief of painful spasm in cases of postencephalitic dystonia and arrest of movements, for the period of action of the drug, in athetosis and Huntington's chorea Even such transient relief, it seems, is welcome to the patients The need is clearly for a drug with similar but prolonged action Until recently investigation of curare has been hampered by the difficulty of obtaining the vine and by the varying curare content of plants brought from different areas In 1938 Mr R C Gill by overcoming the prejudices of the local witch doctors was able to bring back from South America the largest supply ever gathered,[3] and methods of standardising it were later simplified Bennett quotes the opinion of Burman that a relaxing effect of curare on spastic muscles is maintained long after other effects have disappeared Though he cannot confirm this finding Bennett reports that if a second injection of curare is given to animals within 1–5 hours of the first dose, less curare will be needed to produce paralysis, and the same is true of patients This suggests retention of active alkaloid in the body after the main symptoms have passed off Search for a curare substitute with a longer action has led to the synthesis of quinine methochloride, a substance with a curare like action when given either by mouth or injection In dogs it produces, in addition, a considerable drop in blood-pressure and diminished respiration It has been used successfully as a curare substitute for patients undergoing convulsant therapy, however, and in spastic patients 10–15 mg per kg of body-weight produces effects identical—unfortunately even in their transience—with those of curare Bennett has treated 8 cases of spastic athetosis and 1 of Huntington's chorea with oral doses of 3–4 g daily, with some objective, and considerable subjective, relief

HEALTH TEST FOR UNDERGRADUATES

THREE years ago the council of Sheffield University offered a free medical examination to all its students on entrance The scope and extent of the examination was drawn up after consultation with the Medical Research Council, and a form was designed for the guidance of the examinee which might be of statistical use in the future to the anthropologist The examination was optional, and the number of students who have availed themselves of it has been disappointingly small—not more than 20% The council has now decided to make the examination compulsory from the beginning of next October While in the other faculties it will be limited to what is contained in the present form, in the case of medical aspirants, something more will be required—namely, an X-ray examination of the chest Nor is that all The student of medicine will have to undergo a second X-ray examination of the chest together with a sedimentation test, when he begins his clinical studies, and again at the end of his second clinical year The object of this repeated examination of the chest is twofold it will benefit the student himself, and it will prevent him carrying infection to the patients with whom he will be in daily contact This may be a small step in furtherance of Sir Charles Wilson's wider proposals in the *Times* of March 21

SEQUEL TO HEAD INJURY

HEAD injury has been taken seriously in this war Centres have been established at which neurosurgeons and neuropsychiatrists can deal with it at all stages, in a model partnership One of the chief fruits of this organisation has been the recognition of how much can be done to forestall invalidism if doctors will remember relevant platitudes and put them constantly into practice At a meeting of the Section of Neurology of the Royal Society of Medicine on March 19 to discuss the differential diagnosis and treatment of postcontusional states, one postcontusional state was singled out as of prime importance—that late condition in which headache, irritability, fatigue, dizziness and perhaps anosmia are the common symptoms, entailing much disability which may be of very long, even lifelong, duration Much of this is preventable, as the speakers emphasised Group Captain C P Symonds defined the postcontusional state, for practical purposes, as that of the patient who has reached the ambulant stage after brain injury He may be first seen at this stage without any adequate clinical record being available to give such essential information, for example, as the duration of unconsciousness or the patient's previous constitution and pretraumatic personality These may be difficult to estimate, and in the necessarily hurried initial examination may not have been inquired into, but they throw much light on the causation and nature of the postcontusional condition Whereas air encephalography and some other special procedures may do no good or tell nothing worth knowing, discovery of psychopathic trends in the patient's personality may make clear the persistence of symptoms for which physical damage would not account To interpret this too simply as indicating the need for differential

---

[1] Cole, L B *Lancet*, 1934, ii 475, and West R *Ibid*, 1936, i, 12

[2] Bennett A E *Amer J med Sci* 1941 202, 102

[3] White Water[illegible] Magic New York, 1940

Special Articles

THE NATURAL HISTORY OF LOUSINESS

A CAUTIONARY STORY BY A FIELD AMBULANCE COMMANDER OF 1914–18

LICE first appeared in the summer of 1915 when we were encamped in Audley End Park. Cases of lousiness were few and easily controlled, but an important observation was made by a battalion MO who had been in the mental service. The first infestations were in men of a lower mental calibre than that of the rest of the company. They had not the mental calibre to compel themselves to wash when hungry or tired. Three years experience confirmed this observation, and established the need for MOs of units to know the mentality of their men and to warn company or other officers to keep an eye on them. From July to the end of October, 1916, we were in the line north of Arras where the usual anti-louse organisation was in force—divisional baths and periodical inspections. Then we left France and until July, 1918 acted as a brigade group, usually away from divisional headquarters. As a result of that experience with a field ambulance I drew certain conclusions.

(1) Lousiness is never solved, only controlled when conditions are favourable; infestation will rise again rapidly to 100% when they are not.

(2) Lousiness can be controlled to apparent extermination: (*a*) when every man in the unit can wash his whole body once a week, (*b*) when he can wash his shirt, vest and pants once a week and (*c*) can sit stark naked until these are dry again.

(3) Responsibility for control must rest with the men's officers, not with the MO. He is there to advise, to guide and to help. Any unit in which the responsibility for control of lousiness is put on the MO will be the worst in the formation. He has neither the authority nor the control over the men to enable him to do it; if he had, his whole time would be taken up with it to the neglect of all his other duties.

(4) Routine louse inspections and returns are an essential part of the control of the louse.

The later experiences of this brigade group will exemplify these principles and the various conditions that hinder efficient control. When we left the line we marched south for some days, being billeted in villages each night. Then we were suddenly switched off to an area on the Somme near Abbeville. The weather was getting cold and rainy. The men were in twos and threes in billets. They had plenty of time and good opportunity for washing, of which they availed themselves. Then we had 48 hours in the train to Marseilles, nearly a week in a "rest" camp outside the town (which for some reason unknown the men were not allowed to leave), and then a packed transport to Salonika. The voyage included several days in Valetta harbour while such things as submarines and mines were dealt with; and again, for some unknown reason, none of the men were allowed ashore. As a result of these conditions the degree of lousiness of every man in the transport reached its limit. The whole of our brigade group and half another had landed at Salonika before the divisional HQ arrived. It was then that I was roundly abused by a commanding officer of the second brigade because the condition of the men was a disgrace to the medical services. I was still only a major and not in a position to explain to him the relative responsibility of the medical services and the men's own officers; but I went into Salonika, cadged a couple of Thresh's disinfectors and got busy. Then came the rain, straight off the hills, and washed away all question of washing. By the time this had stopped the ADMS had arrived, much to my relief, and our brigade group was shifted across the bay to the town of Katerini under Mount Olympus. There I was dealing with a brigade staff and commanding officers whom I knew well and with whom I was on the best of terms. Above all we had an OC field company RE who could do anything. He converted a disused factory into baths, where we got the men washed. The brigadier issued an order that this was but a preliminary to louse control, which must be continued without intermission by the units themselves. He also ordered fortnightly louse inspections and returns.

Here let me break the sequence of travel for a note on natural history. It is quite wrong to think that the body louse will not lay its eggs on the hairs of the body. When the clothes are over-populated it will. I have seen a man in whom every hair of the body from the eyebrows to an isolated one on the insertion of the tibialis anticus was so packed with nits that it looked as though it had been dusted with flour—I do not remember the eyelashes, but the hair on the head was free. I believe it is the same with the crab louse and that this will lay its eggs on the clothing when the body is over-populated. Neither will lay eggs on the hair of clean skin. Every housewife knows that moths will visit first the parts of clothing saturated with sweat; the louse has the same preference for the corresponding parts of the body.

* * *

Louse inspections are degrading both to the officer and the man. Young officers are inclined to snigger and perhaps to be witty at the man's expense. This form of nervousness at doing an unsual and unpleasant job must be vigorously suppressed. Inspections are useless unless they are done properly. An efficient method is the following. The men fall in, single file, stripped to the waist with their braces down. Each has over his shoulder his shirt turned inside out. He stands before the officer and shows him both sides of the shirt; it is the dirty shirt that needs close inspection. The man then drops his trousers and holds his arms up in the air. Finally he turns about, puts his legs apart, bends down from the hips and placing a hand on each buttock opens these out. This unpleasant procedure is essential. The lice travel back along the hairs in the male crutch to those around the anus and along the fold of the buttock. Proper control of lice will never be obtained unless this is done.

It is essential that every man in the unit be inspected. Clerks in the orderly room, batmen, cooks and men working in the cook-house are likely to cut it, time and time again unless the inspection is made a company parade. The return should show the number of men inspected in a different column from those on the strength. There should be no quibbling over the meaning of such terms as infected and infested. One battalion showed for a time a lower percentage than any of the others, although from the condition of the men coming through the dressing station they seemed to be rather worse. A talk with the MO revealed that he and the CO interpreted the word infested as meaning there was a considerable number of lice and nits. If there were but a few they called it not infested but infected; and these were not asked for. A readjustment of meaning resulted in an initial jump-up in the return, followed by an improvement in the condition of the men going through the dressing station.

* * *

By the time we left Katerini in March we had the ideal conditions to which I referred. The men were washing themselves and their clothes in the streams of which the waters were cold for they came from the snows of Mt Olympus; but they sat about in the midday sun till both were dry, and the relatively small amount of work gave time for all to do so. Thence we had a march of a hundred miles to the hill between Lake Dojran and the Vardar. This was different from France, and even in the forward area there were streams all over the place. Back to Salonika. Ship to Alexandria—a shorter voyage than that from Marseilles—and train to Ismailia, which was only a few hours. At Ismailia there was Lake Timsah for bathing. Thence a march to Kantara with daily bathes in the canal. From Kantara another train to Deir-el-Belah, opposite Gaza, where there was sea bathing. Thence we marched inland to a point on the Wady Ghuzzi which just divides the desert from the sown. During all these moves inspections and returns went by the board, but the conditions were never such as in the move from France to Salonika. In the desert we were on a ration of water; but there was a bit over which could be used for baths with careful organisation. At the end of October my louse return was 1 in 250—a single louse in the pants of the elderly sergeant who made up the return, put there, I suspect, by the officer who did it. Then we moved off and entered Jerusalem on Dec. 9. An inspection made a week later showed a return of 100%—a jump in 6 weeks from 0·4%. It was these cases the mean auscultatory reading was 8 mm. Hg higher than the intra-arterial. Varying the width of the cuff from the standard 13 cm. to 20 cm. improved the accuracy of both the systolic and diastolic readings in some obese subjects; but in most subjects, particularly those with thin arms, the wide cuff yielded readings which were too low. Though their numbers are rather few, these workers produce figures which suggest that in people with large arms (circumference 30–42.5 cm.) the auscultatory estimate of diastolic pressure becomes an additional 3 mm. Hg too high for each 1 cm. increase in the circumference of the arm above 30 cm. They say that the sudden fading of the sounds is a more reliable guide to the diastolic pressure than their complete disappearance. These findings remind us that clinical readings of blood-pressure are merely approximate, though if recorded carefully they provide a useful guide to diagnosis and prognosis. It is clear that in plump subjects a wide cuff should be used before any opinion is given about a slight degree of hypertension.

RADIOTHERAPY OF CANCER

WITHIN the last few years two advances in radiology have revolutionised its value as a therapeutic agent. First, we can now control with exactitude the surface doses of X or γ rays; secondly, it is possible to estimate the distribution through the living tissues of radiations at various distances and in different directions from the place of their application, so that the dosage throughout the irradiated parts can be regulated with a high degree of accuracy. The calculation required before applying deep therapy, whether by X or γ rays, needs a specially trained physicist who may or may not be the radiologist himself. For the moment the facilities for using the latest knowledge in this department of medicine are not widespread, and there are formidable obstacles to their extension. Among these obstacles are the difficulties which beset the specialist in radiology. To acquire the knowledge necessary to practise this particular kind of work is a task arduous enough to discourage any but the most determined aspirant, and when he has overcome every intermediate obstruction and gained his diploma he finds that he cannot freely practise what he professes. Radiotherapy, being a relatively new form of specialism, is not allotted beds in most hospitals. Cases submitted to the radiotherapist for treatment are not as a rule of his own selection, but are filtered through the hands of the honorary staff in whose wards they are kept and under whose care they nominally remain. These disadvantages have had to be faced by every new branch of medical specialism in turn and must be attributed to human nature but they have been and will be overcome. It would be a pity, however, if the usual road is followed in this instance. The denial of hospital beds to specialists in the past led to the establishment of a number of independent special hospitals, with detrimental effects on the medical schools. There is much to be said for making a fully equipped radiotherapeutical department an integral part of every teaching hospital, with officers in charge whose status and voting powers are equal to those of any other member of the visiting staff. To such a vision there is yet another obstacle—the expense. But the war with its necessities has taught us to revise our notions of this barrier.

SULPHATHIAZOLE OINTMENT IN IMPETIGO

WORK on the use of the sulphonamides and their derivatives locally in skin and wound infections has naturally suggested their use in impetigo contagiosa. This in its turn has raised the old question whether impetigo is streptococcal or staphylococcal in origin. The prevailing view is that it may be either, with the added factor that some streptococcal cases may become secondarily infected with staphylococci, though a year ago, R. E. Hope Simpson[1] put forward a strong case for a specific "impetigococcus." A. J. Steigman[2] examined 25 cases of impetigo bacteriologically and found hæmolytic streptococci in 12 cases, *Staphylococcus aureus* in 8 cases and a combination of both in 5 cases. This prompted him to try 5% sulphathiazole in an ointment base and he found that healing took place in about 4 days compared with an average of 8 days required to obtain a cure when ammoniated mercury ointment was used. L. H. Winer and E. A. Strakosch[3] treated 60 cases of impetigo with 5% sulphathiazole in cod liver oil ointment and obtained a cure in an average of just over 4 days. They selected cod liver oil ointment as a base because it was an easy medium to use and it did not diminish the activity of the drug. They also treated 20 patients with sulphathiazole by the mouth and no local treatment and obtained cures in an average of 9½ days. Pillsbury and others[4] went further and treated a variety of infectious dermatoses with sulphathiazole, and although some of their results in other conditions were good the cases of impetigo responded far and away the best. They thought that an oil-in-water emulsion was the best base but obtained good results with an ointment. All these observers urge the importance of frequent and *thorough removal of crusts and scales before applying* the ointment, and favour application 4–6 times a day. It appears then that a 5% sulphathiazole ointment will cure impetigo in 4 or 5 days. This is a real advance on any previous method of treatment, and in so infectious a disease a reduced period of infectivity should lessen the number of contact cases. Judging by the results so far published there is no object in giving the drug by mouth.

MR A. SEYMOUR HARDING, F.S.S., has retired from the general secretaryship of the Royal Institute of Public Health and Hygiene on account of ill health. He had completed 30 years of service with the present institute and with the former Institute of Hygiene, and the good wishes of the whole fellowship go with him.

THE death is announced from Lucerne of Dr EDWARD NEUMANN who was associated with Dr Lucius Spengler in the foundation of the Schatzalp, a luxury sanatorium high up above Davos Platz. Neumann as resident had all the burden of administration, which was very well done, but he was also an essential partner in the early work on pneumothorax, for which Brauer paid occasional visits from Hamburg. As a guide and friend Neumann is still gratefully remembered by British and American ex-patients.

THE Minister of Health and the Secretary of State for Scotland have appointed a committee "to inquire into the organisation of medical schools, particularly in regard to facilities for clinical teaching and research and to make recommendations." The following have accepted invitations to serve: Mr W. M. Goodenough (chairman), Prof. T. R. Elliott, M.D., F.R.S., Dr A. M. H. Gray, Prof. James Hendry, F.R.C.O.G., Prof. A. V. Hill, F.R.S., Sir Wilson Jameson, M.D., Prof. J. R. Learmonth, F.R.C.S.E., Sir Ernest Pooley, Sir John Stopford, M.D., F.R.S., and Dr Janet Vaughan.

---

1 *Lancet* 1941, i, 683. 2 *Brit. med. J.* 1942, i, 12.
3 *J. Amer. med. Ass.* 1942, 118, 221.
4 Pillsbury, D. M., Wammock, V. S., Livingood, C. S. and Nichol, A. C. *Amer. J. med. Sci.* 1941, 202, 808.

ROYAL COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS.—After July candidates for the membership of the college may *not* proceed to the examination till their case records and commentaries have been accepted by the examination committee. At present the case records are submitted as part of the examination, but after July they must be presented not less than nine weeks before the examination. Candidates not attending for examination within three years of acceptance of their case records will be required to present a new set. Further particulars may be had from the secretary of the college, 58, Queen Anne Street, London, W.1.

power to help in their own recovery. Dr. Lloyd is also responsible for compensation in the Bolsover company, and he has proved that a doctor can do this work and still retain the confidence of the men. He agreed there is no real malingering with the injured workman.

Dr. A. E. QUINE was of the opinion that the first-aid posts in the factories should be organised and staffed by hospital-trained personnel so that they are really outposts of the hospital. The first treatment of an accident might have a great effect on the final result.

Dr. J. A. SCOTT said that hospitals should be careful not to frighten their patients by telling them details about their injury, as this might cause psychological trauma when the patient, though physically fit to return to work, would not think of taking on any sort of work. Such patients generally finished up in a long litigation and only returned to work after the financial settlement of the case had been made.

Dr. DONALD STEWART felt that the speakers had put the industrial medical officers of Birmingham on their mettle by showing that the final phase of rehabilitation was in the factory.

Dr. W. J. LLOYD, a medical officer to a big engineering works who is working in close touch with the hospitals in Birmingham and Wolverhampton, quoted figures for the first six months. In one factory injured workmen had returned to work on an average six days per person earlier than previous figures had shown. This meant a total saving of 500 working days. He also had found that cooperation with the injured workman at the works had reduced the legal complications of compensation.

THE TYPHUS GROUP OF FEVERS

THE typhus family includes a considerable variety of diseases occurring in many parts of the world. Of these, classical typhus, the most devastating of all epidemic diseases, is the most important. Classical typhus differs from every other disease of the typhus group in that it is a disease of man; it is conveyed from man to man by the human louse, *Pediculus humanus*, in which the causative organism, *Rickettsia prowazeki*, undergoes a multiplicative cycle. The other forms of typhus are essentially infections of animals and are conveyed to man by arthropod vectors not normally parasitic on man. They are therefore sporadic or endemic and not epidemic in incidence.

There is authoritative confirmation that epidemic typhus has now appeared in Europe—in Poland and other German occupied countries, and to a less extent in the Reich itself. Indeed, it is surprising that it has not made its presence felt earlier, either during the Spanish war or during the earlier stages of the present one in Poland or the Balkans. In all these areas and in south-east Russia, outbreaks of epidemic typhus are an ever-present menace. Winter conditions with the resultant exposure, the increased difficulties of personal hygiene, the reluctance of people to remove the large quantities of clothing piled on to keep warm, and the tendency to crowd into dwellings for the same purpose, all favour the multiplication and the dissemination of the human louse, and the stage is thus set for explosive outbreaks of the disease.

Lice infected with the causal organism are themselves ill, and their lives are shortened to about two weeks. They become infected by ingesting the rickettsia-infected blood of persons during the febrile periods of an attack of the disease. Lice do not transmit the infection hereditarily to their offspring. The infection is conveyed to man via the intestinal tract of the lice, whose infected fæces contain the organism, and this enters the human body through abrasions in the skin which result from the scratching excited by the presence of the vermin and their dejecta. Louse fæces may remain infective for ten days or more at room temperature; this fact is important because such fæces, for example on linen, may become air-borne and alight on mucous membranes, or be inspired, and cause infection in people who are themselves entirely free from louse infestation. Sporadic cases of epidemic typhus may thus occur among doctors and nursing personnel. The avoidance and the limitation of the spread of epidemic typhus are essentially bound up with control of the vector. The question of immunisation by prophylactic vaccination against epidemic typhus is a vexed one. Up to the present, unfortunately, no safe and thoroughly effective method of immunisation for use on a large scale has been devised. It has been found, broadly speaking, that vaccines prepared from killed organisms are at best incompletely effective, while those prepared from living organisms may be dangerous by producing a severe attack of the disease. The numerous infections arising among skilled laboratory personnel working with *Rickettsia prowazeki* constitute cogent evidence of the difficulties to be overcome in immunisation by any vaccination technique at present available.

MURINE TYPHUS

Some other diseases of the typhus group are likely to be encountered in the world-wide sphere of the military operations now in progress. The flea-borne murine typhus of man is normally an infection of rats, and is spread from rat to rat by the rat-louse, *Polyplax spinulosa*. The rat fleas on infected rats can acquire the infection and certain of them may transfer their attention temporarily to man. *Xenopsylla cheopis*, one of the fleas associated with the transfer of plague from the rat to man, is an example; but in murine typhus it is the infected fæces of the flea which convey the infection, and not the bite as is the case in plague. Murine typhus is found in many parts of the world, but the cases in man are sporadic, and in the Mediterranean and Eastern zones at any rate the disease has not so far been shown to pass from man to man. In Mexico, however, there is evidence that cases of murine typhus may give rise to the epidemic disease with the human louse taking on the rôle of vector. If this is eventually proved to be so elsewhere it would provide a satisfactory explanation of the mode of maintenance of epidemic typhus in the interepidemic periods. At present it is conjectured that in Europe latent and mild cases keep the infection in being between epidemics. That infection after an attack of the louse-borne epidemic disease may persist in individuals for very long periods is shown if it is accepted that Brill's disease is a recrudescence of the infection, as has been postulated by some American workers.

The causal organism of the flea-borne murine disease is so similar in most respects to that of the louse-borne epidemic disease of man that there seems to be no adequate reason for differentiating the two specifically in nomenclature. The epidemic human infection probably originated from the rat infection and has become biologically adapted to man and to his own louse, and it appears largely to have lost its power of return to the rat and to the ectoparasites of that animal. An attack of murine typhus protects man against a subsequent attack of the louse-borne disease, and vice versa.

ALLIED DISEASES CARRIED BY TICKS AND MITES

The tick-borne typhus diseases, of which the varieties of Rocky Mountain spotted fever are the most important, are also accidentally and sporadically acquired by man from small mammals. The intermediaries here are ticks of sundry genera and species, and these ticks apparently become infected in their larval or nymphal stages from rodents. Infected ticks, unlike the louse and the flea, transfer their infection hereditarily through a series of generations, and infection is conveyed by the bites of the infected ticks. Tick-borne typhuses are endemic in America, East and South Africa, the Mediterranean basin and India. The causal organisms differ in many respects from the human louse-borne rickettsia and consequently have been relegated to a different genus, dermacentroxenus. Sundry species of this genus have been described, *D. rickettsi* being the name given to that responsible for Rocky Mountain spotted fever in man. Fièvre boutonneuse, or Marseilles fever, is acquired from dogs by the intermediation of the common dog tick, *Rhipicephalus sanguineus*. In this condition there is usually a primary sore (tache noire) at the site of the infecting bite. The course of the fever is similar to that of Rocky Mountain spotted fever of a mild type. This disease and the tick typhuses of Africa and of India are all relatively rare.

The remaining fevers of the typhus group are mite-borne, and consist of a number of closely related, if not identical, conditions. Here again the infections are normally rodent and are sporadic and in a sense accidental in man. Tsutsugamushi or Japanese river fever, here that we first had news of typhus among the Turkish troops that had left, and one medical unit had some cases after unwittingly taking over a building that had been the typhus hospital. We were in the hospital of the Russian colony to which there was a good laundry attached. Fuel was the difficulty, but we used our own intelligence. During the night ramshackle wooden buildings in the compound used to tumble down, and by day the sergeant-major, with all the cravings of a housewife, turned on a party to clear up the mess. But orange-peel was our chief standby. We collected all this and dried it as meticulously as Dr Johnson did, and as fuel this would run the laundry for days.

We were off again in February, down into the Jordan valley and up into the mountains of Moab where we got some typhus, but we did not know at the time. To us they were men with headaches and pyrexia, to go down the line. We learnt of it from the base when we were back in the Judæan hills encamped in olive groves in April. So *we set out to deal with the clothes* and blankets of the brigade. We got hold of three Thresh's machines from two divisions. Then came the question of fuel. I told the brigadier that the ration we should get from the ASC was only that which the experts at the sanitary school at Aldershot needed for a day's work in peace-time. My men by then were probably as expert in working them but we intended to do so for 24 hours on end for many days. It was a heinous crime to touch an olive tree. "You're not cuttin' down trees," the corps commander had said to me in Jerusalem. "If you go cuttin' down trees Allenby will hang you first, and then he'll draw and quarter you, and boil the remains." So the brigadier sent for the RE officer, and under his supervision the REs improved the olive grove by cutting off the dead stumps of broken branches. We pitched two operating tents by the Thresh's, and there at night sat the men looking after the contents of their pockets, smoking and playing cards, while their clothes and their blankets went through the Thresh. By day they lay about outside, till the sun got too strong, in number about 4000. One thing about the Thresh is you must not pack it too tight. If you do you apply a soothing warmth and hatch out every louse. And again the brigadier sent round a warning note to the effect that we made no claim to have de-loused the brigade, merely to have put it in such a condition that the continued efforts of all concerned could keep the louse in control. Control and not extermination is all that can be expected.

REHABILITATION OF THE INJURED WORKER

AIMS AND METHODS

AT a meeting of the Birmingham Industrial Health Group held at the Birmingham Accident Hospital on March 13, with Mr MUSGRAVE WOODMAN in the chair, Mr WILLIAM GISSANE, clinical director of the hospital, opened a discussion on

Rehabilitation as it Affects the Industrial Medical Officer

which, he said, was the start in Birmingham of a serious effort to deal with the problem of the injured workman. Help outside the hospital is essential—the employer, the industrial medical officer, the welfare officer and the representative of the workman each have a part to play. Mr Gissane looks to the industrial medical officers for cooperation in many matters, not least because as members of the works executive administration they speak with authority for the employers. For instance, when a seriously injured workman is admitted to hospital his chief worry is the insecurity of his future. If the industrial medical officer can give the hospital the management's assurance that the man will be reinstated at the end of his treatment, the hospital could set the patient's mind at rest and a step forward in his recovery would immediately have been achieved. The Birmingham Accident Hospital hopes that the industrial medical officers in Birmingham will visit their injured workmen regularly while in hospital. This will not only satisfy their clinical interest in the patient's treatment and progress, but will give the workman the knowledge that the works, through their doctor, are interested in his welfare and in his recovery.

At the end of treatment, even if a patient has been made physically fit by an intensive course of rehabilitation, he is not fit enough, particularly in the heavy industries, to return at once to his former work. For example, a miner cannot leave a rehabilitation centre one day and go back to a full shift at the coal-face the next. The workman needs a period of trial occupation during which he is stepped up gradually by a series of jobs to his former occupation. The cooperation of the works doctor at this stage is invaluable. If he is fully conversant with the nature of the injury and its treatment, he can choose the right series of jobs in his factory to fit the patient for his old occupation. Even if he fails to return the workman to his old occupation, he can at least re-educate him to be a useful unit to the factory and a self-respecting member of the community, which is better than paying him a lump sum in compensation and taking no further interest in his welfare.

A CENTRE IN BEING

Mr E A NICOLL showed a film of the methods of rehabilitation used at the Miners Rehabilitation Centre at Berry Hill Hall. Behind the graduated physical exercises suitable for the different types of injury, the team games and the occupations the real aim is always to build up under medical supervision the weakened structures of the body. Getting well is a full-time job and each patient's daily treatment covers a full working day routine. Only about 20% of all those injured need this special treatment. They are selected because of the severity of their injury or because of their resistance to treatment. The rehabilitation centre at Berry Hill Hall has to return its patients to the mine, an industry which imposes great physical and psychological stresses. The average age of the patients is over 40. In spite of these disadvantages the centre has succeeded in getting 95% of the men back to the mining industry—50% had gone back to work at the coal-face and 45% to "lighter work." True light work in the coal mining industry does not exist, and this "lighter work" would be considered full work in any other industry.

The management of the Bolsover Colliery Company were prepared to be inconvenienced in reinstating an injured workman and in 400 consecutive injuries from this company 398 men returned to work, all but 18 going back to full pre-accident work. The test of treatment is thus not the clinical judgment of the surgeon, but the ability of the injured man to go back to his job. Since the existence of the centre litigation between the injured workman and his employer had been eliminated.

Mr G DE G WARREN, speaking from the mine owners' point of view, said that the centre had solved a big problem. When they had only fracture clinics, in spite of excellent services they found that they had a large number of men who, when they had finished hospital treatment, were still unable to do any job of work. No man is admitted to the centre without being told that a job awaits him as soon as he got well. The cost is not frightening. For his industry, employing 100,000 men, the cost of the rehabilitation centre is only £5000 a year. That is the economic side of the whole thing, but there is also a humanitarian side about which employers do think seriously, in spite of the general view to the contrary.

Dr R F JONES asserted that after an injury an industrial worker does not malinger. He usually displays great pluck in overcoming the effects of an injury. The workman wants organised and skilled help to return him quickly to his full working capacity, and with the help of the employer rehabilitation is now prepared to give that help. It would be found that the workman will take full advantage of the opportunities now made available to him.

RECOVERY AND COMPENSATION

Dr N F LLOYD, medical officer of the Bolsover Colliery Company, said the figures Mr Nicoll had quoted were good, but they were obtained only through cooperative work between the surgeon, the industrial medical officer and the management. He could not tell how such results *are obtained* although it is not a secret, but he thought it had something to do with personal contact with the injured men. The industrial medical officer must have the confidence of the men and once the men realise that they are getting a square deal they do everything in their ulpeper recommends, however, orchidectomy for an ld-standing large hydrocœle, and notes that solid esticular tumours are very dangerous Surgery, hower, was not so much in Culpeper's line as therapeutics, nd therapeutics then must have been fascinating to a egree The pharmacopœia contained many remedies ard to obtain, and the dispensing chemist (possessed of uch erudite botanical knowledge) must either have ad to keep a menagerie, or else employ a staff capable f catching bats, swallows, snakes, and the like To ure chin-cough, for instance, the patient must spit hree or four times into the mouth of a frog (it must be he same frog), for piles boil the fat of a roasted grey cat with its blood and make a hot local application, for sciatica a poultice of black snails, for stone a drachm of powdered dried bees in white wine, and so forth More difficult still is the cure for dropsy in which the stone vomited up by a water-snake suspended by its tail over a vessel containing water is quickly effective All these remedies have such a certain action that I am surprised I never learned about them as a student There is never a doubt expressed as to their efficacy, though sometimes alternative remedies may be applied in resistant cases I am tempted to give up my modern prescriptions for a while Sciatica is often troublesome, I must get some black snails, for the alternative remedy of stinging the painful area with nettles is impracticable in winter I don't often see vesical calculi these days, but I am rather expecting an epidemic of chin-cough in the spring when cold wet humours prevail and vitamins are short I must therefore lay in a supply of frogs and I propose no longer to recommend operations for hernias, I will bind them with Oyl of Nep if the Ministry of Supply has not commandeered it all "Back to Culpeper" shall be my cry henceforth

* * *

Being myself rather addicted to writing letters to the editor and sometimes even posting them, I am naturally interested in the mental make-up of people sharing this propensity A fortnight ago one of the thoughtful weeklies published a leader about the present state of our home morale, exhorting us in stern language, mostly worded in rhetorical questions The latter may account for the great number of letters which had arrived already for the next issue—in spite of a derisive remark in the leader about people sitting in padded chairs and writing to the papers All eleven letters published agree with the tenor of the article and try to enlighten its writer in his pretended ignorance on the real cause of our low ebb in moods Assuming that the eleven are representative, analysis shows that common disaster in war like personal disaster in all stages of life rarely broadens the outlook or reveals the more favourable character features Almost every writer finds reasons for dwindling morale in his own personal experiences or grievances The industrialist blames the high wages, the socialist inequality of sacrifice, the workman incompetent management, the vicar materialism eating into our souls, and the ex-serviceman the prospect of unemployment after the war A housewife complains about human cruelty and brainlessness in general and the Stock Exchange especially, and one writer finds that the whole war is becoming a bore—but he feels a little ashamed of himself And so did I when I reflected on the high sounding phrases of the average writer of public letters under less distressing conditions The picture would be incomplete without several writers of this series raging against the BBC It has to tell the bad news and has therefore to take the blame for it, like the doctor who has to break the hopelessness of his patient's case to relatives Be he tactful and tender, they will blame him for hiding behind the bushes, if he is straight and outspoken he will be branded as a brute—lucky if he had found a consulting specialist to tell the truth for him Experts however, like official war commentators are often uncertain and vague—and anyway it is the doctor's fault that things have gone wrong But if you and I find some gratification in comparing our little sorrows with the very big events of our national life, are we any better than the eleven correspondents ? I think we are

* * *

The doctor in our battalion has scored a major tactical victory In the teeth of opposition from company commanders he has persuaded the commanding officer that injections are not to be stopped during the month's hard training which we are going on He nearly lost the issue because there wasn't a single minute in a single day in the month to be spared, and because he suggested having it in the PT period. Our CO is very keen on physical training, and this didn't go down well Then someone suggested having the injections done after each platoon had had their weekly bath but someone else pointed out that the men had to walk five miles to their bath and five miles back again after it and jabbing them then would be carrying things a little far It was next hinted that injecting could be done after kit inspection on Saturday morning but the second in command said no, that would interfere with the ceremonial parade Then the MO, a tall dark man with a pointed moustache, a bit of a limp and smelling slightly of sulphur (we don't use benzyl benzoate in our unit), gently asked why not have a TAB parade instead of church parade The idea was a riot, the padre did his best but he had no hope against such unanimity, and the MO carried the day

---

Public Health

From the Annual Reports

CUMBERLAND

THE infantile mortality of the county rose from 55 in 1939 to 73 in 1940, but the fall in the maternal mortality from 6 7 to 2 6 is most encouraging because Cumberland has formerly had an unfavourable rate due partly to the uneven distribution of the population which added difficulties to the provision of a satisfactory midwifery service The substantial fall in maternal mortality throughout Britain since the war began is due presumably to the use of sulphonamides in puerperal sepsis, and to a rise in the number of women delivered in institutions whose confinements would otherwise have taken place in unsatisfactory homes Another possible reason for the fall is that the tension of war has reduced uterine inertia of psychological origin The rise in infantile mortality in Cumberland was due to an increase in deaths from congenital causes (126 in 1940, 105 in 1939 and 107 in 1938) and in deaths from pneumonia and bronchitis (73 in 1940, 31 in 1939 and 30 in 1938) Dr Kenneth Fraser is unable to say whether the rise in fatal respiratory disease was connected with the cold spell in the winter Throughout the country there was a rise in these infant fatalities, in some places clearly related to the severe winter but in others not Nowhere was it obviously connected with shelter life Dr Fraser says "I imagine that the rise in the deaths due to congenital debility is, to some extent a result of the upheaval attendant upon war-time conditions, general disturbance and strain evacuation in some cases, and possibly some alteration in dietary" The rise in Cumberland was about 18%, which is greater than in most parts of the country from which reports have been received If Dr Fraser is correct in his view, we shall expect a continued rise in deaths from congenital causes as the war progresses, but it must be borne in mind that these deaths were unexpectedly low in 1938 and 1939

EAST SUSSEX

This administrative county consists of 3 large towns—Bexhill, Hove and Lewes—7 urban and 5 rural districts The birth-rate for the whole county was 10 8, varying in the different districts from 8 2 in Hove to 16 6 in Rye The death-rate was 14 3, varying from 11 9 in Cuckfield to 18 3 in Rye In every one of the 15 districts the death-rate exceeded the birth-rate Infantile mortality was 47 5 against 34 7 in 1939, it varied from 20 in Bexhill to 93 in Seaford The stillbirth-rate was 31 4 for the whole country, varying from 9 4 in Newhaven to 51 5 in Hove Of the 2623 deaths registered in the urban districts 1488 were of females, and of the 2067 in the rural districts 1079 were of females, 3069 of the 4690 in the whole county were in persons over 65 years Of these aged deceased persons 1729 were females These are the statistics of a community which is fading and if we could go further with their analysis it would be easy to show that it is rapidly dying out The population is however far from normal, being heavily biased by scrub typhus or rural tropical typhus of Malaya, Sumatran mite fever and others, are names given geographically to what is now thought to be a single entity—tsutsugamushi disease. This condition, as its various names imply, is found in the Far East, where it occurs extensively. The infection in all cases is conveyed to man by the bites of larval mites of the genus trombicula. These mites in their life cycle take only one blood meal, and this during one of the larval stages. Thus the mites becoming infected by blood-sucking in one generation can only hand on the infection in the next or subsequent generations. Hereditary transmission through the mites is thus implicit in the maintenance of the organisms. The method of transmission of the mite-borne disease is by the bite of the arthropod, as is the case in the tick-borne. At certain seasons in the endemic zones the larval mites, seeking their single blood meal, climb the vegetation and await the passage of a mammal. Men working in or passing through jungle and long grass country are readily attacked by the mites and this form of typhus will probably be encountered in military operations in the Far East. There is often an initial sore at the site of the infecting bite. This lesion may be conspicuous, necrotic and persistent, or it may be an inconspicuous papule which disappears without recognition before the onset of the general symptoms and signs. The disease resultant on infection is similar to that of the epidemic louse-borne variety but milder and associated with a lower mortality. There is no cross-immunity between the typhuses carried by ticks or mites and those carried by fleas or lice. Prophylaxis against tsutsugamushi disease is difficult under Service conditions.

In England Now

A Running Commentary by Peripatetic Correspondents

Two summers ago I had just passed Anatomy and Physiology and was looking around for a nice easy job with which to pass the long summer vacation profitably. I therefore took a walk to the local public library, and consulted the Situations Vacant column in the evening paper. Crowded out by jobs for navvies, furniture-removers and men "used to heavy work," I spied the very cat's whiskers. "Wanted," it said, "a man to relieve in shop for the summer. Apply, Hygiene Stores, 100 such and such street." Next morning, clothed in my best Sunday suit, I took the tram into town and eventually found such and such a street in a most unsavoury part of A——. I looked into number a hundred's window and was shocked (I was young). I had pictured myself selling sarsaparilla root to those with bad blood, and powdered rhubarb to the constipated, but herbalism was obviously only a scientific sideline of this Hygiene Store. However, undeterred, I opened the door and walked in. A man came forward and asked me my business. He was middle-aged, about 5 ft. 7 in., with a greying moustache. After some formal talking he said I would likely get the job, and that his name was Mr. McLeod. He directed me to another shop where I spent the afternoon "learning the business," but when I got home and told my parents what sort of work I had taken on they nearly threw me out by my neck—the Scottish Presbyterian morality dies hard. After a self-conflicting sleepless night I 'phoned up the Store and told them that I was unable, after all, to accept their job. For months afterwards I went in deadly fear of meeting Mr. McLeod; scores of times I thought I saw him in the street. What would his look be when he saw me? Would he smile maliciously or would he cut me?

The scene changes. Two years later the class is seated round the bed of a man who, the clinician informs us, runs three businesses and complains of a persistent unproductive cough of a year's duration, substernal pain and a few small hæmoptyses. We lap up the physical signs—diminution of movement of left chest, doubtful swelling in the upper part of left chest, dullness in the left infraclavicular region, bronchophony and whispered pectoriloquy in the same area. The clinician calls for a diagnosis. The student sitting next to me, who has had his book signed for tuberculosis and therefore considers himself an authority, thinks that it is a clear case of phthisis. The swot of the class, who knows all the contra-indications for vitamin-E therapy in disseminated, considers that all the signs and symptoms point to a bronchial neoplasm (very tactful). I whisper to the student on my left that it is an aortic aneurysm. For (yes, you have guessed right) I see not only a patient with signs and symptoms, but also a middle aged man, about 5 ft. 7 in., with a greying moustache.

* * *

There has been comparatively little difficulty in persuading the great mass of the public to allow their children to attend a communal centre for the purpose of being immunised against diphtheria. One of the many things I want to know is why the same procedure cannot be applied to good old-fashioned vaccination against smallpox. By the terms of their contract public vaccinators are still required to vaccinate persons in their own homes, a time-wasting and unpopular business, for, as like as not, when the doctor calls he finds that the mother and child are out, or that the rest of the family has just come in to dinner, or that the baby, having had his, has just gone to sleep. Why should not babies be brought for vaccination either to the surgery or the welfare centre at a time mutually convenient to the mother and the doctor?

* * *

It is a pity in some ways that medicine has become more of a science and less of an art than it used to be. The modern physician often hesitates to make a diagnosis before two or three laboratory investigations have been made into the composition of the body fluids, and sometimes I fear he is using the old trick of appealing to mysterious agencies outside the patient's ken. The atmosphere of mystery and magic has not yet been wholly separated from the practice of medicine. Although I have grown up in this material age, I prefer the old fashioned chemist's shop to the modern drug store with its shining metal and polished glass. I like the huge flasks of red, blue and green fluid in the window, and the little drawers behind the counter, each with its gold-leaf inscribed label—"Dulcamara," "Os Sepia," "Rad. Anchusæ," and the like. Surely these products of nature *must* be more effective than our modern drugs made from coal-tar in laboratories? Yet these very laboratories are directly descended from the dark dens of the alchemists, and the properties of sulphanilamide are more miraculous than those of any elixir vitæ. It gives me a little shock, even so, when the chemist opens the drawer labelled "Gran. Paradis" and takes out Beecham's Pills, or from "Fœnum Græcum" a nail brush, while "Sang. Draconis" may have undergone a mutation to panchromatic film.

Turning the pages of the "School of Physick" (Nich. Culpeper Gent., London, 1659) it is borne on me that we moderns miss a great deal of the romance of medicine. Culpeper had a great reputation in his day, if we may judge from the eulogies of his admirers in both prose and verse at the beginning of the book. This little volume contains some surprisingly up-to-the-minute teaching. Concise chapters on the treatment of traumatic hæmothorax following stab-wounds of the chest, and on the dangers of trephining in fractures of the skull, contain little with which the present-day surgeon could quarrel. There is also an interesting account of hernias. A clear distinction is made between true herniation and scrotal tumours, although both are included under the generic term of "Herni." For a hernia, even when it contains intestine, he recommends cure by "emplaisters, and by convenient trussing and boulstering steept in the Juyce of Herbs that are of astringent and glutinative faculty." "I have seen," he continues, "many by these aforesaid medicines have been perfectly cured, yet nevertheless if for the oldness of it, that it be not to be cured by these means, then you must come to the last remedy, which is by cutting, for the execution of which I wish all men to choose an expert Chyrurgeon." He gives no operative details except to warn us that fatal intraperitoneal hæmorrhage is likely to follow an operation in which a portion of the omentum is excised without ligation. He rightly denounces those "Runnagates who under this cure of cutting the Hernies do miserably take away the stone." This misfortune occurs, he says, more commonly in children than in adults. There is thus evidence that the practice of surgery was then in hands less skilful than radical; few surgeons nowadays can have performed an accidental orchidectomy during a hernia operation.

cell types in health and in the various blood diseases For while in many cases, such as pernicious anæmia in relapse, diagnosis is easy as the interpretation of the cell distribution is obvious at a glance in other cases differential counts may be necessary Unfortunately existing knowledge concerning the distribution of marrow cells in health and disease is incomplete, and accordingly until accurate standards have been established we would urge the clinician who is not undertaking research in hæmatology to continue to rely on intelligent studies of the peripheral blood as his diagnostic mainstay

The views expressed above are not, as stated by you, "based on negative evidence" but are based on the writers' long experience in hæmatology and pathology, as well as on the study of many hundred sternal puncture films from various types of anæmia

L S P DAVIDSON
L J DAVIS
JAMES INNES

Department of Medicine,
University of Edinburgh

SIR,—One has become accustomed to regard your leaders as authoritative summaries of the latest knowledge, but your recent pronouncement on pernicious anæmia calls for comment and refutation on several scores From the views expressed in the article entitled Red-cell Shape and Size (March 14, p 325) one might conclude, wrongly I am sure, that the writer had considerable acquaintance with recent literature but very little with the clinical diagnosis of blood diseases and none with the conditions under which clinical pathologists work, indeed he might not even be aware that they exist On the technical side, it is true that sternal puncture now plays an important part in the diagnosis of obscure blood diseases, but it is certainly not the criterion of or the practice in the diagnosis of pernicious anæmia That condition can still be, and usually is, diagnosed by clinicians who recognise the clinical picture and call upon the pathologist to confirm it by means of the blood picture How often are they wrong? In the past two weeks I have seen nine cases labelled by physicians as "probably P A" Am I "open to serious criticism" that I did not even consider it necessary to suggest sternal puncture in any of them before representing them "as of the pernicious type"?

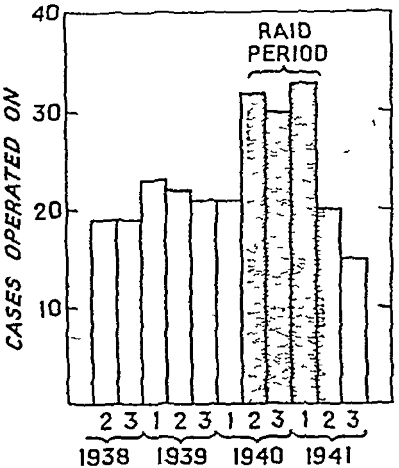
By means of a complete blood-count, backed by a halometer reading and followed by a reticulocyte count after an adequate dose of a potent liver extract, the diagnosis of pernicious anæmia was confirmed in six of the cases Would sternal puncture have been justified either for the patient the clinician or the clinical pathologist? To many patients it is a disturbing experience It would have been exceedingly difficult in the cases seen privately, it would certainly not be necessary so long as the clinical pathologist has ample experience and is what his name implies, but still less would it be justified if the clinical pathologist is replaced by the type of physician indicated in your article who leaves his 'more established procedures to computation by technicians" in order "more and more' to give personal attention to the laboratory tests needed for diagnosis" The implications of this view must be challenged Clinical pathology and those engaged in it must be given full opportunity to answer the questions put by other doctors, but can only do so when allowed to decide which procedures are necessary and not if expected to be the kind of technician-slaves to learned physicians as seems to be suggested here and in the leader of March 21 on a similar subject, they must be in a position to decide when a time-consuming procedure such as sternal puncture is indicated or can be avoided by other and simpler methods

But I am concerned with even wider implications, which you touched on in an earlier leader (Jan 24 p 110) on war time use of liver extracts It is no use talking of carrying out the hundreds of sternal punctures that its suggested use in every case thought to be pernicious anæmia would mean so long as our laboratory service is not greatly increased in size and made available to the whole population easily and cheaply, or so long as the profession as a whole is so ignorant of the place of the clinical pathologist as it sometimes appears to be Of the nine cases mentioned above three were not pernicious anæmia even on the most superficial clinical examination, and all had very low blood-counts with low colour-indices Two brought notes expressing astonishment that after two and four months treatment (respectively) with well-known brands of liver extract they had not responded! The third reached the laboratory at second hand and was recognised as a patient in whom the diagnosis of pernicious anæmia had been excluded weeks before but, it was now revealed, had had many injections of liver The latter might have had his carcinoma discovered earlier if the rôle of the clinical pathologist was better understood the former would not have afforded excuse for wasting liver extract (to say nothing of the fees the patients had paid) if our laboratory service was adequately staffed and freely available

Richmond, Surrey   D STARK MURRAY.

PERFORATED PEPTIC ULCER DURING AIR-RAIDING

SIR,—As a footnote to the article by Mr Stewart and Mr Winser (Feb 28, p 259) I enclose a graph showing the number of cases operated on at the Bristol Royal Hospital during the period from May, 1938, to December, 1941 The period of raiding was much longer in Bristol than in London From June to November 1940, there were repeated small raids and many alerts From November, 1940, to May 1941, there were occasional heavy blitzes The cases recorded include nearly all the cases in Bristol during the period in question It is interesting to note that on three occasions perforated gastric ulcers came in with blitz casualties, on one night there were two Bristol was a neutral area but the population increased until the raiding started, during the raiding period many people left the city



Cases of perforated peptic ulcer in four-monthly periods Period 1, January–April, period 2, May–August period 3, September–December

Bristol   JOHN RENDLE-SHORT

SUTURE MATERIAL

SIR,—The economy which can be achieved by the use of cotton is almost incredible One of my theatre sisters recently informed me that she had kept a record of how much I was using and made the interesting observation that I had done 46 consecutive operations for toxic goitre with one reel of Coats's no 24 black Previously I would employ 5 or 6 tubes of London Hospital catgut no 0 for the same purpose

I have only recently employed cotton freely as a ligature, but I should have used it at an earlier date because I well remember Professor Schoemaker explaining to me with pride many years ago that he did each case for a cost of less than one penny for ligatures and sutures, and he was particularly proud that it was done with Coats's English cotton I ascertained then that his cases healed very well and gave a minimum of trouble from sutures or ligatures My much lamented friend, Eric Pearce Gould, also used cotton as a ligature and suture material for many years with entirely satisfactory results It is essential of course, that when using a non-absorbable suture like cotton operative technique should be very careful and accurate I have now used cotton in goitre operations for over 12 months and I have yet to see a ligature cast out of the wound Catgut and cotton ligatures should not be mixed if this can be avoided As a cotton suture should not be placed directly under the skin I therefore suture the platysma in neck operation with fine 6,0 catgut Since using cotton ligatures for goitre operations I have had a greatly decreased incidence of serum collection under the flaps elderly persons, especially females and recruited mainly by immigration of persons beyond the reproductive ages The great variation of the stillbirth-rate in the various districts has been a remarkable feature of 1940 in all parts of the country—in large part it may be due to local differences in certification By definition at stillbirth is a fœtus over 28 weeks of age and as the date of fecundation is rarely known the age of the fœtus is settled by hearsay evidence and the state of its development, neither of which is reliable As expulsion at or about the 28th week is frequent it would make considerable difference whether the doubtfuls are reckoned as stillbirths or abortions The mother of a stillbirth is entitled to maternity benefit, but the mother of an abortion is not

IPSWICH

Dr J W Hunter's report, though much shorter than usual, retains the general plan which has characterised the annual reports of Ipswich since Dr Pringle's time As the city is one of the nearest approaches to a self-contained unit in Britain and its health history has been unusually well recorded it has always had a special interest for hygienists Its area is 8629 acres and mid-1940 population 91,230 The birth-rate in that year was 14 5, death-rate 13 9, infantile mortality 45 and stillbirth-rate 26 5 It is remarkable how the stillbirth-rate varies locally and topically. Of 1269 deaths, 748 occurred in persons over 65 years, 298 deaths at all ages were attributed to heart disease, 163 to cancer, 138 to bronchitis and 116 to cerebral hæmorrhage The high position of bronchitis in the death table is characteristic of 1940, due to the lethal influence of severe winter on old people

There were 13 deaths from diabetes, 8 in females This disease appears to be not only more frequent but more fatal in females than in males Formerly, if diabetes was mentioned on a death certificate it was given precedence over most other causes but in the new system, introduced in 1940, this is not so We know the death-rate of diabetics but we are still a long way from an accurate knowledge of the fatality of diabetes itself In a condition which though incurable is theoretically capable of complete control, the true fatality-rate is an accurate measure of the success of supervision

BEDFORD

Bedford was a reception area for children from London in the first evacuation and later for those of the south coastal towns, and Dr G K Bowes, school medical officer, estimated the school population of the borough at the end of 1940 as 7341, of whom 4827 were residents He says that the children from the coastal towns compared favourably with those from London, and "of the children evacuated to Bedford from many areas, including some coastal districts, it was surprising to note the almost universal improvement which took place in their nutrition and general wellbeing" That children from industrial cities should be less good physically than those from seaside resorts is not surprising, though the records of school inspection in past years did not altogether suggest this Dr Bowes considers that improvement of received children from all areas may be due to "the wholehearted way in which the children were received into the homes of their foster parents" but there are reasons for believing that the change from familiar to unfamiliar surroundings may act as a tonic to development "When the question of free meals for school-children was raised," he continues, "it was obvious this could not be justified in this area on the results of the examinations already carried out," for no malnutrition was detectable Originally the feeding of school-children was permitted only as treatment for obvious malnutrition, but we have shifted from this to encourage feeding as a preventive measure, so the physical state of the children is no longer the criterion on which the supply of school meals is decided

WIGAN

Dr Henry Whitehead in his report of this county borough gives the birth-rate as 16 6 against 16 4 in 1939, a corrected death-rate of 15 8 against 13 , an infant mortality-rate of 74 against 73, and a tuberculosis mortality of 0 8 against 0 85 The rise in the corrected death-rate would be alarming if it were genuine There is no glaring factor which would make the recorded rate unacceptable, the estimated population of 80,300 against 82,240 in 1939 could not, even if the fall was due solely to subtraction of persons with a negligible mortality, account for such a substantial rise in the general death-rate, and so far as can be made out from the returns there were no deaths from enemy action The ageing of the population due to the rapid decline in the birth rate in past years automatically produces a steadily rising death-rate, but this of itself is not enough to explain a rise of three points in one year In Wigan the birth-rate fell from 48 9 in 1876 to 38 7 in 1886, so for the next ten years a considerable increase in the death-rate is to be expected, but it must be remembered that it is not the birth-rate but the number of surviving infants of past years which influences the population age of today

---

Letters to the Editor

DIAGNOSIS OF PERNICIOUS ANÆMIA

SIR,—Your leading article of March 21 entitled "The Clinician and the Megaloblast" gives the impression that the clinician's understanding and successful treatment of the anæmias depend upon whether he adopts as an article of faith the "1920 model or "1940-model" megaloblast You counsel him to "stick to the 1940 model" While appreciating the novelty of infusing the polemics of academic hæmatology with the breezy style of the automobile trade, we wish to record our opinion that successful hæmatological therapeutics does *not* depend upon the fateful adoption by the clinician of one or other megaloblastic "model" Moreover, we think it unfortunate that your leading article may suggest to the clinician that sternal puncture is in any way essential for the diagnosis of the vast majority of cases of anæmia On the contrary, it should be made clear that, apart from its great value in research, sternal puncture is necessary as a diagnostic procedure only in the rare occasional case of anæmia which fails to respond to liver or iron therapy, or in which an unexplained purpura or leucopenia is the presenting feature In such cases, however, a helpful interpretation of the bone-marrow cytology can be expected only from those having considerable experience of this work

Your advocacy of the "1940-model megaloblast" as a pathognomonic cell would at least presuppose that the published descriptions of it are unequivocal and that there should be no difficulty in distinguishing it from other primitive red cells Reference to recent publications and our own correspondence with the leading salesman in this country of the "1940-model megaloblast" on this matter has failed to convince us in this respect You yourself admit "it is sometimes not easy to place individual cells" In our recent paper in the *Quarterly Journal of Medicine* to which you refer, we emphasised that it was not our intention to propose yet another classification for developing erythroblasts, and that the scheme adopted by us was solely a convenience for recording quantitatively the changes observed in the sternal marrow of cases of pernicious anæmia responding to therapy However, while we are in full agreement that the sternal marrow of cases of untreated pernicious anæmia due to lack of anti-anæmic principle in the stage of relapse is predominantly megaloblastic, it is our contention that the change is essentially quantitative and that the megaloblast per se is not diagnostic of pernicious anæmia Thus, cells identical with those seen in the relapse stage of pernicious anæmia are found very occasionally in normal bone-marrow, and in larger numbers in a variety of severe anæmias other than pernicious anæmia Full details of such cases will be published later in support of this statement In short, our contention is that in no type of anæmia is the presence in the bone-marrow of any particular red-cell or white-cell precursor of diagnostic significance The essential diagnostic feature is the frequency distribution of the various constituent cells of the bone-marrow and not the presence or absence of any particular type

This view that the interpretation of sternal marrow preparations rests essentially upon a quantitative and not upon a qualitative basis necessarily requires for hæmatological diagnosis by means of sternal puncture a knowledge of frequency distributions of the different

Parliament

QUESTION TIME

Supplies of Quinine

Sir Francis Fremantle asked the Minister of Supply the probable supplies of quinine and of raw material for its manufacture that would be available under the conditions arising from the loss of supplies from the East Indies, and *whether immediate steps were being taken to manufacture* efficient substitutes in this country —Sir Andrew Duncan replied Supplies of quinine are adequate for a considerable period. Steps have, however, been taken for the production of *efficient substitutes* —*Sir F* Fremantle *Are steps being* taken that will be sufficient to meet the probable needs of the next year or two, because we have to look ahead, and are *steps being taken in coöperation with America* and the other allied *countries* ?—Sir A Duncan The answer to both questions is " Yes "

Family Allowances

Miss Eleanor Rathbone asked the Chancellor of the Exchequer whether the inquiry into the costs and possible methods of a scheme of family allowances, which he announced last summer, has been completed, and when the results will be made available to the House ?—Mr K Lindsay asked the Chancellor whether he has noted the recent decisions of the Trades Union Congress on the question of family allowances, and whether the interdepartmental committee sitting under his guidance has now formulated any conclusions ?—Captain H F C Crookshank replied The Minister has noted the decision of the T U C General Council The investigation which he undertook in relation to family allowances is approaching completion, and he hopes to complete it shortly after the Budget

New Billeting Allowances for Evacuees

In answer to a question Miss F Horsburgh said that the *billeting* rates for evacuated unaccompanied children over five will in future be as follows

5–10 years 10*s* 6*d*
10–12 years 11*s*
12–14 years 12*s*
14–16 years 13*s*
16–17 years 15*s* 6*d*
17 and over 16*s* 6*d*

The new rates will begin to be payable during the week commencing May 1

The National Loaf

Sir Ernest Graham-Little asked the Parliamentary Secretary to the Ministry of Food whether, before making his final decision as to the constitution of the National loaf, which was to be solely provided next month, he would consider the desirability of securing the utilisation of the whole grain in the war bread in order to save the maximum amount of shipping space and to prevent the sacrifice of constituents of the grain which were lost in wheatmeal of 85% extraction and were of the highest importance to health —Major G Lloyd George replied In prescribing 85% as the milling ratio for national wheatmeal made in this country from March 23, the Government had regard to the advice of the scientific food committee and the scientific advisers of the Ministry of Food that wheatmeal of 85% extraction would be very satisfactory from the nutritional point of view Wheatmeal of a higher extraction than 85% would contain appreciable amounts of bran and indigestible fibre, the proportion of which would increase as the rate of extraction was raised The Minister does not consider that the shipping position requires him to prescribe the production of that type of flour

Synthetic Vitamin B and White Flour

Sir E Graham-Little asked the Minister what was the present position of the Ministry's plan to *fortify white flour*, and whether it was proposed to proceed with the provision of two new factories for the manufacture of synthetic vitamin B_1 and to continue the importation of fortified white flour from Canada —Major Lloyd George replied The Government's decision to prohibit the manufacture of white flour except under licence, from March 23 necessarily suspends the fortification of flour with aneurin in this country The Minister has the other matters mentioned in the question under consideration

Increase in Tuberculosis

Sir Robert Young asked the Minister of Health to what the increase of tuberculosis during the war period was due what steps had been taken to cope with the *disease* and what further steps he proposed to take especially for the safety of young persons —Mr E Brown replied The causes of the increase in tuberculosis are the subject of a special inquiry which is *at present being actively* pursued by a committee of the Medical Research Council Without anticipating their report it may be said that the predisposing factors are undoubtedly related to the abnormal conditions of living and working in war time Both the causes and the action to be taken are highly complex and cannot be dealt with adequately in reply to a question I hope to have an opportunity of *making* a fuller *statement* on this matter, particularly on the question of early diagnosis, which is undoubtedly of the highest importance and to which special attention is being given —Sir R Young When does the Minister expect to receive the report *and to make a statement* ?—Mr Brown I cannot tell but I expect that it will be possible to have a discussion on this subject at a fairly early date after the Easter recess —Sir Joseph Lamb What is the good of diagnosis when it is *not possible to treat cases because of the shortage of nurses* ?—Mr Brown We are dealing with that —Mr Rhys Davies Is it not time we had a full dress debate on the work of the Ministry of Health ?—Mr Brown I shall be only too happy if we *have one*

Medical Care of Young Workers

Major Haden Guest asked the President of the Board of Education whether, in view of the *long hours worked in war* industries, and other occupations, by young persons between the ages of 14 and 18 years, *he would extend* the system of school medical inspection to them at the beginning of their employment, and at convenient dates *thereafter* —Mr J Chuter Ede, parliamentary secretary to the board, replied Provision for the care of young workers is made in connexion with the Factory acts and other enactments, through examining factory surgeons and other doctors, through welfare officers and in other ways The Minister is *in sympathy with the* objection but he will readily understand that, under the conditions of *strain in which the school* medical service is at present working, the *Minister cannot envisage* its extension in the manner desired

Artificial Limbs for Injured Workers

Sir Francis Fremantle asked the Home Secretary if he *would consider amendment of the* Workmen's Compensation Act, as provided in most industrial countries, to make the *provision of an artificial limb* a compulsory part of benefit in any case that might so require it —Mr H Morrison *replied It is recognised that* the present arrangements in regard to the provision of artificial limbs require to be put on a more satisfactory footing but the precise form which such arrangements should take must depend on the measures for the rehabilitation of the injured workman generally It is a matter which must be dealt with as part of the comprehensive measures for rehabilitation of disabled persons which the *Government have decided* shall be prepared for introduction *as soon as possible after the end of the war* As the Minister of Labour announced on Jan 22, these measures are now being actively investigated in consultation with the ministers concerned. Meanwhile it is hoped shortly to have in operation *as part of the* war-time emergency scheme for the rehabilitation of injured workpeople such additional facilities in respect of the provision of suitable artificial limbs as may be necessary to enable the injured workman to resume *employment*

Sale of Drugs

Sir Herbert Williams asked the Minister of Health whether his attention had been drawn to the great increase *in the sale of* pre packed drugs by chain stores, and if, in the interest of safeguarding the health of the people, he would consider taking steps to restrict the sale of drugs except by qualified pharmacists —Major A M Lyons asked the Minister whether his attention had been drawn to the competition to qualified pharmaceutical chemists resulting from the rapid increase in the sale of drugs by shopkeepers who did not employ a trained pharmacist, and if he proposed to take any steps to stop this type of competition —Mr Brown replied The Pharmacy and Medicine Act of last year restricts the retail sale of some kinds of medicine to certain classes of persons including pharmacists I should not feel justified at the present time in proposing further legislation *to extend* the privilege granted to pharmacists My attention has however, been drawn to the increase which is mentioned and I shall continue to watch the situation —Mr A Edwards Would the Minister consider *fixing a fair* price for these things based on cost which would be about a tenth of the present price ?—Mr Brown That is another issue and the wounds have healed flat with an almost entire absence of tissue reaction

As a ligature and suture material therefore cotton has a lot to recommend it on the grounds of economy, especially in war-time, and the conspicuous absence of tissue reaction as compared with catgut Another advantage of cotton is that the tensile strength of the thread does not diminish with boiling The thread on the reel with which I did the 46 operations was as strong for the last operation as it was at the commencement

Newcastle upon-Tyne 2 T A HINDMARSH

RESUSCITATION IN SHOCK

SIR,—The vigorous measures advocated by Mr Layton (*Lancet*, March 21, p 366) are not a treatment of shock but a method of administering artificial respiration, the cases cited being those of collapse during induction of anæsthesia These may be due either to primary cardiac failure with secondary respiratory failure or to primary respiratory arrest with secondary collapse of the circulation Instances of the latter usually respond well to artificial respiration if it can be applied rapidly, but neither comes under the category of "shock" as discussed at the recent RSM meeting What I would like Mr Layton to make clear is whether he advocated the routine "slapping of the precordial area with a wet towel" in cases of surgical shock I feel sure that such a suggestion would have been against the consensus of opinion expressed at the meeting Speaker after speaker emphasised, among other measures, that gentleness of handling and the making of the patient comfortable both in body and in mind, were of paramount importance Surely flogging a conscious patient on the bosom is the antithesis of this

Leatherhead Emergency Hospital A H GALLEY

ECONOMY IN BACTERICIDES

THE Therapeutic Requirements Committee of the Medical Research Council has prepared a memorandum calling for strict economy in materials used as bactericides and disinfectants It is necessary not only to select those materials which are most readily available but also to reduce the total consumption Large quantities of disinfectants are used in hospital and private practice under conditions in which they are not likely to be effective Unless efficient mechanical cleansing of utensils which have contained infected material is carried out subsequent treatment with a disinfectant may be useless Two usual types of disinfectants are the mercurial compounds and the phenolic group Mercury has to be imported and it is in heavy demand for the manufacture of munitions We must therefore rely mainly on the indigenous coal-tar disinfectants Phenol itself, and certain of the constituents of cresol BP, which is the basis of disinfectants of the lysol type, are urgently wanted for the manufacture of plastics used in aircraft construction There is, however, no reason to fear any shortage of disinfectants provided the more highly purified substances are not used for purposes for which the cruder materials would suffice, and provided the coal-tar disinfectants are replaced, where possible, by disinfectants such as formaldehyde, hypochlorites and chlorinated lime

In the national interest phenol and cresol should disappear as completely as possible from medical practice For general disinfection the use of cresol with soap solutions, of the lysol type, should be reduced to a minimum and replaced by the cruder disinfectants of the "black fluid" or "white fluid" type, or for certain purposes by chlorinated lime The same is true of the chlorinated phenols, for though they are highly efficient for special purposes, such as disinfection of the skin, it is wasteful to use them where the cruder disinfectants can be employed MRC War Memorandum No 6 (Prevention of Hospital Infection of Wounds, appendix C) contains details regarding the use of disinfectants of the phenolic type for various purposes, and the recommendations which follow are partly based on the information there given

RECOMMENDATIONS

In general, bactericides should not be used when disinfection by heat is possible Heat treatment is more efficient and reliable Infected matter should be removed, with all due precautions, by scrubbing and scouring, where practicable

Instruments and suture needles may be kept in liquor boracis et formaldehydi NWF and rinsed with sterile water before use This method should not be used for hypodermic needles

Rubber tubing should be sterilised by boiling at the time of using If it is thought necessary to keep sterile tubing ready it can be autoclaved and kept in a sterile towel

Rubber sheeting—Scrubbing with soap and water is all that is necessary unless the sheeting is known to be contaminated in an exceptional way Heavily contaminated sheeting should be scrubbed and then boiled or autoclaved, if this is impossible it should be scrubbed and sponged over with rag soaked in lysol (½ fl oz to 1 pint of water) and then rinsed thoroughly with tap water

Linen should be boiled if possible, otherwise it should be soaked overnight in a dilution of a white fluid disinfectant having a Chick Martin coefficient not lower than 3 (1 fl oz to 1 pail of water is usually strong enough with a good white fluid)

Baths—Lysol, undiluted, should be rubbed thoroughly over the surface, using a mop or rag in a gloved hand, for at least a minute The bath should then be washed well with tap water

Other surgical utensils (*arm baths, bowls, dishes, &c*) should be boiled whenever possible, otherwise they should be disinfected as for baths, and washed finally with sterile water

Bed pans—If sterilisation by heat is impracticable, thorough mechanical cleansing by flushing and scouring, followed by the use of a white or black fluid disinfectant is recommended

Excreta—When direct disinfection of excreta is necessary a black or white fluid, having a Chick Martin coefficient not lower than 3, should be used in accordance with the instructions issued by the manufacturer (1 fl oz to 2 quarts of water is usually advisable)

Sinks and drains—Thorough flushing is most important Chlorinated lime is a cheap and efficient disinfectant Washing soda, 1 oz to 1 quart of hot water, may be used for cleansing glazed earthenware A black fluid, 1 fl oz to 1 pail of water, may be used as a deodorant

Floors—As a deodorant a black fluid, ½ fl oz to 1 pail of soapy water, may be used For local pollution a white or black fluid, 4 fl oz to 1 pint, should be used

PHENOL ANTISEPTICS

"Black" fluids and "white" fluids are emulsions of phenolic substances The British Disinfectant Manufacturers' Association divide British proprietary disinfectants as follows

Black fluid type Antifect, Bactocene, Coetas, Disolite, Exenol Superior, Hycol, Hygenol Fluid Disinfectant, Ialine Special, Jeyes Fluid, Kilcrobe 10/12 Black, Killgerm 10/12 Black, Lawes, Metro, Monsanto Black Disinfectant No 4, Sanitas Bactox, Septol, Special Creitas, Coopers Standard Fluid, Vitalin No 99

White fluid type Baxol, Betazone No 1, Exenol D A White, Ialine No 8, Izal, Jeyes White Cyllin, Kilcrobe 18/20 White, Killgerm 18/20 White, Lawes L W 4, Monsanto White Disinfectant Fluid No 1, Sanitasokol, Sal Hycol, *Star White*, *Sterilite*, *Superlin White*, White Bactocene, White Kerol, White Septol, Wright's Vetersol, Voxsan M A F Disinfectant Fluid

For most purposes black and white fluids are equally suitable, if of the same efficiency judged by the Chick Martin coefficient The tendency of black fluids to cause staining may be a disadvantage in some cases

---

THE ELECTRIC CONVULSION THERAPY APPARATUS manufactured by Edison Swan Electric Co to the specification of Mr Grey Walter, and marketed by the Cox Cavendish Electrical Co, is said to have several special advantages It is robust yet light enough to be portable, and incorporates several safety devices to prevent the unintentional administration of a shock Its operation is simple enough to permit even those without electrical experience to obtain consistently satisfactory results, but the range of dosage is wide enough to give scope to those more experimentally inclined It is understood that the finish may have to be modified owing to the shortening supply of certain materials, but the essential components will not be altered in any way harmful to the patient

POST-SHOCK METABOLIC RESPONSE*

D P CUTHBERTSON, M D , D SC GLASG
GREIVE LECTURER IN PHYSIOLOGICAL CHEMISTRY IN THE UNIVERSITY OF GLASGOW

THE physiological response to trauma, in particular s metabolic component, exhibits a very complex icture After an injury there is an immediate and well-marked disturbance of cellular vitality in the njured zone due to the actual damage done The capillaries dilate and their permeability increases, eading to what has been termed " reactionary œdema " and to depression of the local metabolism The effects of the lesion spread and there is a discharge of leucocytes from the bone-marrow How far some of these manifestations are due to the liberation of nucleic acid or its derivatives or to some metabolite, and how far to a vasomotor reaction, is not certain Menken (1939, 1940) has obtained a crystalline nitrogenous material which apparently increases capillary permeability and the migration of leucocytes Provided the damage done is not immediately fatal, there is as a rule evidence of what appears to be a compensatory reaction involving the vasoconstrictive-adrenaline mechanism (McDowall 1940) The local developments, on the other hand, may be such as to cause the general situation to deteriorate and lead to the development of manifest shock, the compensatory mechanism which in greater or less degree has come into effect then exhibits a definite depression The depressed stage is usually succeeded by a period when there is an increase in the local metabolism (traumatic inflammation), characterised by the increased cellular activity of the repair process, by the lysis and effluxion of the damaged tissue elements, and by what appears to be an increased and apparently generalised katabolism especially of protein

As long ago as 1794 John Hunter wrote with a rare perception " There is a circumstance attending accidental injury which does not belong to disease—namely, that the injury done has in all cases a tendency to produce both the disposition and the means of cure "

THE EBB PERIOD

It is not my purpose to discuss the problem of traumatic shock, but there are one or two aspects of the picture to which I would invite your attention Wound shock has for too long been regarded as a complication rather than as an integral part of the phenomena associated with injury The necessity for a wide conception of the response to injury was stressed by Malcolm in his classical description of " The Physiology of Death from Traumatic Fever " (1893), and within the last few months Grant and Reeve (1941) have shown that there is much to be learnt from a study of the reaction or reactions to injury, by observers with an open mind

The various theories which have been put forward to account for this phenomenon of traumatic shock seem to relate only to certain facets of this initial phase of the reaction to injury It might be described as the period of " ebb " and is characterised by a depressed metabolism It is generally recognised that other influences come into play during the initiation and perpetuation of this state—namely, anæmia, anoxia, pain and loss of body heat Fatigue and previous dehydration may, among other factors, also play a part, particularly among Service cases Hæmorrhage itself may produce an end-result like that following trauma, due to the oligæmia and anoxia produced There is, however, apparently not the same loss of capillary tone and permeability as that which results from trauma and in most cases there is a dramatic response to transfusion (Price et al 1941)

That a general depression of vitality occurs has long been recognised (Declasse 1834, Meltzer 1908), and this has been shown by Henderson, Prince and Haggard (1917) in burns to amount to a decrease in oxygen consumption of 45–50% in the cases studied Davis (1936) and others have found a reduced oxygen consumption in shocked dogs Similar changes have been produced experimentally by Aub (1920) and by Gesell, Blair and Trotter (1922) Aub found that the degree of fall in the basal metabolism of cats was roughly proportional to the severity of the shock produced, and that recovery after transfusion was usually associated with a prompt return of the metabolic rate to normal It was found that this change in metabolic rate might precede the well-marked fall in blood-pressure This is of particular interest in view of Grant and Reeve's recent observations on the blood-pressure of air-raid casualties

It is interesting to note too that Carrel (1930), when discussing the causal relations between the loss of a fragment and its regeneration, wrote " In superficial epithelial wounds, the initiation of healing seems to be due . to substances set free by the traumatised cells themselves " Harkins, to whom we are indebted (1941) for an excellent review on the subject of traumatic shock, showed in 1935 that the changes leading to true shock begin as soon as the accident or other precipitating factor takes place

The immediate result is a dilatation of the capillaries in the area affected and an increase in their permeability Later capillary systems elsewhere may be affected The vasoconstriction which results, especially in the young, is as has already been mentioned, in effect a compensatory effort to offset the decreased blood-volume and so protect the vital centres against the harmful effects of a dangerously low blood-pressure (Freeman, Shaffer, Schecter and Holling 1938) The asphyxia of the tissues may well be a factor in inducing this increased permeability (Landis 1928), or may be a result of the increased permeability Indeed it is extremely difficult to determine what is cause and what effect There is certainly a reduced venous return to the heart and so the vicious cycle is completed (McDowall 1940)

These changes are accompanied by certain profound alterations in the biochemistry of the blood which varies according to the stage of depressed vitality or compensatory reaction reached There is undoubted evidence of a profound cellular disturbance In the later stages it may be characterised particularly by a great increase in the potassium content of the blood and tissue fluids (Scudder 1940) An increase in creatine has also been noted (Aub and Hu 1920) Other changes have been observed as shock develops, such as hyperglycæmia and some degree of nitrogen retention in the blood

Local physicochemical considerations reveal that the tissues of a cleft-like and gaping wound contain more than their normal amount of fluid (Tammann, Blumel and Roese 1933) This increase occurs rapidly, reaching its maximum at the end of the first day A gradual decline then follows until normal conditions are reached again in the third week This increase in water content brings a corresponding influx of electrolytes, and from a study of their concentration it is found that potassium and calcium are increased and sodium and chloride decreased in comparison with the blood-serum

As a result of the stasis in the vessels there is an accumulation of CO_2 and incomplete products of oxidation, an apparent lessening of hæmorrhage (Quastel and Racker 1941) and pain (Piechaud 1880), and in general a stagnation of the products of cellular damage by the increased permeability and dilatation of the capillaries There is also a fall in body temperature and this while dangerous, does exert certain restrictive influences on the effect of asphyxia While a certain measure of protection is afforded by this stasis, and for that reason it is perhaps unwise to try to undo it too rapidly before its effects have come into action, it is necessary to note that unless this initial phase of the response to injury is followed by a period of enhanced cellular activity the patient will die

In shock the body temperature is in general lowered despite the diminished peripheral circulation The reduced total metabolism and volume of circulating blood are the dominant features Of all changes produced, the tissue asphyxia is probably the most dangerous to life It is interesting to recall here that John Hunter is reported to have advocated the use of oxygen It may be that the hyperglycæmia which is associated with asphyxia and hæmorrhage is an attempt to maintain the nourishment of the cells in the face of a failing blood-supply In-vitro experiments have demonstrated that the increase in permeability of erythrocytes which occurs during the storage of blood, and which leads

---

* Arris and Gale lecture given at the Royal College of Surgeons of England on Feb 18, 1942

Medical News

University of Leeds

At recent examinations the following were successful —

M D—E W Jackson and L Watson (with distinction), J Braham, C Bremer, and G H Illingworth

Ch M—O C Lord

FINAL EXAMINATION FOR M B, CH B

Part II—E K Blackburn, J G Brockis, Mary Eglington and G M Williamson (second class honours), J Abrahams Dorothy J Armitage J H Bentley, Mary Braithwaite, W L Brigg, H J Brooks J S Cason, F F Edmonds, A B Fieldsend, H Gray, Joan Hall, Mary Johnson J A Judson H S Klein C L Lacey, H Lawrence Margaret N Lea M A Lecutier H Lee R Levy, C L Lewis, L L Miller D T Milnthorpe E K Morris, E Neil, J B Raper, H Riley S Smith R M Stamp, H Stead, W S Sutcliffe, Eva Waller, and A C Woodmansey

D I H

Part I—Frances E Brierton, A G Hick, Joan M Raper, Jean F Thompson, and R H Watson

University of Liverpool

At recent examinations the following were successful —

FINAL EXAMINATION FOR M B CH B

Part I—Muriel C Andrews Stella Booth, Margaret P Diamond, A Griffith J E Hall D A Harbord, D A Kininmonth, R V Kinnish, V Leitner, Margaret J Lezama, Barbara K Thompson and R S Williams

Part II—Mary A R Allan, K W Boggis N Broughton F D G Kirkwood, A J Robertson, P L Robinson, L Scott and K H Slatter

University of Sheffield

At recent examinations the following were successful —

FINAL EXAMINATION FOR M B, CH B

Parts II and III—Alan Stanworth and H B Stoner (first class honours), E A Broomhead, T E Cleghorn Mary Darlow J F B Edeson, Harry Kelsey, H I le Brun, Gwenol Nicholson, J H Schofield and H J Towle

University of Dublin

On March 19 at the school of physic, Trinity College, the following degrees were conferred —

M B, B Ch, B A O—T J N Bates, T A H Black, Gladys M Byers, Catherine E Craig, Cecilia J Dippenaar, Muriel Eakins, M B Flanagan, S D Killen, A G Lee, C W Lloyd, A M Russell, G F Shaw, Florella Starritt and K J Swanepoel

Medical Superintendents Society

The annual meeting of this society will be held at BMA House, Tavistock Square, London, W C 1, on Saturday, April 18, at 2 P M

Royal Society of Medicine

The clinical section of this society will meet at the Middlesex Hospital on Friday, April 10, at 2 15 P M On April 11, at 11 15 A M, the section of orthopædics is holding a meeting at St Nicholas's Orthopædic Hospital, Pyrford, Surrey The following papers will be read Mr George Perkins, practical points in connexion with amputations, Mr R H Young, prophylaxis and treatment of knee stiffness following fracture of the femur, Colonel W Rowley Bristow, treatment of fractures and joint injuries in the present war, Mr B H Burns, use of internal splints, and Mr Ronald Furlong, use of the Roger Anderson apparatus

London School of Hygiene and Tropical Medicine

During the war detailed accounts of the work of this school will not be issued, but the report for 1940–41 by the acting dean, Lt Col G S Parkinson, summarises succinctly the activities of the various departments, and it seems that some at least of what has been lost on the swings has been made up on the roundabouts Members of the staff have been seconded for war service, equipment has been transferred to the Emergency Public Health Service, some rooms have been damaged by enemy action, but the headquarters staff of the MRC, some of the laboratory staff of the Ministry of Health, several departments of the University of London, and members of the staff of the Rockefeller Foundation have been stimulating guests The Seamen's Hospital Society still holds two outpatient sessions a week at the school, and an ARP wardens post is housed in the basement The library continues to have many readers and the staff have answered many bibliographical questions especially about nutrition and bacteriology There are now over 28,000 bound volumes on its shelves but the discontinuance of periodicals from enemy and enemy occupied countries has reduced the number of current journals from 430 to 245

Medical Casualties

Surgeon Lieutenant J D James, M R C S, R N V R, H M S *Belmont* has been posted as missing

London Jewish Hospital Medical Society

A meeting of this society will take place at 2 30 P M on Thursday, April 16, at BMA House, Tavistock Square, W C 1 Dr Maurice Marcus will read a paper on the psychology of the doctor, Dr A Herzberg on short treatment of neuroses and Dr J Loewenstein on the application of a coitus training apparatus in the psychological treatment of impotence

Nutrition Society in Scotland

The Scottish group of the Nutrition Society at its first scientific meeting held at Perth on March 14, under the chairmanship of Dr Andrew Davidson, chief medical officer of the Department of Health for Scotland, considered the food requirements necessary for health and the evaluation of standards In the opening paper Sir John Orr pointed out that the consumption of different factors in diet varied with purchasing power and that the diet of the poorest classes of the people was deficient in the relatively expensive protective foods In recent years there had been an improvement in the diet of this country, particularly of the poorest third of the population, but there was still urgent need for a great increase in the production and consumption of protective foods, especially milk Dr D P Cuthbertson discussed standards for proximate principles, Mr J Duckworth, D Sc, standards for minerals, and Surgeon Lieut Commander C C Ungley standards for vitamins In the second and third scientific meetings of the group there will be discussions on requirements in terms of food and on signs and symptoms of dietary deficiencies

---

Dr ASTLEY CLARKE has been appointed Sheriff of Rutland

GLAXO LABORATORIES inform us that as the Ministry of Food has called for a reduction in the use of vitamin A for pharmaceutical and medical preparations, the potency of 'Adexolin' capsules has been changed These capsules now contain 4500 I U instead of 6000 I U of vitamin A and 900 I U of vitamin D

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export

Appointments

The following examining factory surgeons have been appointed

ADDENBROOKE, R G, M R C S, for Droitwich Worcestershire,
CAUSLEY, G W, M B LPOOL, F R C S for St Blazey, Cornwall,
HAYES, R M, M B EDIN Pitlochry Perthshire, and
CAMPS, P W L, M B LOND, F R C S, Teddington, Middlesex

Births, Marriages and Deaths

BIRTHS

HARRIS—On March 22, at Windsor, the wife of Dr Cyril Harris—a daughter

HERBERT BURNS—On March 26 at Alvechurch, Worcs the wife of Surgeon Lieutenant Jack Herbert Burns R N V R—a daughter

HYSLOP—On March 25, at Settle, the wife of Dr D B Hyslop—a daughter

JONES—On March 22, the wife of Dr Ronald Jones, of Ipswich—a daughter

MARRIAGES

RAE—WARREN—On March 20, at Cranleigh James Wright Rae, M B, surgeon lieutenant, R N V R, to Joan Lydia Warren, Q A R N N S (R)

DEATHS

ADDISON—On March 24, at Bury St Edmunds, Kate Addison, M B, wife of the late Oswald Addison, F R C S

CAMPBELL—On March 26, at Edinburgh, Robert Brown Campbell, M D EDIN, F R C P E

DE SOUZA—On March 25, in London, David Henriques de Souza, M D, D SC LOND, F R C P barrister at law aged 65

GARDNER—On March 24 at Rottingdean Thomas Hudson Gardner, M B formerly of Streatham Hill S W aged 67

LEEPER—On March 25 Richard Robert Leeper F R C S I, medical superintendent of St Patrick's Hospital Dublin

MARJORIBANKS—On March 25 in Edinburgh, James Leslie Marjoribanks M D EDIN D P H lieut colonel I M S retd

MARKS—On March 23 Robert John Marks, lieut colonel M R C S, I M S, retd, aged 79

TODD—On March 15, Andrew William Palethorpe Todd M C, M B DUBL, major R A M C activity The swing of the pendulum however seems in excess of even such a restoration of function Wasting through disuse, as we have seen, offers but a partial explanation for the loss Some reflex trophic effect may possibly be in operation, such as is found in the muscular wasting associated with bone or joint disease Harding (1925, 1926 and 1929), extending the observations of others, has shown that such an atrophy, which is mainly reflex in character, depends on the integrity of the afferent paths and is accompanied by an increased consumption of oxygen Such a theory demands an exhaustion of the muscle by an excessive number of abnormal stimuli This reflex wasting of muscle is undoubtedly responsible, in part, for the increased tissue katabolism which we have observed during the convalescence of certain patients who had their knee-joints incised It is questionable, however, if this type of " sympathetic " wasting is the main cause of the greatly increased protein katabolism after injury

Reflex wasting would presumably apply solely to the limb affected and not to the body generally If, then, the evidence suggested that the excess excretion of katabolites could not be accounted for by the local changes a more general explanation had to be sought A few of the experiments performed to this date had indicated the necessity for some explanation based on both local and general changes A study of the nitrogen metabolism of several cases of pneumonia, before and after the crisis, had failed to reveal katabolic effects in excess of those noted in these severe injuries of bone and joint, so that fever did not in itself seem to be the potent factor At this stage it was necessary to seek information from experiments on lower animals, since the answer could not be derived satisfactorily from human cases Recourse was made to experiments on the rat (Cuthbertson, McGirr and Robertson 1939)

The metabolism of nitrogen, phosphorus, potassium, sodium, creatine and creatinine were studied, as well as the change in weight of the muscle groups affected, after fracture of the femur by open operation and without splinting It was found that the osteotomy was followed by a well marked disturbance of general as well as local metabolism, and this was again evidenced by a well marked loss of nitrogen, phosphorus and potassium and with some increased creatinuria Sodium and creatinine remained relatively unaltered, occasionally a slight fall was noted These products as a rule reached their maximum elimination about the 3rd or 4th day in the rat, slightly earlier than they did in man, although the findings in man had exhibited considerable variation There was often a small rise in the excretion of these variable katabolites several days later Following the peak of the metabolic disturbance the various processes declined in intensity, paralleling the changes seen in man

The excessive loss of potassium was probably the result of cell injury and changes in cell permeability There was evidence to show that the muscles adjacent to the fracture lost relatively more potassium than nitrogen The loss of potassium was indeed apparently far greater than could be accounted for by local changes Excessive creatinuria is probably related to processes taking place in the muscles of the injured limb

This differential behaviour leads us to inquire how far it is justifiable to assume that the loss in weight is actually due to a complete disintegration of a small fraction of the muscle cells, accompanied by a partial but parallel loss of a portion of the constituents of a large number of cells Potassium is spent more freely than nitrogen, creatine compared with these losses is preferentially retained, and the existent creatinuria may in greater part be accounted for by the local tissue loss Nitrogen and potassium cannot therefore arise from a parallel loss of lesser or greater portions of the body's cells It is interesting to remember that Andreesen and Tammann (1933) found that there was a rise in the potassium and calcium content of the tissue fluids of aseptic wounds Sodium and chlorine were diminished During the hyperæmia, which is one of the cardinal signs of the reaction to injury and which constitutes a phase of the healing process, there is this early increase in the permeability of the cells of the inflamed tissue (Schmidtmann and Malthes 1927) This presumably causes a loss of potassium from the cytoplasm Potassium injected into a wound does appear to promote hyperæmia (Schück 1926, Häbler and Hummel 1928) and causes pain lasting up to an hour after the injection.

From weighing the limbs and muscle groups involved it was obvious that the wastage of body substance could not be fully accounted for by the loss of muscle substance from the site of injury or indeed from the injured limb There appears to be, in addition to reflex wasting and autolysis, a generalised increase in katabolism to meet the exigencies of the enhanced metabolism of the recuperative process If it is taken for granted that the excess nitrogen comes from muscle, then the loss of muscle substance can account for four-fifths of the total loss of body-weight The presumption is that in addition the reserves of carbohydrates and fat are also called on to meet the demand for readily oxidisable material

EFFECT OF DIET AND PITUITARY EXTRACT

A few experiments were made to determine how far this loss of tissue substance, as indicated by increased excretion of certain katabolites, could be spared by the ingestion of additional food, in particular carbohydrate It was hardly to be expected that the natural reparative processes could be materially influenced by dietary means but this could not be assumed with certainty until proof was forthcoming Morgan's early experiments (1906) on salamanders demonstrated that the influence of diet on the regeneration of tissues can only be of secondary importance, for salamanders receiving no food regenerate their amputated limbs just as rapidly as do well-fed animals Howes and others (1933) found, too, that the rate of healing of stomach wounds of adult rats was not noticeably affected by complete starvation or by a half-adequate diet The healing rate in young rats was, however, affected

Difficulties were encountered in applying this type of experiments, for the animals were readily put off their basic diet, which had to be kept slightly below the optimal level in order to allow the animal to continue on a constant intake throughout the whole preoperative and postoperative period It was found impossible to make the animals eat more food during the first few days after the operation Later, evidence was obtained that additional carbohydrate exercised a definite sparing effect on the general loss of tissue substance, although it did not appreciably affect the local tissue wastage Further experiments were necessary and obviously they were this time applicable to the human being

Patients with fractures of the femur or of the bones of the legs due to direct violence were selected (Cuthbertson 1936) and within a day or two after trauma they were given diets rich in protein, calories or both It was found that these diets considerably modified the urinary losses Diets rich in first-class protein and containing the maximum number of calories which the patient could consume (as much as 230 g protein were consumed daily by one patient and 4100 calories by another) failed to eliminate a negative nitrogen balance at the height of the katabolic process There occurred first a period of retention of nitrogen while the nitrogen excretion was rising, then a period of loss, to be followed later by another period of retention The failure to attain nitrogen equilibrium at the height of katabolism in our cases is the more extraordinary since there was relatively little, if any, disturbance of body temperature, and since we found that when excess food is given to a normal uninjured person a well-marked retention of nitrogen and sulphur takes place, temporarily at least (Cuthbertson, McCutcheon and Munro 1937, Cuthbertson and Munro 1937) In some of our injuries caused by indirect violence, where there was not the same extent of soft tissue damage, nitrogen retention was observed on surplus diets

In passing it should be noted that in wound healing experiments Clark (1919) found that a high protein diet eliminated the quiescent period which precedes construction and epithelialisation, whereas a high fat diet lengthened this period to six days and carbohydrate and mixed diets gave intermediate values Thompson, Ravdin and Frank (1938) have shown that the hypoproteinæmic dog is frequently incapable of normal fibroplasia, and more recently Rhoads, Fliegelman and Panzer (1942) have made the interesting observation that this fibroplasia can occur if the dog is given ample amounts of acacia intravenously to maintain the colloid to an increase in the plasma potassium, is restrained by the addition of glucose to the blood (Harris 1941)

THE FLOW PERIOD

After the period of lowered metabolic activity or "ebb," which we have termed shock and which is initiated by the actual trauma to the cells, direct or indirect, the metabolic activity rises with the onset of what may be termed traumatic inflammation This process precedes actual repair and is characterised by hyperæmia, exudation, leucocytic emigration and so on, it may be considered to constitute the "flow" As has already been noted, the diminished and altered metabolism attendant on this tissue injury is held to play a part in stimulating the repair process, and Carrel and Baker (1926) have found that the higher cleavage products of certain proteins act in stimulating cell proliferation Autolysis and heterolysis through tissue and leucocytic enzymes respectively remove the tissue debris, and sloughs which are not absorbed may separate

My own interest in this aspect of healing developed from a study of the metabolism of calcium and phosphorus in fracture cases, due to my discovery that there was a large discrepancy between the metabolism of these two elements. Whereas the intake and output of calcium showed only minor differences there was a definite loss of phosphorus from the body. This immediately raised the question of the behaviour of nitrogen and sulphur, for the soft tissues seemed to be intimately concerned (Cuthbertson 1930) Evidence of a well-marked loss of nitrogen, sulphur and phosphorus came to light, and it was resolved to determine to what extent disuse atrophy following splinting might play a part in promoting this loss Metabolic studies (Cuthbertson 1929) in normal subjects revealed an undoubted but small increase in the output of nitrogen, sulphur and phosphorus and to lesser degree of calcium, the rise in the excretion of nitrogen and sulphur being due to increases in the urea and inorganic sulphate output There was also evidence of a reduction in the volume of the muscles of the legs and a definite but small general reduction in oxygen intake during the period of splintage Since these changes were slight compared to those noted in the fracture cases a study of the latter in fuller detail, and with as little delay as possible after their admission to hospital, was resumed

It was found that after injury there might be either a relative or absolute anuria, occasionally lasting for 24 hours, while in other cases there was little apparent disturbance of urine formation After the period of depressed metabolism the output slowly and often irregularly rose The maximum volume was usually not attained until about two days after the maximum excretion of nitrogen had appeared The earliest specimens of urine available indicated the presence of relatively normal amounts of nitrogen, sulphur and phosphorus but these values soon rose, rapidly reaching in the case of nitrogen a value sometimes two or three times the intake The maximum daily loss might rise as high as 23 g of nitrogen, this maximum excretion being reached as a rule between the 4th and 8th days following bony or non bony injury In the group of postoperative cases (osteotomies, &c) this peak value was reached rather earlier, usually on the 2nd to 4th day The maximum output of sulphur coincided in time or occurred on the day following that of nitrogen A study of the sulphur to nitrogen ratio of the total excess outputs indicated that the substance being katabolised was apparently in the main muscle, and this conclusion was in general supported by the phosphorus to nitrogen ratio The maximum daily loss was fairly proportional to the total loss whether estimated over 5 or over 10 days The total loss during 10 days might even reach as high a value as 137 g of nitrogen in the case of a fracture of both bones of the leg—with a resulting reduction in the nitrogen content of the body amounting to 7 7%

An attempt was made at this stage to determine if the extent of the nitrogen loss could be correlated with the degree of tissue damage The evidence indicated that there were certainly grounds for considering that they were related, but it was found that an injury such as the dislocation of an ankle might produce as great a disturbance of metabolism as the splintering of both bones of a leg (Cuthbertson 1932) It may be of course that an error was made in our conception of the extent of the damage done I well remember a conversation with Mr Wilfred Trotter in which he lamented the fact that we had no real criterion of the degree of trauma in cases of injury He urged me to *try and determine* if some biochemical principle might serve as a clue

This metabolic upset which I have described was quite independent of the anæsthetics used in the manipulation of some of the cases of injury Indeed, osteotomy cases showed less metabolic disturbance than did accident cases, probably because they were adequately splinted from the start, suffered less pain, and the injury to soft tissues was almost certainly less

A search for accounts of experiences similar to ours revealed a few related records In 1904 Hawk and Gies confirmed the observations of Bauer (1872) and Jürgensen (1885) that hæmorrhage caused an increased elimination of nitrogen, and demonstrated that even the operation of venesection without "blood letting" is sufficient to cause an appreciable though slight increase in the output of nitrogen and sulphur in the dog During the later years of the last war, Wertheimer, Fabre and Clogne (1919) noted that after the period of shock the amount of ammonia and urea excreted remained at a high level for some time and might even amount to 37 g urea per day Waugh (1941) has shown that there is an excessive excretion of urea in cases of bone and joint suppuration

In most but not all of my cases of injury I found that there was a rise in body temperature resulting from the injury The general trend of the curve was parallel to that of the urinary excretion of nitrogen but preceded it With few exceptions the rise never exceeded 3 5° F The pulse-rate tended sometimes to lag behind the rise in temperature, but in other experiments there was an almost perfect correlation In certain cases with pronounced quantitative alterations in the urinary products little or no change in either *pulse-rate or temperature* was detected

These observations agree with those of Malcolm (1893), who noted that there might be evidence of increased nitrogen metabolism after a major operation although the temperature remained low The basal consumption of oxygen in my experiments usually rose *parallel to the* increased excretion of nitrogen The fluctuations either coincided in time or preceded those of nitrogen by 24–48 hours when they tended to coincide with the rise in body temperature The average increase was in the neighbourhood of 20–25%, which *is in keeping* with van't Hoff's law when correlated with the temperature rise.

After the attainment of these maximum values, all these metabolic disturbances declined, particularly the body temperature and pulse-rate The oxygen consumption in our experiments was not followed for a sufficiently long period to decide what its ultimate level might be There was certainly evidence that even after six weeks there might still be a small but definite loss of nitrogen

A study of the protein fractions of the blood-plasma by precipitation methods revealed *a well-marked* rise in the globulin moiety, which appeared to be increased by further trauma, and a slight lowering of the albumin fraction The fibrinogen fraction was often appreciably raised When the ultracentrifuge is applied to the investigation of these changes a truer measure of their significance may be forthcoming On the whole there was not much retention of non-protein nitrogen (Cuthbertson and Tompsett 1935) Oswald (1910) many years ago showed that the permeability of membranes to albumin is greater than to globulin and their permeability to globulin is greater than to fibrinogen We have already noted that with an inflammatory reaction there occurs swelling *of* the capillary wall with increase in permeability These changes in the level of the plasma proteins after trauma may therefore be related to differences in permeability

SEARCH FOR THE EXPLANATION

These metabolic experiments, while providing evidence of a well-marked tissue katabolism failed to provide any explanation or to indicate how widespread was the reaction *From its extent* and from the S N ratio of the material involved, muscle was regarded as probably the main source of these katabolites The question naturally arose as to what disturbance of muscular metabolism would lead to such an enormous and early loss of substance

Part of this reaction is probably due to the enhanced metabolism which follows the initial phase of depressed

INTRAPERITONEAL SULPHANILAMIDE

ITS PROPHYLACTIC AND THERAPEUTIC VALUE

RUPERT VAUGHAN HUDSON
F R C S
SURGEON TO MIDDLESEX HOSPITAL

RODNEY SMITH
M S LOND F R C S
LATELY SURGICAL REGISTRAR AT THE HOSPITAL

IN April, 1941 we published an account of animal experiments demonstrating the good effects of sulphanilamide implanted in the peritoneal cavity in preventing peritonitis when the peritoneum had been grossly contaminated The use. both prophylactically and therapeutically, of this form of chemotherapy on clinical cases was advocated and we described the first six cases treated in this way, the results of which were sufficiently encouraging to convince us that the treatment was of value and should be continued The results obtained since then seem conclusive enough to warrant the publication of a comparatively small series of cases

Although since 1938 we had applied sulphanilamide powder locally to wounds and surgical incisions at various sites, it was not until October, 1940, that we began to instil the drug into the peritoneal cavity We propose to compare the results obtained in cases treated from the start of the war up to October 1940 which we will call the first series, with those in a second series from October, 1940, to October 1941 In many cases in our first series sulphanilamide or sulphapyridine was administered by mouth, intravenously or intramuscularly and it was because the results were so disappointing that we began the animal experiments in the hope of finding a more efficacious form of chemotherapy Apart from chemotherapy, there is no difference in the technique adopted in the two series, with one exception In both, gastric or duodenal suction was adopted in cases of intestinal obstruction whether mechanical or paralytic associated with peritonitis, but there is little doubt that the technique of suction drainage employed in our later cases was more efficient than that used earlier for although there was no difference in the actual intubation. a Ryle s tube being used throughout by 1941 we had evolved a standardised method of application which combined the best points of the various techniques we had investigated in 1939 and 1940 Nevertheless, while suction drainage effectively applied is undoubtedly of great value in any case of intestinal obstruction, yet we do not feel that the difference in technique can explain the drop in our fatality-rate We must conclude that this drop is connected with the adoption of intraperitoneal sulphanilamide as a routine prophylactic or therapeutic agent

We may consider first those cases of abdominal section in which there was a definite risk of severe peritonitis though not a great risk—e g perforated peptic ulcer. acute appendicitis with local peritonitis appendix abscess, colostomy ileostomy acute pancreatitis operations on the biliary tract salpingitis and acute intestinal obstruction excluding cases of resection of gut In our first series 85 such cases were dealt with 9 dying a fatality of 10 6% In our second series the figures were 101 cases with 6 deaths a fatality of just under 6%

A second group of cases consisted of those in which the patient appeared to be in great danger of death from peritonitis It included cases of grave general peritonitis present before operation resection of strangulated gangrenous gut resection of gut in the presence of intestinal obstruction and perforations of the gut with gross contamination of the peritoneum, for example perforated diverticulitis In our first series 18 such cases were treated, 10 dying a fatality of 55 5% The corresponding figures for our second series were 24 cases with 2 deaths a fatality of 8 3% Of the 2 fatal cases death was due in one to peritonitis in a case admitted 5 days after a perforation of a gastric ulcer, and in the other to general peritonitis caused 10 days after operation by sloughing of one loop of a Paul s colostomy because of an inadequate blood-supply This comparison of fatality-rates is summarised in the table

RESULTS IN COMPARABLE CASES BEFORE AND AFTER THE ROUTINE ADOPTION OF INTRAPERITONEAL CHEMOTHERAPY

—	Group 1			Group 2			Total		
	Localised peritonitis or slight peritoneal contamination			Grave general peritonitis or gross peritoneal contamination			All cases of peritonitis or peritoneal contamination		
	C	D	F (%)	C	D	F (%)	C	D	F (%)
1939–40	85	9	10 6	18	10	55 5	103	19	18 4
1940–41	101	6	5 9	24	2	8 3	125	8	6 4

C = cases , D = deaths F = fatality-rate

One other comparison can be made From September 1939 to October 1940, we had 11 deaths from general peritonitis in 143 cases of abdominal section Since then in 161 cases we have had the two deaths from general peritonitis mentioned above

METHOD OF APPLICATION

In all our cases sulphanilamide has been the only chemical placed in the peritoneal cavity The recent experiments of Throckmorton (1941) however suggest that sulphathiazole may prove to be slightly more effective, though just as innocuous to the peritoneum itself

---

DR CUTHBERTSON REFERENCES

Allen F M (1939) *Surg Gynec Obstet* 68 1047
Andreesen R and Tammann H (1933) quoted by Arey
Arey, L B (1936) *Physiol Rev* 16 327
Aub, J C (1920) *Amer J Physiol* 54 388
— Wu H (1920) *Ibid* p 416
Bauer J (1872) *Z Biol* 8 567
Carrel A (1921) *J exp Med* 34 425 (1930) quoted by Arey
— Baker L E (1926) *J exp Med* 44 503
Clark A H (1919) *Bull Johns Hopk Hosp* 30 117
Cuthbertson D P (1929) *Biochem J* 23 1328 (1930) *Ibid* 24 1244 (1932) *Quart J Med* 1, 233 (1936) *Brit J Surg* 23 505
— McCutcheon A and Munro H N (1937) *Biochem J* 31, 681
— and Munro H N (1937) *Ibid*, 31 694
— McGirr J L and Robertson J S M (1939) *Quart J exp Physiol* 29 13
— Shaw G B and Young F G (1941a) *J Endocrinol* 2 468 (1941b) *Ibid* p 475
— and Tompsett S L (1935) *Brit J exp Path* 16 471
— Webster T A and Young F G (1941) *J Endocrinol* 2 459
Davis H A (1936) *Proc. Soc exp Biol N Y* 34 21
Declaise (1834) quoted by Mann F C (1914) *Bull Johns Hopk Hosp* 25 205
Freeman N E Shaffer S A Schecter A E and Holling H E (1938) *J clin Invest* 17 359
Gesell R Blair E and Trotter P T (1922) *Amer J Physiol* 61 399
Grant R T and Reeve E B (1941) *Brit med. J* i 293 and 329
Habler C and Hummel P (1928) *Klin Wschr* 7 2151
Harding A B (1925) *J Path Bact* 28 179 (1926) *Ibid* 29 [illegible] (1929) *Lancet* i 236
Harkins H N (1935) *Arch Surg* 31 71 (1941) *Surgery* 9 1
Harris J F (1941) *J biol Chem* 141 579
Hawk P B and Gies W J (1904) *Amer J Physiol* 11 171
Henderson Y Prince A L and Haggard H W (1917) *J Amer med Ass* 69 965
Holmes [illegible] L Briggs H [illegible] P and Harvey [illegible] (1933) *Arch* [illegible] 46
Hunt, A H (1941) *Brit J Surg* 28 436
Hunter, J (1794) A Treatise on the Blood, Inflammation and Gunshot Wounds London
Jürgensen (1885) quoted by Hawk and Gies
Landis E M (1928) *Amer J Physiol* 83, 428
Lanman T H and Ingalls T H (1937) *Ann Surg* 105 616
Lund C C and Crandon J H (1941) *J Amer med Ass* 116 663
McDowall R J S (1940) *Brit med J* i 919
Malcolm J D (1893) The Physiology of Death from Traumatic Fever Edinburgh
Meltzer S J (1908) *Arch intern Med* i 571
Menkin V (1939) *Proc Soc exp Biol N Y* 40, 103 (1940) *Ibid* 44 588
Morgan T H (1906) *J exp Zool* 3 457
Oswald A (1910) *Z exp Path Ther* 8 226
Piéchaud (1880) quoted by Quénu E (1918) *Rev Chir , Paris*, 56, 204
Price P B Hanlon C R Longmire W P and Metcalf W (1941) *Bull Johns Hopk Hosp* 69 327
Quastel J H and Racker E (1941) *Brit J exp Path* 22 15
Rhoads J E Fliegelman M T and Panzer L M (1942) *J Amer med Ass* 118 21
Roche A (1933) *C R Soc Biol Paris* 114 1027 (1934) *Skand Arch Physiol* 69 75
Saitta S (1929) quoted by Taffel and Harvey
Schmidtmann M and Mathes K (1927) *Z ges exp Med* 57, 127
Schück F (1926) *Klin Wschr* 5 2014
Scudder J (1940) National Research Council Bulletin on Shock
Taffel M and Harvey S C (1938) *Proc Soc exp Biol N Y* 38 519
Tammann Blümel P and Popp P (1933) *Arch klin Chir* 172 81
Thomson W D Pardin I S and Frank I L (1938) *Arch Surg* 36 [illegible]0
Waugh W (1941) *Brit med J* ii 236
Wertheimer Fabre and Clogne (1919) quoted from *Spec Rep Ser med Res Coun Lond* No 26
Young J S Fisher J A and Young M (1941) *J Path Bact* 52, 22[illegible]

osmotic pressure of the plasma Acacia solution is not recommended for hypoproteinæmia in patients

Conditions which undermine the general nutrition, such as prolonged vitamin deficiency and particularly lack of vitamin C, also retard wound healing There is a considerable though not unanimous body of experimental evidence in support of this thesis (Saitta 1929, Lanman and Ingalls 1937, Taffel and Harvey 1938, Hunt 1941 and others) Crandon's experiment (Lund and Crandon 1941) on himself suggested that a very prolonged deprivation of vitamin C (six months) is necessary in the healthy subjects before effects on intercellular substance and collagen formation affect wound healing It is obvious that patients with peptic ulcer on an ill-balanced diet might exhibit such a deficiency in wound healing

In the course of an investigation into the action of a crude extract of anterior pituitary tissue of the ox we noticed that the extract had definite nitrogen-retaining properties when injected into the rat (Cuthbertson, Webster and Young 1941) Experiments showed that this particular extract, when injected daily into rats suffering from a fractured femur, produced by open operation, prevented the loss in body-weight and excessive loss of nitrogen and creatine which were the usual concomitants of such an injury The effect of the extract on the metabolism of the injured animal was general rather than local, and possibly represented the normal growth response to this extract, superimposed on and thereby masking the increased katabolism following injury Observations of the rate at which the atrophied muscles were restored under the influence of the pituitary extract showed that, although the animal as a whole grew more rapidly under the pituitary stimulus and the total protein katabolism was in general covered by a protein anabolism, no greater rate of restitution of the atrophied muscles of the injured limb was thus induced In other words, the promotion of a general protein anabolism provided no special stimulus for the restoration of the muscles of the injured limb Further, the *extract had no significant effect on the total time required* to heal superficial wounds (Cuthbertson, Shaw and Young 1941a and b)

This experiment demonstrated that the rate of wound healing was not significantly accelerated by a substance which induced an acceleration of general growth—that is, local anabolism was not affected by general anabolism Could it be that a general katabolism might influence local anabolism ? Preliminary observations, made with the assistance of Dr T H C Barclay and Mr Alick Isaacs, have shown that the feeding of dried thyroid accelerates the rate of wound healing

Earlier we suggested that the increased katabolism which we have noted may intimately be concerned in the healing process. Carrel (1921) considered that "slight infection" of an experimental wound by staphylococci in bouillon or "irritation by such substances as turpentine and chick embryo *extracts shortens* the latent period of healing of experimental wounds in the dog (to less than two days) as compared with a "non-irritating antiseptic dressing" Young, Fisher and Young (1941) have deduced from their experiments that some accelerating factor must operate in the closure (or healing) of a secondary wound which is lacking in primary wounds, but the nature of this factor has not been determined, whether it be a "growth-promoting substance" liberated by the primary wounds, a by-product of immunity, or some other principle They too concluded that healing cannot be exclusively a local phenomenon but must depend to some extent on general or *constitutional factors*

* * *

It may be said that injury to an animal leads to lessened activity, and lessened activity reduces its capacity to find food The necessity for reparation is urgent and the body may require and may prefer to katabolise its reserves to meet the exigencies of the moment The work of Mme Roche on the "plasticity" of the protein molecule lends support to the view that considerable alteration in the complexity of the protein molecules may take place without degeneration of the cell (Roche 1933, 1934) Truly "protein contains the magic of life "- In its ebb and flow, its katabolism and anabolism we shall find a clue to the reactions to injury which control the disposition and the means of cure

SUMMARY

The physiological response to trauma, in particular its metabolic component, exhibits a complex picture The period of shock, characterised essentially by depressed cellular metabolism, is initiated by the actual trauma to the cells, direct or indirect After this the metabolic rate rises with the onset of traumatic inflammation The diminished and altered metabolism attendant on the tissue damage plays a part in stimulating the repair process

Patients with moderate or severe physical injury—e g, fracture of a long bone—frequently showed a relative or absolute anuria of varying duration during the first 24 hours The urinary volume then slowly and often irregularly rose The earliest specimens exhibited normal amounts of nitrogen, sulphur and phosphorus but these values soon rose, and the daily loss of nitrogen might exceed 23 g As a rule the maximum excretion of nitrogen was reached between the 4th and 8th day after bony or non-bony injury, in a group of postoperative cases (osteotomies, &c) the peak was reached rather earlier

The nitrogen sulphur and nitrogen phosphorus ratio of the total excess outputs suggested that the substance katabolised was mainly muscle protein

The metabolic upset could not be explained on the basis of a disuse atrophy, although this undoubtedly accounted for a loss of nitrogen, sulphur and phosphorus in the urine, nor was it due to the use of anæsthetics

Usually, though not always, the injury produced a rise in body temperature The general trend of the temperature curve was parallel to that of the urinary nitrogen but preceded it in time The rise rarely exceeded 3 5° F The pulse-rate curve sometimes lagged behind the temperature but in other experiments there was almost perfect correlation The basal oxygen consumption usually rose parallel to the increase in *nitrogen excretion*

After attaining maximal values all the metabolic disturbances declined, but even after six weeks there might be a small but definite loss of nitrogen

A study of the protein fractions of the blood-plasma by precipitation methods revealed a rise in globulin, which appeared to be increased by further trauma, and a slight lowering of the albumin fraction The fibrinogen fraction was often appreciably raised On the whole there was not much retention of nitrogen

After fracture of a femur by open operation and without splinting rats showed a well-marked disturbance of general as well as local metabolism, evidenced by loss in the urine of nitrogen, phosphorus and potassium and increased creatinuria Sodium and preformed creatinine remained relatively unaltered or occasionally fell slightly

The wastage of body substance after injury could not *be fully accounted for by the* loss of muscle substance from the site of injury or indeed from the injured limb In addition to the reflex wasting and autolysis, there appears to be a general increase in katabolism, of protein in particular, to meet the enhanced metabolism of the repair process

Diets rich in first-class protein, and containing the maximum of calories which the patient could consume, failed to eliminate negative nitrogen balance at the height of the katabolic process in many cases *of fracture* due to direct violence In some cases of injury due to indirect violence, where there was not so much tissue damage, nitrogen retention was observed on surplus *diets*

A crude extract of the anterior pituitary gland of the ox, with well-marked nitrogen-retaining properties, was injected into rats with a fractured femur Although the animals as a whole grew more rapidly, and the total protein katabolism was in general covered by a protein anabolism, restitution of the muscles was not accelerated The extract also had no significant effect on the total period required to heal superficial wounds

In injured animals fed on dried thyroid gland the healing of surface wounds was accelerated, suggesting that an enhanced metabolism might influence local anabolism

References at foot of opposite page

extreme retroperitoneal digestion Postoperatively this was treated by continuous nasoduodenal suction for 9 days The patient made a good recovery

The postoperative concentration of sulphanilamide in the blood is shown in fig 2, curve 1

CASE 5 —A woman of 40, admitted with general peritonitis of unknown ætiology of 3 days' duration She was very ill and dehydrated, with extreme generalised abdominal rigidity, a pulse rate of 140, and profuse effortless vomiting of dark brown intestinal contents Warmth, morphia, gastric suction and an intravenous drip saline preceded laparotomy (R S) under local field block and light cyclopropane anæsthesia, which revealed a gangrenous appendix and general peritonitis Appendicectomy was followed by the insertion of 15 g of sulphanilamide and drainage of the peritoneal cavity Postoperative continuous gastric suction contributed to a satisfactory convalescence, complicated only by a *Bact coli* cystitis A swab taken at operation from the peritoneal fluid had failed to demonstrate this organism, cultures proving sterile though the direct smear showed numerous polymorphs

In this case intraperitoneal sulphanilamide was supplemented by 1 g of sulphapyridine intramuscularly 6 hourly for 48 hours, starting 12 hours after operation The resulting concentration in the blood is shown in fig 1, curve 3

CASE 6 —A woman of 25, operated on (R S) for general peritonitis and gangrenous appendicitis On opening the abdomen purulent fluid poured out from a peritoneal cavity devoid of any trace of localising adhesions A swab gave a culture of *Bact coli* and *Streptococcus fæcalis* Treated by appendicectomy, 10 g of intraperitoneal sulphanilamide and postoperative continuous gastric suction, she made a good recovery

The postoperative concentration of sulphanilamide in the blood is shown in fig 2, curve 2

CASE 7 —A very obese bronchitic woman of 45 was under treatment in the hospital for a varicose ulcer when she was seized suddenly with severe generalised abdominal pain with diffuse rigidity and tenderness Physical signs suggesting consolidation at both bases and a respiration rate of 35 made one wonder whether the abdominal pain and rigidity were referred from the thorax but a plain radiogram showed gas under the diaphragm Laparotomy (R S) under local field block and light cyclopropane anæsthesia revealed a perforated diverticulitis with free fæces in the peritoneum Suture of omentum over the perforation was followed by transverse colostomy and the implantation of 15 g of sulphanilamide into the peritoneal cavity, which was drained by strips of corrugated rubber Postoperatively her chest gave rise to anxiety for some days, but apart from this convalescence was uneventful

CASE 8 —A man of 43, admitted with very severe generalised abdominal pain and such extreme rigidity that his doctor had sent him into hospital with a diagnosis of perforated gastric ulcer The key to the diagnosis was the character of the pain, which had begun gradually 24 hours previously as a diffuse ache, had then become localised to the right iliac fossa and abated somewhat, and had finally become generalised again abruptly and with great severity 4 hours before admission At operation (R S) large quantities of liquid intestinal contents poured out of the abdomen A gangrenous perforated area about the size of a sixpence was found at the base of the appendix, amounting in fact to a perforation into the cæcum The appendix was removed and the peritoneal cavity drained after the implantation of 15 g of sulphanilamide Postoperatively continuous gastric suction contributed to a rapid recovery

CASE 9 —A man of 69, operated on (R S) for strangulated right femoral hernia ten years after a bilateral repair of inguinal herniæ had been performed elsewhere Strangulation had apparently occurred only 12 hours before operation, but the loop of ileum concerned was gangrenous and perforated Resection was followed by end-to end anastomosis, the whole operation being performed through an inguinal incision The line of anastomosis was then powdered with sulphanilamide and a suspension of sulphanilamide in saline was injected into the general peritoneal cavity, 15 g being used in all Closure of the incision and a Lotheisen repair was carried out without drainage Recovery was rapid and uneventful

CASE 10 —A man of 41 consulted his doctor with an increasing chronic obstruction in the ileo-cæcal region He was given a barium enema and a barium meal which completely blocked what little lumen remained at the site of obstruction and he was admitted to the Middlesex Hospital, acutely obstructed, vomiting barium and full of barium from mouth to anus Preliminary decompression by continuous gastric suction preceded an exploratory laparotomy (R V H), which revealed a ring carcinoma at the beginning of the ascending colon A hemicolectomy was performed, followed by anastomosis of the ileum to the transverse colon Intraperitoneal sulphanilamide and continuous postoperative gastric suction contributed to a smooth and rapid convalescence

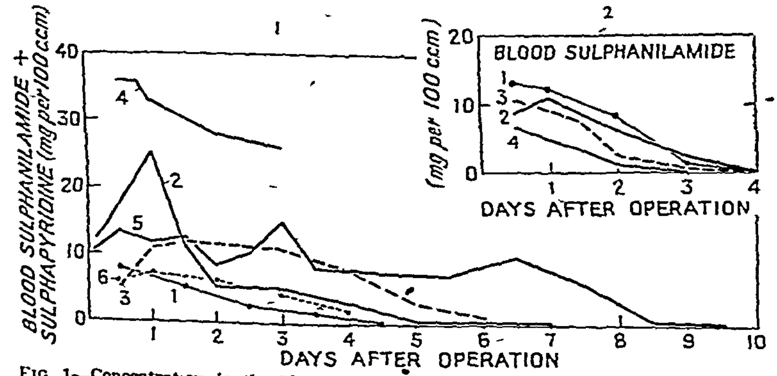


FIG 1—Concentration in the blood of sulphanilamide plus sulphapyridine in cases where intraperitoneal sulphanilamide and postoperative sulphapyridine have been used

Curve 1—Resection of growth involving large and small gut in presence of acute intestinal obstruction (case 1) 15 g of intraperitoneal sulphanilamide followed after 12 hours by 1 g of sulphapyridine intramuscularly 6 hourly for 48 hours

Curve 2—Resection of fistula of small gut (case 2) 10 g of intraperitoneal sulphanilamide followed after 12 hours by 1 g of sulphapyridine intramuscularly 6 hourly for 3 days

Curve 3—Gross general peritonitis (case 5) 15 g of sulphanilamide followed after 12 hours by 1 g of sulphapyridine intramuscularly 6 hourly for 48 hours

Curve 4—Gross general peritonitis 20 g of intraperitoneal sulphanilamide followed after 12 hours by 1 g of sulphapyridine intramuscularly 4 hourly for 48 hours

Curve 5—Resection of strangulated gangrenous gut 15 g of intraperitoneal sulphanilamide followed after 24 hours by 1 g of sulphapyridine intramuscularly 6 hourly for 6 days

Curve 6—Gross general peritonitis in girl of 16 years 5 g of intraperitoneal sulphanilamide, followed after 24 hours by further 5 g intraperitoneally through rubber tube and similar dose after 36 hours Thereafter 1 g of sulphapyridine given intramuscularly 6 hourly for 36 hours

FIG 2—Concentration in the blood of sulphanilamide after intraperitoneal sulphanilamide only

Curve 1—Acute pancreatitis (case 4) 10 g of intraperitoneal sulphanilamide

Curve 2—Gross general peritonitis (case 6), 10 g of intraperitoneal sulphanilamide

Curve 3—Perforated gastric ulcer 15 g of intraperitoneal sulphanilamide

Curve 4—Acute appendicitis with local peritonitis 10 g of intraperitoneal sulphanilamide

Other figures for the concentration of sulphanilamide in the blood after intraperitoneal sulphanilamide have already been published (Hudson Smith and Noble 1941)

DISCUSSION

Intraperitoneal sulphanilamide seems to us to have proved an extremely valuable weapon in the treatment of potential or established peritonitis Yet however effective this detail in the treatment of peritoneal infection may be the best results will only be obtained by combining it with careful attention to preoperative preparation operative technique choice of anæsthetic, and postoperative care The importance for instance of continuous suction drainage of the small gut by means of a gastric duodenal or intestinal tube in cases of intestinal obstruction can hardly be overestimated Apart from the question of peritonitis it seems a reasonable assumption that the production of a high concentration of sulphanilamide in the blood-stream soon after operation should reduce the incidence of postoperative pneumonia and urinary infections It has been a disappointment that the high dosage used in our series has not always prevented these complications

The value of postoperative reinforcement of intraperitoneal chemotherapy

Further experimental work is necessary before it can be assumed that it is safe to use sulphapyridine in the peritoneal cavity in clinical cases In cases of grave general peritonitis we use 15–20 g of sulphanilamide suspended in 60–70 c cm of saline and try to distribute this evenly over the peritoneum, this is not easy but can be accomplished satisfactorily if the following points are attended to

When the surgeon is ready to sew up, the peritoneum should be sutured with a length of fine rubber tubing leading into the peritoneal cavity This tubing should be of such a bore that it fits firmly on the nozzle of a 20 c cm record syringe The sulphanilamide powder should now be placed in a small gallipot and covered with 60–70 c cm of saline and immediately stirred vigorously until a fine uniform suspension is obtained Without delay, this suspension is injected with a record syringe through the rubber tube, which is then removed

Suture of the peritoneum before injecting the suspension prevents some of the sulphanilamide leaking out while the surgeon is sewing up Rapid stirring and injection of the powder is necessary because sulphanilamide, if covered with saline and left, settles into lumps which will not be taken up by the syringe, and which if inserted into the peritoneal cavity would not give the desired uniform distribution In cases with an obvious focus of infection, such as a gangrenous appendix, this is dealt with according to established surgical principles, and the site is especially powdered with finely divided sulphanilamide Drainage of the peritoneum is employed in these cases

In cases of severe contamination of the peritoneum occurring in perforations of gut, gangrene from strangulation and so on, a suspension of 10–15 g is used and danger points, such as a line of anastomosis, are powdered carefully In cases where general peritonitis is considered possible but unlikely, such as acute appendicitis with local peritonitis or recent perforated peptic ulcer, a dose of 10 g is used In these cases drainage of the peritoneal cavity and postoperative chemotherapy are employed only when contamination is severe and the risk of general peritonitis great Only cases with grave general peritonitis or gross peritoneal contamination received postoperative reinforcement Of these, 7 cases were treated with intraperitoneal sulphanilamide plus postoperative sulphapyridine, with 1 death, 17 were treated with intraperitoneal sulphanilamide alone, also with 1 death

Clearly a high concentration in the blood will be maintained for a longer period if the intraperitoneal dose is reinforced, and this may slow down absorption from the peritoneal cavity, though we have no evidence that it does

The concentration of sulphanilamide attained in the blood is very variable If the intraperitoneal dose is not reinforced postoperatively, we have found that a peak is reached in about 12 hours with a concentration of 7–12 mg per 100 c cm, the figure then dropping to zero at 36–48 hours A peak of 20 mg per 100 c cm or even higher may however be reached and absorption may continue up to 3 days These figures agree with those recorded by Mueller (1941) If postoperative chemotherapy is employed the concentration of sulphanilamide plus sulphapyridine * in the blood may be maintained almost indefinitely at about 5–10 mg per 100 c cm by a dose of 1 g of sulphapyridine 6-hourly, the figure dropping to zero very rapidly on the cessation of chemotherapy In one case we left at operation a capillary rubber tube leading into the peritoneal cavity, through which postoperatively a suspension of sulphanilamide was introduced This procedure was abandoned on finding that it apparently produced pain

Blood concentrations of sulphanilamide and of sulphanilamide plus sulphapyridine in some of our cases are shown in figs 1 and 2 In fig 1 intraperitoneal sulphanilamide was supplemented by postoperative sulphapyridine, while in fig 2 chemotherapy was limited to intraperitoneal sulphanilamide

CASE-RECORDS

In the following illustrative cases intraperitoneal sulphanilamide seemed to contribute materially towards recovery Two other such cases have already been recorded (1941)

CASE 1 —A man of 60, admitted with acute on chronic *large gut obstruction and a large palpable mass in the left* iliac fossa Operation (R S) revealed an extensive growth of the pelvic colon which had infiltrated into a loop of small gut A preliminary colostomy was considered inadvisable, as it was thought that the small gut might become obstructed before the second operation Accordingly, the whole mass was excised with a deep V of mesocolon Primary anastomosis of the small gut was performed, and the large gut was dealt with by invaginating the stump of the terminal pelvic colon and bringing out the upper loop as a terminal colostomy Careful powdering of danger points with sulphanilamide and the injection of a suspension of sulphanilamide in saline generally into the peritoneal cavity was followed by a convalescence uncomplicated by any trace of peritonitis

*In this case 15 g of sulphanilamide was used in the peri*toneal cavity and was supplemented by 1 g of sulphapyridine intramuscularly 6 hourly for 48 hours starting 12 hours after operation The resulting concentration in the blood is shown in fig 1, curve 1

CASE 2 —A man of 34, admitted two months after a laparotomy at another hospital for a strangulated internal hernia treated by simple release The strangulated loop had proved not viable, but fortunately when the wall of the gut sloughed an external fistula developed through the wound Six weeks with a fistula of his small gut left him with a severe excoriation of the skin of his abdomen extending from the costal margins to the inguinal ligaments, while dehydration and emaciation were extreme Careful attention was given to his nutritional needs and particularly to his fluid balance chart, fluid intake by mouth at first being supplemented by intravenous drip saline A catheter inserted into the fistula was connected to a continuous suction apparatus in order to divert as far as possible the extremely alkaline intestinal contents from the skin of the abdominal wall, which was dressed with an ointment containing 5% hydrochloric acid After 5 weeks the abdominal skin was healed, except for a very small circle round the fistula The patient was gaining weight and his general condition was much improved The abdomen was explored (R V H) through a new incision *through normal skin A one stage resection of the* fistula and the loop of small gut concerned was followed by a primary intestinal anastomosis Convalescence was rapid and free from any trace of peritonitis

In this case 10 g of sulphanilamide was used in the peritoneal cavity and was supplemented by 1 g of sulphapyridine intramuscularly or by mouth 6 hourly for 3 days, starting 12 hours after operation The resulting concentration in the blood is shown in fig 1, curve 2

CASE 3 —A man of 47, operated on (R S) for acute pancreatitis *Drainage of the peri pancreatic tissue* was carried out and 15 g of sulphanilamide implanted in the peritoneal cavity Further operative procedures were considered inadvisable because of the patient's poor condition, although stones were felt in the gall bladder A swab from the necrotic peri pancreatic tissues gave a pure culture of *Bacterium coli* The patient made a good recovery, but later cholecystectomy was advised, in view of the stones felt at operation and a cholecystogram confirming chronic cholecystitis and cholelithiasis Before this could be performed the patient was readmitted for the sudden onset of obstructive jaundice *At a second* laparotomy (R V H) it was particularly noticed that the abdomen was free from adhesions of any consequence and it was clear that the acute pancreatitis could not have been followed by peritonitis of any severity Cholecystectomy and removal of stones impacted in the ampulla of Vater was followed by the insertion of a T tube into the common bile duct and the implantation of 10 g of sulphanilamide into the peritoneal cavity A swab from the lumen of the common bile duct again gave a pure culture of *Bact coli* At the end of 10 days a cholangiogram, by means of 'Lipiodol' injected directly into the T tube, demonstrated a biliary system free from obstruction and the T tube was then removed Convalescence was again rapid and complete

CASE 4 —A woman of 39, admitted with acute pancreatitis and a urinary diastase of over 200 At operation (R S) *the* peri pancreatic tissue was drained, a gall bladder full of stones was removed, the common bile duct was drained with a T tube and 10 g of sulphanilamide was implanted into the peritoneal cavity There was also considerable intestinal dilatation due, it is *thought,* to splanchnic irritation om the variations in skill and technique which will therefore reflect only the inherent resuscitability of the three anæsthetics.

---

*metric estimation was employed for sulphanil ridine, so that where both were used blood the total effective fraction

The data obtained in the course of 600 resuscitations from apparently permanent respiratory arrest are summarised in the table.

RESUSCITABILITY OF ETHER, DIVINYL ETHER AND CHLOROFORM

Anæsthetic	No. of dogs	Median dose* in c.cm. per kg.	Respiratory arrests produced	Failures to resuscitate
Ether	62	1.69	250	2 (0.8%)
Divinyl ether	61	0.68	137	4 (2.9%)
Chloroform	69	0.18	213	22 (10.3%)

* The range of the doses required to produce respiratory arrest was for ether 0.97–3.3 c.cm. per kg., for divinyl ether 0.5–1.24 c.cm. per kg. and for chloroform 0.11–0.275 c.cm. per kg.

DISCUSSION

The contrast between ether and chloroform from the point of view of resuscitation is significant. In our experiments death was more than ten times as likely to result from an overdose of chloroform as from ether. It is safe to assume a priori that if an anæsthetic is seriously deficient in resuscitability then its clinical use will entail an unduly high mortality. The fact that chloroform is more dangerous than ether has of course been recognised for many years. There are today comparatively few who would maintain that under equal conditions of skill and care in administration chloroform is the safer. Yet this simple and easily proven fact was learned only a posteriori and after many decades of clinical observation, millions of anæsthesias and the needless sacrifice of an unknown number of lives. It is therefore pertinent to ask why this should have been so and if today the evaluation of proposed new anæsthetics is conducted in a *satisfactory manner*. We believe that much of the controversy and uncertainty concerning recently introduced agents is unnecessary and could be avoided by a more thorough preliminary pharmacological study including study of the property of resuscitability and by better provision for the systematic collection of clinical data.

Divinyl ether is one of the newer anæsthetics which is still in the process of evaluation. Our experiments with this drug resulted in 4 deaths or a 2.9% failure rate in 137 attempts to resuscitate from respiratory arrest. The series is too small to warrant a dogmatic statement but it does provide a strong suggestion that the resuscitability of divinyl ether is less than that of ether. The inferiority of chloroform to both these agents is clearly indicated.

Resuscitation from an overdose of an inhalation anæsthetic is made possible by the fact that respiratory arrest develops before failure of the circulation. The period which separates respiratory arrest from circulatory failure might be termed the "resuscitation interval" because it is only during this interval that an attempt at resuscitation is likely to be successful. The issue of life and death therefore, is determined by the direction which physiological events can be induced to take during this brief but critical period. Our experience with many hundreds of resuscitations has impressed us with the importance of the following general considerations.

Length of resuscitation interval.—If other influences remain equal the advantage will lie with the anæsthetic which provides the longest interval between respiratory arrest and circulatory failure. The behaviour of the circulation after respiratory arrest is the determining factor here. There is little doubt that chloroform is inferior in this respect.

Vigour of the circulation.—Forced ventilation of the lungs after respiratory arrest replenishes the oxygen supply within the alveoli and lowers the tension of the anæsthetic in the respiratory passages. This alone will not ensure resuscitation. For success there must be sufficient circulatory volume per minute to provide effective transport of gases between the lungs and body tissues. Unless this is so the concentration of the anæsthetic in the body tissues will not be reduced and anoxæmia will continue to deepen until death results. The most efficient artificial respiration therefore, cannot save a patient whose circulation lacks the necessary vigour. From the point of view of the vigour of the circulation at the time of respiratory arrest chloroform is inferior to both ether and divinyl ether.

Rate of elimination.—It is obvious that the more rapidly an anæsthetic can be eliminated by forced ventilation of the lungs the greater are the chances for resuscitation. Again chloroform is decidedly inferior and resuscitation from an overdose is correspondingly slow. In contrast divinyl ether is very rapidly eliminated and resuscitation is in most instances very easy. The ease and speed of resuscitation from divinyl ether, however is apt to be deceptive and should not be regarded as a certainty. Resuscitation from ether overdose in our experience was more certain.

Synergism between anoxæmia and the circulatory toxicity of anæsthetics.—Although respiratory arrest in nearly all instances occurs before the concentration of the anæsthetic is sufficient of itself to cause failure of the circulation unfortunately it is rapidly followed by the development of anoxæmia. The ultimate failure of the circulation is thus due to a synergistic action between the deepening anoxæmia and what might otherwise be a non-lethal concentration of the anæsthetic. The implication of this fact is clear. Every effort should be made to prevent anoxæmia during anæsthesia if only because the presence of anoxæmia at the time of respiratory arrest greatly prejudices the chances of resuscitation. The antidotal action of high concentrations of oxygen against the circulatory toxicity of anæsthetics is illustrated by our experience with chloroform. In the course of our experiments we have administered approximately 500 toxic doses of chloroform by a very brusque method in which all the established principles of safe administration were violated and yet in only one instance was primary cardiac collapse observed. In all other cases the animals proceeded to respiratory arrest through the regular sequence of the stages of anæsthesia. This is in remarkable contrast to the commonness of cardiac collapse when chloroform is very rapidly and carelessly administered to dogs by the conventional drop method. It seems evident that the use of pure oxygen instead of air as a volatilising medium served to protect the heart from the usual toxic effects of chloroform.

Adductor spasm of the cords is often responsible for failure to resuscitate. Our experience with nearly 1000 resuscitations has impressed on us that the first step in resuscitation should be the establishment of a patent airway.

Food in the stomach may be a serious handicap to resuscitation. In our early experiments the dogs were allowed free access to food. As a consequence many of the animals anæsthetised had recently eaten. When such dogs are subjected to the manipulations of artificial respiration while in a state of complete relaxation the contents of the stomach are apt to be forced into the pharynx. Death from acute asphyxia often results. In the experiments reported here the animals were deprived of food for 12 hours before the administration of the anæsthetic.

Limitations of analeptics.—In two earlier papers (1939, 1941) we reported experiments dealing with the usefulness of nikethamide ('Coramine') and leptazol (metrazol) as aids to resuscitation from an overdose of these three anæsthetics. We obtained some evidence of a favourable action by leptazol but nikethamide appeared to be useless or even harmful. In any case no analeptic is known which is capable of producing prompt and certain ventilation of the lungs in a subject in a state of respiratory paralysis. The most important thing in resuscitation, therefore, is to begin artificial respiration.

SUMMARY

Previous studies of the toxicity of anæsthetics have been concerned mainly to determine the margin of safety. To complete the pharmacological analysis it is necessary to take into account the probability of death in the event of overdose.

Studies have been made of the effects of anæsthetics on the circulatory system and the rate of elimination, but there has been no systematic attempt to determine the probability of resuscitation from a standardised lethal dose of an inhalation anæsthetic. We have tried to accomplish this with ether, divinyl ether and chloroform.

Respiratory arrest was induced in dogs by giving measured doses of the anæsthetic (graded according to

is extremely difficult to assess. We have given a postoperative course of sulphapyridine to a small number of cases but are by no means satisfied that this is necessary or beneficial. Certainly our results when using intraperitoneal sulphanilamide plus postoperative sulphapyridine have been no better than those with intraperitoneal sulphanilamide alone. Our series is, however, too small to make any dogmatic pronouncement, and further work is necessary to elucidate this point.

Bearing in mind the large doses of sulphanilamide employed and the rapid absorption from the peritoneal cavity, it is hardly surprising that the patient usually exhibits, for a day or two, signs of sulphanilamide intoxication. If not expected, the dusky hue of the patient for 24–48 hours after operation may prove alarming. Nevertheless, we have had no case in which symptoms caused by the sulphanilamide have given rise to anxiety, nor have we noticed a fall in the white-cell count of any patient which could not be explained by the elimination of a focus of infection. This agrees with the prevalent view that serious toxic manifestations are more likely to follow the administration of moderate dosages continuously over a long period than one large dose. Jackson and Coller (1942) mention the frequency with which jaundice was noted when intraperitoneal sulphanilamide was combined with postoperative administration by mouth. No cases of jaundice which can be attributed to the treatment have been observed in our own cases.

Further work on the subject of intraperitoneal sulphanilamide is still necessary. New chemotherapeutic agents may be combined with, or may replace, sulphanilamide, and results may be still further improved by progress in the technique of both intraperitoneal chemotherapy and suction drainage.

SUMMARY

Since October, 1940, we have employed intraperitoneal sulphanilamide in the treatment of peritonitis and peritoneal contamination, the average dose being 10–15 g. In most cases this was the only chemotherapy employed but in a few it was reinforced with sulphapyridine given by mouth or intramuscularly for two or three days after operation. It is not yet possible to say whether this postoperative reinforcement improves the prognosis.

From September, 1939, to October, 1940, intravenous and intramuscular chemotherapy was used on many cases with disappointing results and a fatality-rate of 55.5% in cases of grave general peritonitis or gross peritoneal contamination. Between October, 1940, and October, 1941, when intraperitoneal sulphanilamide was employed as a routine, the fatality in similar cases was reduced to 8.3%.

The use of continuous gastric, duodenal or intestinal suction drainage as an additional measure is strongly advocated.

Ten illustrative cases are described in which intraperitoneal sulphanilamide is thought to have contributed materially towards recovery.

REFERENCES

Arai, K. (1921) *Pflügers Arch.* 193, 359.
Douglas, D. M. and Mann, F. C. (1941) *Brit. med. J.* i, 227.
Hudson, R. V., Smith, R. and Selbie, F. R. (1941) *Lancet*, i, 438.
Jackson, H. C. and Coller, F. A. (1942) *J. Amer. med. Ass.* 118, 194.
Mueller, R. S. (1941) *J. Amer. med. Ass.* 116, 329.
Throckmorton, T. D. (1941) *Proc. Mayo Clin.* 16, 123.

ROYAL SOCIETY OF MEDICINE.—On Tuesday, April 14, at 4.30 P.M., at the section of psychiatry of this society, there will be a discussion on testing intellectual capacity in adults. It will be opened by Dr. F. J. S. Esher, Mr. J. C. Raven and Dr. C. J. C. Earl. On April 15, at 2.30 P.M., the section of comparative medicine at the fourth meeting of their series on the control of diseases of cattle inimical to man will discuss brucellosis and sterility. The opening speakers are to be Mr. G. N. Gould, Mr. A. S. Parkes, F.R.S., and Mr. John Hammond, F.R.S. On April 17, at 2.30 P.M., Prof. G. W. Pickering will open a discussion at the section of physical medicine on physical medicine and the cardiovascular system. The section of neurology will meet on April 18 at the Wingfield Morris Orthopædic Hospital, Oxford, at 11.15 A.M. Prof. H. J. Seddon will read a paper on the clinico-pathological classification of nerve injuries, Mr. W. B. Highet on dissociated paralyses and Dr. Graham Weddell on the histology of cutaneous innervation in man.

RADIOTHERAPY IN THE PROPHYLAXIS AND TREATMENT OF KELOID

WALTER M. LEVITT
M.D. N.U.I., F.R.C.P., F.F.R.
RADIOTHERAPIST TO ST. GEORGE'S HOSPITAL AND THE PLASTIC UNIT, PARK PREWETT HOSPITAL (E.M.S.)

SIR HAROLD GILLIES
C.B.E., F.R.C.S.
PLASTIC SURGEON TO ST. BARTHOLOMEW'S HOSPITAL, CONSULTANT ADVISER IN PLASTIC SURGERY (E.M.S.)

THE value of radiations in the prophylaxis and treatment of keloid is not so widely recognised as it should be, and it seems important at the present time to attempt to define their position in the treatment of these conditions. That the resolution of keloidal processes could be accelerated by means of radiations either from radium or X rays has been known for many years. In the past, surface radium therapy has been perhaps most commonly employed, with rather haphazard dosage, but X rays have also been widely used with dosage which, if not quite so haphazard, has varied greatly in different hands and has nearly always tended to be small.

The undoubted value of radiations in the treatment of the developed keloid, even with these inexact methods, suggested to one of us (H. D. G.) that if before an operation a dose of radiation was given to the proposed line of skin incision, and the incision made while the tissues were under the influence of radiation, the occurrence of keloid might be prevented. In 1930 some experiments were carried out with the object of evolving a technique which might achieve this object.

It was thought desirable in the first place to establish the optimum dose for the treatment of a developed keloid with as great accuracy as possible. It was found that, with increasing radiation dosage, some improvement in the results was obtained until the neighbourhood of the erythema dose was reached. In this region of dosage the improvement in results was critical, and further experience has made it likely that the mild and controlled inflammatory reaction of which the erythema is the visible evidence is for some reason essential in securing the maximum resolution of the keloid. Since the erythema dose cannot be exceeded without risk of blistering and permanent marking of the skin, it was decided to adopt this as the optimum dose for keloid conditions.

A series of cases in which keloid might be expected to follow operation was therefore submitted to irradiation with this dosage, applied so as to be limited to the line of the proposed incision. The operation was then carried out during the period of active erythema—i.e., 5–10 days after the irradiation, since this was the period at which resolution began in the developed keloid. It was found that the incidence of keloid was reduced to almost negligible proportions by preoperative irradiation, although occasionally thickening did occur at a later stage of healing. For this reason, postoperative irradiation was tried in addition to the preoperative treatment, and there is little doubt that in cases in which the avoidance of the thickening is imperative the combination of pre- and post-operative irradiation is the best method of treatment. Moreover, since this entails the application of only a single dose of X rays before and one after the operation, and there are no local or constitutional reactions, the radiation treatment is in no sense an infliction on the patient.

Postoperative treatment alone has also been carried out in a number of cases and this method too has been found effective in preventing the appearance of keloid, though the results, particularly as regards the width of the resultant scar, are not so good as when treatment is given before and after operation. With either method, postoperative treatment is best carried out as soon as the stitches have been removed.

In all these cases, X rays have been used and not radium, because of the much greater ease and accuracy with which exact dosage could be delivered. In pre- and post-operative treatment, and for small keloidal scars, contact therapy has proved a convenient and effective method of application. For thicker scars, however, higher powered apparatus is necessary, and for the thickest scar masses, resulting especially from burns and scales, high voltage rays have been used as in variations in skill and technique which will therefore reflect only the inherent resuscitability of the three anæsthetics.

The data obtained in the course of 600 resuscitations from apparently permanent respiratory arrest are summarised in the table.

RESUSCITABILITY OF ETHER, DIVINYL ETHER AND CHLOROFORM

Anæsthetic	No. of dogs	Median dose* in c.cm. per kg.	Respiratory arrests produced	Failures to resuscitate
Ether	62	1.69	250	2 (0.8%)
Divinyl ether	61	0.68	137	4 (2.9%)
Chloroform	69	0.18	213	22 (10.3%)

* The range of the doses required to produce respiratory arrest was for ether 0.97–3.3 c.cm. per kg., for divinyl ether 0.5–1.24 c.cm. per kg., and for chloroform 0.11–0.275 c.cm. per kg.

DISCUSSION

The contrast between ether and chloroform from the point of view of resuscitation is significant. In our experiments death was more than ten times as likely to result from an overdose of chloroform as from ether. It is safe to assume a priori that, if an anæsthetic is seriously deficient in resuscitability, then its clinical use will entail an unduly high mortality. The fact that chloroform is more dangerous than ether has of course been recognised for many years. There are, today, comparatively few who would maintain that under equal conditions of skill and care in administration chloroform is the safer. Yet this simple and easily proven fact was learned only a posteriori and after many decades of clinical observation, millions of anæsthesias and the needless sacrifice of an unknown number of lives. It is therefore pertinent to ask why this should have been so and if today the evaluation of proposed new anæsthetics is conducted in a satisfactory manner. We believe that much of the controversy and uncertainty concerning recently introduced agents is unnecessary and could be avoided by a more thorough preliminary pharmacological study including study of the property of resuscitability, and by better provision for the systematic collection of clinical data.

Divinyl ether is one of the newer anæsthetics which is still in the process of evaluation. Our experiments with this drug resulted in 4 deaths or a 2.9% failure rate in 137 attempts to resuscitate from respiratory arrest. The series is too small to warrant a dogmatic statement but it does provide a strong suggestion that the resuscitability of divinyl ether is less than that of ether. The inferiority of chloroform to both these agents is clearly indicated.

Resuscitation from an overdose of an inhalation anæsthetic is made possible by the fact that respiratory arrest develops before failure of the circulation. The period which separates respiratory arrest from circulatory failure might be termed the "resuscitation interval," because it is only during this interval that an attempt at resuscitation is likely to be successful. The issue of life and death, therefore, is determined by the direction which physiological events can be induced to take during this brief but critical period. Our experience with many hundreds of resuscitations has impressed us with the importance of the following general considerations.

Length of resuscitation interval.—If other influences remain equal the advantage will lie with the anæsthetic which provides the longest interval between respiratory arrest and circulatory failure. The behaviour of the circulation after respiratory arrest is the determining factor here. There is little doubt that chloroform is inferior in this respect.

Vigour of the circulation.—Forced ventilation of the lungs after respiratory arrest replenishes the oxygen supply within the alveoli and lowers the tension of the anæsthetic in the respiratory passages. This alone will not ensure resuscitation. For success there must be sufficient circulatory volume per minute to provide effective transport of gases between the lungs and body tissues. Unless this is so the concentration of the anæsthetic in the body tissues will not be reduced and anoxæmia will continue to deepen until death results. The most efficient artificial respiration, therefore, cannot save a patient whose circulation lacks the necessary vigour. From the point of view of the vigour of the circulation at the time of respiratory arrest chloroform is inferior to both ether and divinyl ether.

Rate of elimination.—It is obvious that the more rapidly an anæsthetic can be eliminated by forced ventilation of the lungs the greater are the chances for resuscitation. Again chloroform is decidedly inferior and resuscitation from an overdose is correspondingly slow. In contrast divinyl ether is very rapidly eliminated and resuscitation is in most instances very easy. The ease and speed of resuscitation from divinyl ether, however, is apt to be deceptive and should not be regarded as a certainty. Resuscitation from ether overdose in our experience was more certain.

Synergism between anoxæmia and the circulatory toxicity of anæsthetics.—Although respiratory arrest in nearly all instances, occurs before the concentration of the anæsthetic is sufficient of itself to cause failure of the circulation, unfortunately it is rapidly followed by the development of anoxæmia. The ultimate failure of the circulation is thus due to a synergistic action between the deepening anoxæmia and what might otherwise be a non-lethal concentration of the anæsthetic. The implication of this fact is clear. Every effort should be made to prevent anoxæmia during anæsthesia if only because the presence of anoxæmia at the time of respiratory arrest greatly prejudices the chances of resuscitation. The antidotal action of high concentrations of oxygen against the circulatory toxicity of anæsthetics is illustrated by our experience with chloroform. In the course of our experiments, we have administered approximately 300 toxic doses of chloroform by a very brusque method in which all the established principles of safe administration were violated, and yet in only one instance was primary cardiac collapse observed. In all other cases the animals proceeded to respiratory arrest through the regular sequence of the stages of anæsthesia. This is in remarkable contrast to the commonness of cardiac collapse when chloroform is very rapidly and carelessly administered to dogs by the conventional drop method. It seems evident that the use of pure oxygen instead of air as a volatilising medium served to protect the heart from the usual toxic effects of chloroform.

Adductor spasm of the cords is often responsible for failure to resuscitate. Our experience with nearly 1000 resuscitations has impressed on us that the first step in resuscitation should be the establishment of a patent airway.

Food in the stomach may be a serious handicap to resuscitation. In our early experiments the dogs were allowed free access to food. As a consequence many of the animals anæsthetised had recently eaten. When such dogs are subjected to the manipulations of artificial respiration while in a state of complete relaxation the contents of the stomach are apt to be forced into the pharynx. Death from acute asphyxia often results. In the experiments reported here the animals were deprived of food for 12 hours before the administration of the anæsthetic.

Limitations of analeptics.—In two earlier papers (1939, 1941) we reported experiments dealing with the usefulness of nikethamide ('Coramine') and leptazol (metrazol) as aids to resuscitation from an overdose of these three anæsthetics. We obtained some evidence of a favourable action by leptazol but nikethamide appeared to be useless or even harmful. In any case no analeptic is known which is capable of producing prompt and certain ventilation of the lungs in a subject in a state of respiratory paralysis. The most important thing in resuscitation, therefore, is to begin artificial respiration.

SUMMARY

Previous studies of the toxicity of anæsthetics have been concerned mainly to determine the margin of safety. To complete the pharmacological analysis it is necessary to take into account the probability of death in the event of overdose.

Studies have been made of the effects of anæsthetics on the circulatory system and the rate of elimination, but there has been no systematic attempt to determine the probability of resuscitation from a standardised lethal dose of an inhalation anæsthetic. We have tried to accomplish this with ether, divinyl ether and chloroform.

Respiratory arrest was induced in dogs by giving measured doses of the anæsthetic (graded according to

is extremely difficult to assess We have given a post operative course of sulphapyridine to a small number of cases but are by no means satisfied that this is necessary or beneficial Certainly our results when using intraperitoneal sulphanilamide plus postoperative sulphapyridine have been no better than those with intraperitoneal sulphanilamide alone Our series is, however, too small to make any dogmatic pronouncement, and further work is necessary to elucidate this point

Bearing in mind the large doses of sulphanilamide employed and the rapid absorption from the peritoneal cavity, it is hardly surprising that the patient usually exhibits, for a day or two, signs of sulphanilamide intoxication If not expected, the dusky hue of the patient for 24–48 hours after operation may prove alarming Nevertheless, we have had *no* case in which symptoms caused by the sulphanilamide have given rise to anxiety, nor have we noticed a fall in the white-cell count of any patient which could not be explained by the elimination of a focus of infection This agrees with the prevalent view that serious toxic manifestations are more likely to follow the administration of moderate dosages continuously over a long period than one large dose Jackson and Coller (1942) mention the frequency with which jaundice was noted when intraperitoneal sulphanilamide was combined with postoperative administration by mouth No cases of jaundice which can be attributed to the treatment have been observed in our own cases

Further work on the subject of intraperitoneal sulphanilamide is still necessary New chemotherapeutic agents may be combined with, or may replace, sulphanilamide, and results may be still further improved by progress in the technique of both intraperitoneal chemotherapy and suction drainage

SUMMARY

Since October, 1940, we have employed intraperitoneal sulphanilamide in the treatment of peritonitis and peritoneal contamination, the average dose being 10–15 g In most cases this was the only chemotherapy employed but in a few it was reinforced with sulphapyridine given by mouth or intramuscularly for two or three days after operation It is not yet possible to say whether this postoperative reinforcement improves the prognosis

From September, 1939, to October, 1940, intravenous and intramuscular chemotherapy was used on many cases with disappointing results and a fatality-rate of 55 5% in cases of grave general peritonitis or gross peritoneal contamination Between October, 1940, and October, 1941, when intraperitoneal sulphanilamide was employed as a routine, the fatality in similar cases was reduced to 8 3%

The use of continuous gastric, duodenal or intestinal suction drainage as an additional measure is strongly advocated

Ten illustrative cases are described in which intraperitoneal sulphanilamide is thought to have contributed materially towards recovery

REFERENCES

Arai K (1921) *Pflugers Arch* **193** 359
Douglas D M and Mann F C (1941) *Brit med J* i, 227
Hudson, R V, Smith R and Selbie F R (1941) *Lancet* i 438
Jackson H C and Coller F A (1942) *J Amer med Ass* **118**, 194
Mueller R S (1941) *J Amer med Ass* **116**, 329
Throckmorton, T D (1941) *Proc Mayo Clin* **16**, 423

ROYAL SOCIETY OF MEDICINE —On Tuesday, April 14, at 4 30 P M, at the section of psychiatry of this society, there will be a discussion on testing intellectual capacity in adults It will be opened by Dr F J S Esher, Mr J C Raven and Dr C J C Earl On April 15, at 2 30 P M, the section of comparative medicine at the fourth meeting of their series on the control of diseases of cattle inimical to man will discuss brucellosis and sterility The opening speakers are to be Mr G N Gould, Mr A S Parkes, F R S, and Mr John Hammond, F R S On April 17, at 2 30 P M, Prof G W Pickering will open a discussion at the section of physical medicine and the cardiovascular system The section of neurology will meet on April 18 at the Wingfield Morris Orthopædic Hospital, Oxford, at 1 15 P M Prof H J Seddon will read a paper on the clinico pathological classification of nerve injuries Mr W B Highet on dissociated paralyses and Dr Graham Weddell on the histology of cutaneous innervation in man.

RADIOTHERAPY IN THE PROPHYLAXIS AND TREATMENT OF KELOID

WALTER M LEVITT
M D N U I, F R C P, F F R
RADIOTHERAPIST TO ST GEORGE'S HOSPITAL AND THE PLASTIC UNIT PARK PREWETT HOSPITAL (EMS)

SIR HAROLD GILLIES
C B E, F R C S
PLASTIC SURGEON TO ST BARTHOLOMEW'S HOSPITAL, CONSULTANT ADVISER IN PLASTIC SURGERY (EMS)

THE value of radiations in the prophylaxis and treatment of keloid is not so widely recognised as it should be, and it seems important at the present time to attempt to define their position in the treatment of these conditions. That the resolution of keloidal processes could be accelerated by means of radiations either from radium or X rays has been known for many years In the past, surface radium therapy has been perhaps most commonly employed, with rather haphazard dosage, but X rays have also been widely used with dosage which, if not quite so haphazard, has varied greatly in different hands and has nearly always tended to be small

The undoubted value of radiations in the treatment of the developed keloid, even with these inexact methods, suggested to one of us (H D G) that if before an operation a dose of radiation was given to the proposed line of skin incision, and the incision made while the tissues were under the influence of radiation, the occurrence of keloid might be prevented In 1930 some experiments were carried out with the object of evolving a technique which might achieve this object

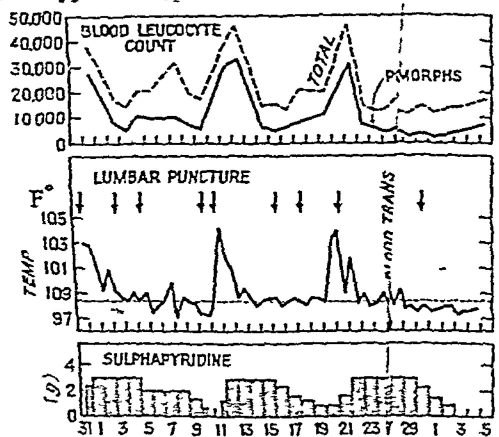
It was thought desirable in the first place to establish the optimum dose for the treatment of a developed keloid with as great accuracy as possible It was found that, with increasing radiation dosage, some improvement in the results was obtained until the neighbourhood of the erythema dose was reached In this region of dosage the improvement in results was critical, and further experience has made it likely that the mild and controlled inflammatory reaction of which the erythema is the visible evidence is for some reason essential in securing the maximum resolution of the keloid Since the erythema dose cannot be exceeded without risk of blistering and permanent marking of the skin, it was decided to adopt this as the optimum dose for keloid conditions

A series of cases in which keloid might be expected to follow operation was therefore submitted to irradiation with this dosage, applied so as to be limited to the line of the proposed incision The operation was then carried out during the period of active erythema—i e, 5–10 days after the irradiation, since this was the period at which resolution began in the developed keloid It was found that the incidence of keloid was reduced to almost negligible proportions by preoperative irradiation, although occasionally thickening did occur at a later stage of healing For this reason, postoperative irradiation was tried in addition to the preoperative treatment, and there is little doubt that in cases in which the avoidance of the thickening is imperative the combination of pre- and post-operative irradiation is the best method of treatment Moreover, since this entails the application of only a single dose of X rays before and one after the operation, and there are no local or constitutional reactions, the radiation treatment is in no sense an infliction on the patient

Postoperative treatment *alone* has also been carried out in a number of cases and this method too has been found effective in preventing the appearance of keloid, though the results, particularly as regards the width of the resultant scar, are not so good as when treatment is given before and after operation With either method, postoperative treatment is best carried out as soon as the stitches have been removed

In all these cases, X rays have been used and not radium, because of the much greater ease and accuracy with which exact dosage could be delivered In pre and post-operative treatment, and for small keloidal scars, contact therapy has proved a convenient and effective method of application For thicker scars, however, higher powered apparatus is necessary, and for the thickest scar masses, resulting especially from burns and scales, high voltage rays have b [illegible] as in revealed clear fluid, with 110 white cells (chiefly lymphocytes) per c.mm.; but the gram film still showed some pneumococci, although culture was negative On Sept 30 the child was still irritable, and his right arm weak. X ray of the chest at this time was again negative, and Mr Archer Ryland found no focus of infection in the ear, nose or throat The CSF showed a further reduction in white cells and was sterile The dosage of sulphapyridine was reduced, the general condition remained remarkably good, and the sulphapyridine was finally discontinued on Oct 2 During the second course 49 5 g were given over 22 days, and the total quantity administered over 32 days was 74 g After withdrawal of the drug, the child continued to improve rapidly and by Oct 7 there was no sign of meningitis The CSF was clear with 32 white cells (95% lymphocytes) per c mm, and sterile The weakness of the right arm had almost completely recovered, though he showed a disinclination to use the right hand When transferred to convalescent home on Oct 23 he was perfectly well, bright and playful

Blood changes—Daily examinations of the blood were performed throughout the illness (see chart) The first gave a polymorph count of 27,740 per c.mm This gradually fell to the region of 4000–5000, but rose again at the first relapse to 30,000–33,000 per c.mm The polymorphs fell to 5230 as the condition improved, but at the second relapse they rose again to 31,280 per c.mm After this in spite of long and heavy dosage with sulphapyridine the polymorph count never fell below 2240 per c.mm Throughout almost the entire illness, primitive white cells were present in the peripheral blood and from Sept 5 onwards, the proportion of metamyelocytes varied from 2% to 6% of the total white cell count There was thus evidence of such marrow regeneration to compensate for the destruction of cells by the toxæmia and possibly by the sulphapyridine Similar marrow hyperactivity was shown by the presence of nucleated red cells in the peripheral blood, the number seen while counting 200 white cells varied from 2 to There were also varying degrees of polychromasia, punctate basophilia and anisocytosis and poikilocytosis The hæmoglobin level had fallen by Sept 10 to 48% and ferri et ammon cit, gr 15 daily, was begun Until Sept 24, the hæmoglobin varied from 42 to 50%, but after the blood transfusion on Sept 25, it gradually rose until on discharge it was



DISCUSSION

Pneumococcal meningitis is usually divided into two classes—primary and secondary The secondary cases are associated with a pneumococcal focus elsewhere, usually an otitis, sinusitis, mastoiditis, thrombosis of lateral sinus or pneumonia Pneumonia of course may also occur secondarily in a primary pneumococcal meningitis The primary cases are those in which no preliminary focus is discoverable and one can only assume that the pneumococcus enters the circulation through some minor nasopharyngeal lesion and his colleagues (1940) have shown that many so-called primary cases coming to autopsy undiagnosed sinusitis (particularly of the relatively inaccessible ethmoid and sphenoidal sinuses) is often discovered Grossman (1940) affirms that half the total cases are primary, but this applies more particularly in adults In the young primary cases are very uncommon

Before the introduction of sulphonamides, the fatality from the disease in young children was almost 100% I have been able to find reports of only 4 cases of spontaneous recovery from pneumococcal meningitis in children under the age of 5 years in presulphonamide times (Hall 1923, Uhr 1929, Ravenil 1936, Frankmann and Stewart 1937) The use of specific serum alone was responsible for occasional successful cases But since the introduction of sulphonamides many cases have been successfully treated, mostly in adults and older children, the disease has remained extremely serious in children under 5 years (Cooke 1941) Up to the end of 1940, I can find reports of only 7 cases of recovery in children under 5 years treated with sulphonamides, and only 2 of these were under 2 years

Young (1938) reports recovery of a child of 5 years treated with sulphanilamide alone, and Landon (1938) recovery of a child of 5 years treated with azosulphamide Sherman (1940) treated a child of 2½ successfully with sulphapyridine, and Moore and Forbes (1940) a child of 5, who took 113 g sulphapyridine Grossman (1940), reporting 27 fatal cases in children, describes success in an infant at 3 months, who was given 94 g of sulphapyridine and 44 g of sulphanilamide, together with specific serum Neal and his colleagues (1940) describe recovery in a child of 1¼ years, treated with sulphapyridine, and Dawnay (1940) recovery in a child of 4 years also treated with sulphapyridine alone. Recently, Howard (1941) reported a further case of recovery in an infant of a year treated with sulphathiazole

All other reported cases under the age of 5 years treated with the sulphonamide group proved fatal. Steele and Gottlieb (1941) in a recent comprehensive statistical study of all reported cases in which chemotherapy had been used successfully were not able to discover a single recovery in children under 2 years

All observers agree that large doses of sulphonamides are essential, and a concentration of the drug in the cerebrospinal fluid of 8–10 mg per 100 c cm is to be aimed at as soon as possible Some therefore advocate the intravenous route to start with, but oral administration is to be preferred wherever possible, especially in infants who are more tolerant of the drug than adults Only where the drug is not tolerated by mouth should parenteral injections be considered Many, especially in America advocate specific antipneumococcal serum in addition, but this necessitates typing the pneumococcus early and having the suitable serum available In the present case no serum was administered Of course, if there is any surgical focus of pneumococci, such as an otitis or sinusitis, this must be dealt with

Two relapses occurred in this case the first on withdrawing and the second on merely reducing the dosage of sulphapyridine, both the relapses happened after the CSF fluid had given a sterile culture A similar condition has been noted by Raman (1939) Falla (1940) and Dawnay (1940) Dawnay described such a case in a child of 4 years in whom four exacerbations occurred at weekly intervals each time after withdrawal of the drug with eventual recovery It is difficult to explain whence the organisms re-enter the CSF in these so-called primary cases especially after the cerebrospinal fluid has been rendered sterile In the present case the chest was clear, the ears were normal and there was no evidence of mastoiditis or cranial bone infection the mouth and pharynx were clear, and the sinuses unaffected. Nevertheless the nasal discharge suggests that there may have been a focus of infection in the nasopharyngeal region which was not discovered The paresis of the right upper limb suggests another possible explanation in that there may have been a cortical or subcortical lesion perhaps a superficial thrombophlebitis from which the cerebrospinal fluid was being reinfected This is compatible with the presence of exudate over the superior aspect of the cerebrum, which is characteristic of the morbid anatomy of this disease Steele and Gottlieb (1941) at autopsy on one of their cases found foci of superficial cerebral thrombosis underlying the exudate

The tolerance to the drug was extremely good in my case, as is usual in childhood and infancy There was no vomiting, blood changes were mild and there were no other toxic signs All observers agree (Rhoads et al. 1940) that blood-transfusion is to be preferred to withdrawal of the drug if mild toxic blood signs occur, body-weight) volatilised within a closed soda-lime absorption system, attempts were then made to revive the animals by artificial respiration and oxygen A rigid technique was used throughout

Data from 600 cases were as follows after 250 respiratory arrests produced by ether there were 2 (0 8%) failures to resuscitate, after 137 arrests produced by divinyl ether there were 4 (2 9%) failures, after 213 arrests produced by chloroform there were 22 (10 3%) failures Thus respiratory arrest produced by chloroform is much more likely to prove fatal than that produced by ether or divinyl ether

Resuscitation after an overdose of an inhaled anæsthetic is made possible by the fact that respiratory arrest develops before circulatory failure We have termed the period separating respiratory arrest from failure of the circulation the resuscitation interval because it is only during this interval that resuscitation is likely to be successful The longer this interval is the greater is the probability of resuscitation

Unless the circulatory volume per minute at the time of respiratory arrest is sufficient to provide effective transport of gases between the lungs and body tissues artificial respiration will not be effective

In general, rapid elimination of an anæsthetic is associated with rapid recovery from overdose, but mere speed of elimination is not synonymous with certainty of resuscitation

Anoxæmia is synergistic with the toxicity of anæsthetics Thus satisfactory oxygenation at the time of respiratory arrest favours resuscitation Spasm of the vocal cords or food in the stomach (which may be expelled into the pharynx during artificial respiration) may prevent adequate ventilation of the lungs by artificial respiration and seriously prejudice the chances for resuscitation

Analeptics in general are uncertain stimulants of the paralysed respiratory centre and in fact may do harm The most important method of treating respiratory arrest is prompt artificial respiration, supplemented by oxygen

The divinyl ether used was supplied by Merck and Co, Rahway, N J

REFERENCES

Coughlin W T (1911) *J Amer med Ass* 57, 17

Draper, W B and Whitehead, R W (1938) *Surg Gynec Obst* 67, 436

Whitehead and Draper (1939) *Ibid*, 68, 892

— — (1942) *Ibid* In press

PNEUMOCOCCAL MENINGITIS IN AN INFANT

RECOVERY WITH SULPHAPYRIDINE

A SAKULA, M D LOND, M R C P
FORMERLY ASSISTANT MEDICAL OFFICER AT HIGHGATE (LCC) HOSPITAL

PNEUMOCOCCAL meningitis, before the introduction of modern chemotherapy, was almost always fatal Since the introduction of sulphonamide therapy, however, many cases successfully treated have been reported Most of the recoveries have been in adults and older children, only a very few have been reported in infants The following case of pneumococcal meningitis in an infant was successfully treated with sulphapyridine

CASE-REPORT

A male infant aged 17 months was admitted to the Highgate Hospital on Aug 31, 1941 There was no history of any previous illness For a week before admission he had had a mucoid discharge from the right nostril and on Aug 30 he began to vomit, became drowsy and developed convulsive movements Next day he had become drowsier, and finally comatose On admission he was almost moribund, temperature 103° F, pulse rate 172, respirations 46 He was comatose, with occasional twitchings of the whole body associated with piercing cries There was slight neck rigidity, with the head persistently turned to the right side, but Kernig sign was negative The anterior fontanelle was still patent and not bulging The pupils were dilated, the ocular fundi normal, and findings in the central nervous system were otherwise negative, except for a doubtful weakness of the right arm The right eardrum was slightly dulled Heart, lungs and abdomen seemed normal A diagnosis of meningitis was made, and lumbar puncture performed The cerebrospinal fluid, which was at a pressure of 270 mm CSF, contained over 2000 white cells per c mm (90% polymorphs) A film showed numerous gram positive encapsulated diplococci, none of which were intracellular Culture gave a pure growth of pneumococci

Sulphapyridine was started soon after admission, and as soon as the diagnosis was established it was decided to continue the sulphapyridine in larger doses than usual owing to the known bad prognosis of pneumococcal meningitis He was given an initial dose of 1 g by mouth, followed by another 1 g after two hours, and then 0 5 g four hourly Within 24 hours the temperature had begun to fall and the general condition to improve, but neck rigidity persisted, Kernig sign had become positive, and the weakness of the right arm was more definite By Sept 3 he was much improved, and the temperature was nearly normal (see chart), but there was still some evidence of meningitis and a mild stomatitis had developed The CSF still contained pneumococci In view of the persistence of the nasal discharge and continual rubbing of the face in the region of the left eye, an attempt was made to find some focus of pneumococcal infection in the sinuses, but X ray of the sinuses and skull was negative An X ray of the chest was similarly negative, and a swab from the nasal discharge did not contain pneumococci The general condition continued to improve, and the CSF on Sept 5 contained only 210 white cells (25% polymorphs) per c mm, and was sterile On Sept 9 it was thought safe to reduce the dosage of sulphapyridine to 0 25 g six hourly Next day the temperature was normal, but he was still extremely irritable and there was still some neck rigidity Lumbar puncture revealed a clear sterile fluid, with 41 white cells (chiefly lymphocytes) per c mm Sulphapyridine was therefore discontinued, a total of 24 5 g having been administered over a period of ten days

CSF FINDINGS

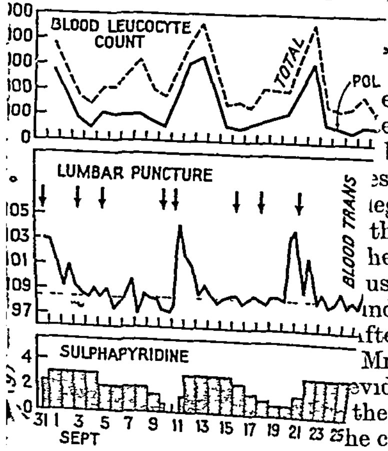
Date	On withdrawal	White cells			Pneumococci in CSF
		per c mm	Polymorphs	Lymphs	
			%	%	
Aug 31	Very turbid	2000 +	90	10	+ +
Sept 3	Faintly turbid	1450	55	45	+
„ 5	Almost clear	210	25	75	–
„ 10	Clear	41	5	95	–
„ 11	Very turbid	5300	90	10	+ +
„ 16	Clear	66	25	75	–
„ 18	Clear	73	30	70	–
„ 21	Faintly turbid	6000	95	5	+ +
„ 27	Clear	110	25	75	+
„ 30	Clear	71	10	90	–
Oct 7	Clear	32	5	95	–
„ 22	Clear	20	–	100	–

After withdrawal of the drug the clinical condition improved slightly, but after 24 hours (Sept 11) he relapsed The temperature rose to 104 2° F, pulse rate 160, respirations 60 The child was again extremely ill, very drowsy and irritable, with increased neck-rigidity The eardrums were normal, and the chest clear Lumbar puncture revealed fluid more turbid than at the onset of the illness, with 5400 white cells (90% polymorphs) per c mm, and numerous pneumococci both in the gram film and on culture Sulphapyridine was immediately recommenced, 0 5 g being given four hourly, and within 36 hours the temperature had fallen and the general condition had improved, although there were still signs of meningitis This improvement continued, and the CSF on Sept 16 was clear, sterile, and contained 66 white cells per c mm The sulphapyridine was therefore reduced to 0 25 g four hourly, although the infant was still very irritable A further reduction to 0 25 g t d s was made on Sept 18 Within 48 hours he relapsed for the second time (Sept 20) and the temperature rose to 104° F, pulse rate 168, respirations 56 The general condition was once more grave, and the CSF showed an increase in the number of white cells and many pneumococci There was no choice but to increase the dosage of sulphapyridine again to 0 5 g four hourly, and there was once again an immediate improvement, the temperature subsided within 36 hours, and the signs of meningitis gradually disappeared There was still weakness of the right arm, and still some nasal discharge

Meanwhile, although iron had been administered since Sept 12, he was very pale, and the hæmoglobin remained about 40–50% On Sept 25, 250 c cm of his mother's blood was given by slow drip transfusion This was followed by definite clinical improvement Lumbar puncture on Sept 27

clear fluid, with 110 white cells (chiefly lym
, but the gram film still showed some pno
culture was negative On Sept 30 the
able, and his right arm weak X ray of th
was again negative, and Mr Archer Rylai
of infection in the ear, nose or throat T
a further reduction in white cells and was
sage of sulphapyridine was reduced, the gene
remained remarkably good, and the sulpha
lly discontinued on Oct 2 During the secor
were given over 22 days, and the total
tered over 32 days was 74 g After withc
g, the child continued to improve rapidly
there was no sign of meningitis The CSF
white cells (95% lymphocytes) per c mm , a
akness of the right arm had almost c
d, though he showed a disinclination to use
When transferred to convalescent home on
ectly well, bright and playful

changes—Daily examinations of the b
ed throughout the illness (see chart) Th
orph count of 27,740 per c mm This gr
egion of 4000–5000, but rose again at the
00–33,000 per c mm The polymorphs
condition improved, but at the second
ain to 31,280 per c mm After this in
avy dosage with sulphapyridine the poly
ell below 2240 per c mm Throughout
llness, primitive white cells were presen
blood and from Sept 5 onwards, the
yelocytes varied from 2% to 6% of the
unt There was thus evidence of n
ation to compensate for the destructio
æmia and possibly by the sulphapyri
hyperactivity was shown by the presen



lls in the peripheral blood, the
ng 200 white cells varied from 2 to
g degrees of polychromasia, p
ytosis and poikilocytosis The
by Sept 10 to 48% and fer
was begun Until Sept 24
2 to 50%, but after the bl
lually rose until on discharge

DISCU

eumococcal meningitis
s—primary and secon
ssociated with a
ly an otitis, m
l sinus, or p
also occur seco
igitis The p
inary focu
the pneumoc
minor nas
s (1940)
ry cases
ularly

IRY
Council
method
ted its
reassur-
ble In
Divorce
a decree
is found
man, the
solute in
Spackman
ance at a
val of his
ce referred
at he had,
elationship
cts alleged,
professional
GMC Dr
Hempson,
orce Court
ired to call
Court, with
evidence, he
eedings and
been called
espondent, it
legal assessor
the council's
he decree *nisi*
us was on Dr
nds why the
fter deliberat-
Mr Hempson
evidence on the
then addressed
he council again
nced its decision
Spackman's name
ult, was definite
es two grounds for
for crime and a
inquiry") that the
nfamous conduct in
there been "due
eton in his minority
tive The GMC, he
s function of inquiring
ously undesirable' that
aring on the issue of adul-
as been fully investigated
Division, this, he considers,
or amending section 29, but,
there must be due inquiry by
Spackman's case the first stage
y The facts being disputed,
f the administration of justice
must hear the person against
ade and any witness whom
he desires to call The Medical Act makes proof of a conviction conclusive, it has not done so in the case of a decree of divorce The council does not hold due inquiry, says Mr Justice Singleton, merely by ascertaining that somebody else has made due inquiry and has come to a decision in a suit between different parties A finding by the Divorce Court that a man has committed adultery in one proceeding is not legally conclusive in another proceeding between different parties, the production of the decree is evidence of adultery but does not preclude the alleged adulterer from denying it A man might conceivably have reason for allowing a divorce petition in which he was cited as co-respondent to go through without strenuous opposition, and yet might desire to contest the facts if attacked later in a professional capacity It might be inconvenient for a non-legal body like the GMC to re-hear the issue of adultery, but this difficulty was to be remedied by the legislature and not by judicial decision "Members of the medical profession desire to be, and ought to be, masters within their own household, but they are governed by the terms of the Act which gives them their powers"

So much for the minority judgment in the High Court It states clearly the case for the practitioner whose whole professional career is at stake For the layman the important element in the case will be that there was fresh evidence available which might have turned the scale in Dr Spackman's favour Logically, however, it would seem that the existence of fresh evidence is immaterial If the minority judgment be right, a practitioner could dispute a divorce decree in every case before the GMC, even if he had no new witnesses to call The majority judgments of the Lord Chief Justice and Mr Justice Humphreys, on the other hand, establish that the GMC in accepting a divorce decree, does not abandon the principles of "natural justice" The council, says Lord Caldecote, is a domestic tribunal

> "I cannot believe that Parliament intended to compel the council in all cases under section 29 to act as if it were a court of law trying a criminal charge For one thing Parliament has clearly put no such duty upon the council in what perhaps are the more serious cases that come before it, namely convictions for felony or misdemeanour For another thing the council has not been equipped for any such task, it is unable either to compel the attendance of witnesses or to administer the oath to such witnesses as can be called So far as I can see, it is not bound by the rules of evidence If then the council is not constituted as, or equipped with the powers of, a court, I think it is reasonable and right to suppose that Parliament meant to leave the council to devise its own means of ascertaining the facts on which its decisions must depend"

If the council were trying allegations for the first time, it would doubtless do its best to weigh the evidence in order to arrive at a just decision but it could not do so by shutting out evidence which in fairness ought to be heard

> "A very different position is reached if the council finds that a more experienced and (as it thinks) a better fitted tribunal than itself has, after a full and fair hearing found the accused person guilty of the conduct alleged If the council takes pains to ascertain these facts I do not know why that should not be held to be 'due inquiry'"

The Lord Chief Justice observed that the ends of justice were more likely to be served by the practice followed by the council It offends no one's sense of justice that Parliament has made a jury's verdict conclusive on a charge of crime His own sense of

body-weight) volatilised within a c
absorption system, attempts were ther
the animals by artificial respiration
rigid technique was used throughout

Data from 600 cases were as follows
tory arrests produced by ether there
failures to resuscitate, after 137 arres
divinyl ether there were 4 (2 9%) fail
arrests produced by chloroform there
failures Thus respiratory arrest produce
is much more likely to prove fatal than
by ether or divinyl ether

Resuscitation after an overdose of a
thetic is made possible by the fact that r
develops before circulatory failure We
period separating respiratory arrest fro
circulation the resuscitation interval be
during this interval that resuscitation
successful The longer this interval is t
probability of resuscitation

Unless the circulatory volume per minu
respiratory arrest is sufficient to provide
port of gases between the lungs an
artificial respiration will not be effective

In general, rapid elimination of a
associated with rapid recovery from ove
speed of elimination is not synonymous v
resuscitation

Anoxæmia is synergistic with the to
thetics Thus satisfactory oxygenation
respiratory arrest favours resuscitation
vocal cords or food in the stomach
expelled into the pharynx during artifi
may prevent adequate ventilation of th
ficial respiration and seriously prejudice
resuscitation

Analeptics in general are uncertain st
paralysed respiratory centre and in fact
The most important method of treating r
is prompt artificial respiration, suppleme

The divinyl ether used was supplied by
Rahway, N J

REFERENCES

Coughlin, W T (1911) *J Amer med Ass* 57, 1
Draper, W B and Whitehead, R W (1938) *Su* 436
Whitehead and Draper (1939) *Ibid*, 68, 892
— — (1942) *Ibid* In press

PNEUMOCOCCAL MENIN IN AN INFANT

RECOVERY WITH SULPHAPYRI

A SAKULA, M D LOND, M R
FORMERLY ASSISTANT MEDICAL OFFICER AT HIGHGA

PNEUMOCOCCAL meningitis, before th
of modern chemotherapy, was almost
Since the introduction of sulphonamide
ever, many cases successfully treated have
Most of the recoveries have been in ad
children, only a very few have been repo
The following case of pneumococcal me
infant was successfully treated with sulph

CASE-REPORT

A male infant aged 17 months was admitted
Hospital on Aug 31, 1941 There was no
previous illness For a week before admissio
mucoid discharge from the right nostril and
began to vomit, became drowsy and devel
movements Next day he had become drow
comatose On admission he was almost m
perature 103° F, pulse rate 172, respiratio
comatose, with occasional twitchings of t
associated with piercing cries There was slig
with the head persistently turned to the
Kernig sign was negative The anterior fon
patent and not bulging The pupils were di
fundi normal, and findings in the central nerv
otherwise negative, except for a doubtful
right arm The right eardrum was slightly
lungs and abdomen seemed normal A diagno
was made, and lumbar puncture performed

Symptoms in the Neuroses

because it is important I BAKER, M D Lond, M R C P, physician to the
combat the pneumococc th Garrett Anderson Hospital. London H K
s Pp 49 4*s* 6*d*

A case of primary pn is a modest statement about the frequency and
infant aged 17 month er of left inframammary pain, sighing respiration
74 g of sulphapyridine pitation, in patients who came to a cardiac clinic
In treating pneumoc e without physical signs of cardiac disease The
infants, large doses of oes not go further than this, in spite of the larger
high initial dosage shoul of her title, and she does not attempt to consider
be continued for at leas hology of the symptoms in question Her
has subsided and the CS ice to the special problems of neurotic illness is
focus of infection should her casual paragraph on treatment The data
I wish to thank Dr W ard as to the frequency of these symptoms at
health of the London Co ospital are instructive, and indicate the need for
publish this paper, and udy such as has been carried out in soldiers
The pathological work was as having "effort syndrome"
the Group Laboratory at næsthesia

REFE GOLDMAN, L R C P, D A, major R A M C
Baillière, Tindall and Co Pp 235 5*s*

Cooke, W T (1941) *Lancet*, ii,
Dawnay, P F H (1940) *Brit* n
Falla S T (1940) *Ibid*, i, 804
Frankmann, R W and Stewart 1105
Grossman, A M (1940) *Arch Pe*
Hall J (1923) *Bull Soc méd Hô*
Howard S J (1941) *Lancet* ii, 5
Moore M L and Forbes R P (
Neal, J B Appelbaum, E and Ja *Ass* 115 2055
Raman (1939) *Lancet*, i 1101
Ravenil, S F (1936) *Sth med J*
Rhoads, P S et al (1940) *J Ame*
Sherman DeW H (1940) *Arch Pe*
Steele, C A and Gottlieb, J (194
Uhr, J S (1929) *Arch Pediat* 46,
Young, F (1938) *Brit med J* ii, 2

mpact handbook is at once up to date and
It is too small to cover every detail of
technique, and the principles laid down are
oo dogmatic, but it is a worthy addition to
series The chief types of apparatus in
e are illustrated Most anæsthetists are
Guedel's laryngoscope, in which the blade
are set at an acute angle to one another,
minor modification in the shape and size
lle, the instrument shown as Goldman's
seems to be identical with that of Guedel
pular laryngoscope in common use—that
also illustrated There are good sections
s for special operations, on analgesia and
midwifery, on dental anæsthesia, and on
al anæsthesia

Reviews o

Value of Health to a City graphy

Two Lectures delivered in 1873 tz, M D, director of cardiovascular research,
Translated and introduced by e Hospital, Chicago, assistant professor of
more Johns Hopkins Press University of Chicago London Henry
Max von Pettenkofer (1818 580 45*s*
biochemist, was appointed firs sential in a textbook of electrocardio
the University of Munich in 18 the tracings should be of high photo-
research into public health , by this standard Dr Katz's book,
by what had been done in En one of the most comprehensive series of
reduction of the death-rate of Lo blished, is a complete success In the
was 33 in Munich The two r so the varied pictures which result from
1873, which Sigerist has tran , ventricular hypertrophy, cor pulmonale
devoted to the contrast betwe nch block have enlarged the subject
and the reasons why London h y these are all well described, and
record Though seventy year ven to the changes due to coronary
strikingly modern and have a n classifying the types of coronary
engaged in postwar planning, e new but logical terms are used, which
promised for hygiene it has ac confusion Nearly the whole of the
kofer's part in the development e book is a good account of the arrhyth-
in the introduction Twenty y of course, the novelty and topical
appointment to Munich, Robert earlier sections cannot be maintained
of hygiene at Berlin where he te discussion of chest leads and nearly
bacteriological basis and for a reproduced include two of these leads
health practice in European ublications on cardiography this one is
American public health, starte
Chadwick and Shattuck, has itations
Simon and Snow among or, M S I A, A R P S, training officer, first-aid
statistics which led to biometr er London Jordan and Sons Pp 63 2*s*
is practised chiefly by Engl n excellent, highly compressed yet clear
Pettenkofer really belongs to the edure for treating blister gas casualties
an all-round man and used eve ARP handbooks 1 and 2, and gives
advance public health, but he tions which these handbooks do not
influence in the development of in the casualty service should read this
that direction He was insisten even if they are not directly concerned
he held that England was far ahe ng stations the information given here
and even ahead of ourselves, for value There are 6 first-class photo-
were kept spotlessly clean," tha ilding layout plans The text is mostly
will evacuate and condemn a dw summaries, examples of records and
has been overcrowded beyond a
otherwise been found unfit for Heinemann (Medical Books) have
that "facilities for bathing are m nglish rights of "Shock Treatment in
in English households" This Lucie Jessner and V G Ryan which was
of Pettenkofer as an old man lo columns on March 21 (p 356) They
Darwin forms the frontispiece ook in this country in the last week of
has done good service in giving the fice will be 17*s* 6*d*
lectures and discarding the
published in the *Sanitarian* in 1

y patients as being less painful Rectal administration (novurit and salyrgan suppositories) was ss effective and more unpleasant than tablets by mouth, and in more than a third of patients produced no diuretic response whatever The most triking finding was the value of oral preparations, hough here again there were some failures Mersalyl, alyrgan and neptal tablets each containing 0 08 g of the mercurial salt plus 0 04 g of theophylline, were compared, the patient being given gr 30 of ammonium chloride, followed by 2 4, 6 or 8 tablets as a single dose, or 2 tablets three times during the day A dose of 4 or 6 tablets of neptal worked best, and a single dose, though more apt to produce vomiting, was less apt to produce diarrhœa than divided doses EVANS and PAXON met with no serious complications They agree that premedication with ammonium chloride is superior to other methods, and they favour a single dose of gr 30 (four enteric-coated chocolate tablets containing gr 7½ each) given two hours before the mercurial diuretic They did not study the effect of giving large doses of ammonium chloride (gr 30 three or even four times a day) over long periods, but it is reassuring to know that their simple technique of premedication is as effective as the previous methods which occupied two days, for there are obvious disadvantages in delaying the mercurial when cardiac failure is accompanied by gross dropsy For patients confined to bed with œdema from cardiac failure EVANS and PAXON recommend the injection of a mercurial diuretic (2 c cm) every third day, during the ambulatory stage a mercurial may be given by mouth once or twice weekly according to the severity of the case If this experience at the London Hospital is confirmed oral preparations should find an extensive following in private and outpatient practice for one of the disadvantages of the mercurial diuretics has been the necessity of giving them by injection or by rectum

THE SUPPLY OF DENTISTS

The numbers on the present register are hardly adequate for a post-war dental health service The strength of the present register will drop rapidly in about ten years' time as those registered under the 1921 act retire or die Student entries are falling, and will continue to fall unless the profession attracts more entrants As student entries affect the register five years ahead, the seriousness of the problem should be fully realised now

A lean time is coming for the care of the nation's teeth This, although long heralded has never been so convincingly set out as in the memo[1] of which the concluding summary is reproduced above It may not appear as critical as the situation met by the Dentists Act of 1921 when the roll of dentists suddenly jumped up from 5831 to 12,762 by the inclusion of all bona-fide practitioners, but it will be more difficult to meet, for in future there will be no convenient pool of undiplomated dentists to draw on The late SIR FRANCIS ACLAND was tireless in his insistence on what he called a rule-of-three sum, which formed the burden of several of his addresses to the Dental Board If, he was wont to inquire, 250 new licentiates a year were needed to maintain the pre-act register of 5000, how many licentiates (which means a larger number of entrants) would be required to maintain the post-act register of 14–15,000 ? The answer, he said, was 700—but the entry was not even half this figure It now averages 317 And if it should be argued that surely a roll of 15,000 is more than enough, the refutation was simple in 1939 when dental graduates were being absorbed into practice as soon as they appeared and the competition for public appointments was meagre

The acuteness of the coming famine needs a little explaining but Dr WILKINSON makes it very clear During the years 1922–23 more than 8000 persons came on the register and assuming their average age as above 30 then in 1951 they will be at least sexagenarian and the lustrum 1955–60 will witness their loss through retirement or death This is certain, but since the Dentists Register has not been classified according to age-groups it is not possible to predict with certainty the exact number of new entrants required each year to maintain the register despite this coming exitus He has however worked out with the help of Mr H W SINGER, Ph D , the probable age-distribution of dentists practising in this country at the present moment

Aged 60–67	1205	25–30	1303
50–60	3280	Under 25	716
40–50	5056		
35–40	1869	Total	14,428
30–35	999		

The table, which is based on the assumption that all new graduates are 23 years old and that dentists retire or cease to be effective at 67, implies the retirement of 172 persons a year in 1943–49, 328 a year in 1950–59, and 505 a year in 1960–69 To replace this wastage will require a student entry of 364 a year in the coming decade and of 560 in 1955 And Dr WILKINSON reminds us that it is necessary to think five years ahead and that 10% of entrants fail to qualify

As things are there is no prospect of the need being met and the memo ends with some highly practical suggestions At present, on account of the high cost of the course, and because considerable capital is required to buy or establish a practice, dentistry has to recruit students from a somewhat limited class in possession of financial resources The professions of medicine and law are also open to this class, and by reason of their higher social status and financial reward they outweigh the attractions of dentistry as a career If, however, the cost of the dental course were reduced, and so made a possible choice for those who now take engineering, architectural or science courses, it would, in view of a good livelihood immediate on qualification attract more entries Furthermore, if the Dental Board were to resume its bursary scheme and other scholarships were provided, some students now constrained to enter the teaching profession would have an opportunity of making dentistry their career It really boils down to this (1) Make dentistry more attractive by raising the social status of the profession and by levelling up the prospects in later life to those in medicine and law (2) Open the choice wider by lowering dental school fees and providing scholarships The first policy cannot be made effective soon enough to prevent a disastrous fall in the numbers on the register The second policy could be effected immediately, without interfering with the first as the ultimate aim justice was not offended by the similar acceptance of the Divorce Court's finding. From the court's finding of adultery there was, as Mr Justice Humphreys pointed out, no appeal. The latter judge, concurring with the Lord Chief Justice, gave his opinion that the High Court has no duty and no right to dictate to the GMC what witnesses it must hear, unless the refusal to hear them constituted a violation of the principles of natural justice. Those principles could not require the GMC to adopt a course which he believed would be "refused, in the circumstances, by any court of justice in the kingdom, appellate or otherwise."

---

[1] Memo on the decline in student entries to dental courses prepared for the Dental Education Advisory Council by Prof F C Wilkinson M D M SC , D D SC and sent to the Ministry of Health and its Scottish counterpart

It is not entirely satisfactory that a dispute of this kind should be decided by a majority of two judges to one, though the same position was visible in the famous case of Leeson, where the "natural justice" of the GMC was challenged in 1889 and where Lord Justice Fry disagreed with a majority which contained Lord Justice Bowen. The Spackman case does not greatly fortify the reformers who desire to see a right of appeal to the High Court from the GMC. Clearly the High Court would not have reopened the decision of the Divorce Court in the absence of any element of fraud or other overwhelming cause. If any change in the law be called for, it may be that the council should be given proper powers to summon witnesses and place them upon oath. The council's dilemma is probably due to the fact that the passing of the Medical Act in 1858 antedated by only a few months the operation of the Matrimonial Causes Act which created the modern scheme of divorce by judicial decree in England. Parliament at that time would hardly have foreseen such a problem as the Spackman case has propounded. Pending any amendment of the law, it is comforting to find that the judges find no fault with the procedure which the GMC has made it a practice to follow or with the essential fairness of the domestic tribunal of the profession.

MERCURIAL DIURETICS IN HEART FAILURE

THE clamour for diuretics dates back many centuries to the earliest association of dropsy with impairment of renal function, but until twenty years ago these drugs were chiefly remarkable for the mediocrity of their therapeutic achievements. The alkaline citrates and acetates, the volatile oils, sweet spirits of nitre and a few more have drifted down to us through centuries of dogmatic teaching and clinical credulity, scarcely able to hold their ground even in students' textbooks. On the other hand, the value of water as a diuretic has never been disputed; WITHERING's classical observations on the action of foxglove in dropsy have received universal acknowledgment; the increased output of urine after taking alcohol and beverages containing caffeine cannot be accounted for in terms of fluid intake alone; and mercury in the form of grey powder or calomel is cardiac of inducing profuse diuresis in cases of capable œdema. Ever since its recommendation as a diuretic by PARACELSUS in the 16th century mercury has enjoyed a considerable reputation in the treatment of dropsy. STOKES in his "Diseases of the Heart and Aorta" (1854) wrote: "It happens again and again that the exhibition of mercury will, as by enchantment, remove the anasarca." On the other hand, most clinicians today, while admitting their experience of dramatic results from inorganic mercury, would add that the action is unreliable and capricious. There is still no unanimity on the mechanism of this action, but the majority vote now favours a direct action on the kidney, reducing tubular reabsorption of water. On this view, as GOODMAN and GILMAN[1] put it, the action represents a very early stage of the toxic action of mercury on the kidney, though there is no suggestion that the mercurial diuretics cause any permanent kidney damage.

Four hundred years had to elapse before any substantial progress could be reported in the therapeutic application of mercury as a diuretic, and even then, as so often happens, the advance was attributable to accident rather than design. Working on organic mercurials for the treatment of syphilis, ZIEGLER[2] in 1917 employed the compound 'Novasurol,' but it was SAXL[3] three years later who called attention to the remarkable diuretic properties of this substance. The occasional poisonous effects of novasurol stimulated the search for non-toxic organic mercurials, and during the past quarter of a century therapeutics has been enriched by the addition of a number of preparations highly effective as diuretics but having a very low toxicity. In a comprehensive review of the organic mercurial diuretics five years ago THOMSON,[4] at the cardiac department of the London Hospital, found that after the intravenous injection of 2 c cm of mersalyl (*BP*), its proprietary equivalent 'Salyrgan' (Bayer), 'Neptal' (M&B) or 'Novurit' (Mdale), the average 24-hour output of urine was in the region of 3000 c cm. The effectiveness of novurit suppositories was about 80% of that of organic mercury injected intravenously. The simultaneous administration of digitalis did not enhance the value of these diuretics, but there was almost invariably a greater output if ammonium chloride was given before the mercurial. THOMSON maintained that "the mercurial diuretics should take precedence even over digitalis where œdema is the prominent feature in congestive failure. Hydrothorax or ascites will respond to these preparations, which should make the use of paracentesis, skin puncture, or Southey's tubes a rare necessity. Where there is cardiac asthma, orthopnœa, and enlargement of the liver—yet without external œdema—they should be used; and for incipient heart-failure they find a place with digitalis in preventing the onset or recurrence of œdema."

EVANS and PAXON,[5] also working at the London Hospital, have pursued this research further and have compared the diuretic potency of 'Esidrone' (Ciba), mersalyl, neptal and salyrgan, when given intravenously or intramuscularly. (These preparations all contain various amounts of theophylline, intended, says the BP[6], to inhibit the decomposition of the mercurial complex, but presumably enhancing its action as well.) Esidrone apparently came out best in this test, followed by neptal, salyrgan and mersalyl, but it is doubtful whether enough patients were tested to justify conclusions on relative efficiency. Intravenous injection was considered decidedly more effective than intramuscular, and was preferred nd that individuals may vary in this respect Meat xtracts have had a great reputation in the past as estoratives, Parkes, the military hygienist, believed particularly in them They certainly stimulate the gastric mucosa, and so may promote digestion in a man who feels too tired to eat Emergency rations, usually n the form of chocolate, or compressed meat mixed with at, act as handy fuel On the whole however diet seems to have no specific influence on performance except of course that it must be adequate if fitness is to be maintained Agents reputed to increase performance by a direct action on muscle itself or on muscle metabolism are gelatin, glycine, vitamins alkalis and phosphates, but evidence of their value is equivocal Two years ago Morell[2] in Berlin demonstrated to his own satisfaction that energy output as measured on a fixed bicycle, could be increased by giving tablets containing dextrose, vitamins C and B_1, and compounds of nicotinamide, and he recommended their administration to airmen and others called on to make long-sustained efforts, but his experiments were uncontrolled It is agreed that additional sodium chloride benefits those who have to work in great heat Drugs have achieved some success in the psychic field thus alcohol, caffeine and amphetamine ('Benzedrine') all have their place but regular doping with any of these drugs is not to be recommended Alcohol should be classed as an emergency remedy, improving staying power and removing awareness of fatigue even if it does not increase muscular work At one time oarsmen always took sherry just before a race, a small dose of alcohol taken immediately before exercise in this way has been shown to produce a temporary increase in work, followed later by a drop in performance lasting several hours A larger quantity taken about half an hour before the test caused a diminished output of work from the start of activity Caffeine, besides delaying the onset of fatigue and increasing work output, has a considerable psychic effect, the cup of strong sweet tea given to the tired soldier is no mean restorative Benzedrine produces euphoria wakefulness and mental stimulation Natives in Bolivia and Peru chew coca leaves to ward off hunger (a local effect on the gastric mucosa) and to increase endurance (an effect of central stimulation), presumably some of them become addicts Leptazol acts on the vasomotor and respiratory centres, producing a transient increase in power and delaying the onset of fatigue Where a group of men are to be hardened, the best physical and mental performance is likely to be achieved if causes of constant pain or discomfort are removed (many will testify to the fatigue produced by persistent indigestion, for example), if general physical fitness is improved by regular training, and if they are given the chance to endure periods of hardship If men are used to roughing it, it does not occur to them to find it tiring

---

[1] Goodman L and Gilman A Pharmacological Basis of Therapeutics New York 1941 p 601

[2] Ziegler K *Munch med Wschr* 1917 64 1257

[3] Saxl P *Wien klin Wschr* 1920, 33 179

[4] Thomson, W A R *Quart J Med* 1937, 30, 321

[5] Evans W and Paxon T *Brit Heart J* 1941 3, 112

[6] Addendum 1936, p 47

CLEAVAGE LINES

THAT some incisions leave almost invisible scars while others become broadened and even develop keloid is an old observation, the most important factor influencing the result is the relation of the incision to the tension or cleavage lines of the skin[3] Dupuytren in 1834, first pointed out that a wound made with a circular instrument does not remain circular, but becomes almost linear (a point of medicolegal importance) Other workers (notably Langer in 1861) studied the disposition of lines in the skin, and Kocher, in 1892 stressed their surgical significance Cox[4] has lately elaborated the observations of Dupuytren, and working on the cadaver has made a complete series of such punctures, thus charting the whole body In the main the charts resemble those of Langer, with notable exceptions on the back of the thigh, front and back of the arm, sole of the foot, and in the groin Langer classified his according to age but Cox finds a closer relation to body build with variations in the upper extremity in people of similar build The line pattern remains unaltered in excised skin and is therefore intrinsic in the skin Microscopical sections show that the essential factor is the disposition of the elastic and connective tissue fibres running parallel to the cleavage lines in the subcutaneous tissue Skin retraction is minimal in incisions following the lines and scar formation is consequently less A study of these charts shows at once why longitudinal incisions behind the knee or in front of the wrist are better avoided and that the common oblique inguinal or appendicectomy incisions should be placed more transversely Where an incision must cross the natural skin creases Levitt and Gillies (see p 440) advise prophylactic radiotherapy Cleavage lines usually follow crease lines, the flexor aspect of the elbow being a notable exception.

VITAMINS IN OPHTHALMOLOGY

THE differentiation and synthetic preparation of the multitude of vitamin B components have been accompanied by regular relays of progress in clinical research and the eye has not escaped Métivier,[1] working in Trinidad, holds that some forms of failure of vision in tropical countries constitute a clinical picture which he designates as tropical nutritional amblyopia It corresponds closely to the toxic amblyopias seen elsewhere and appears to be due to deficiency of vitamin B_2 In some of his cases there was an associated epithelial dystrophy of the cornea, which does not seem to correspond with conditions in Europe known under that name and Métivier holds that this is a characteristic lesion in B_2 deficiency Vitamin B_2 looms rather large in recent discussions on amblyopia Johnson[2] among others found it effective in rosacea keratitis, while in tobacco amblyopia he and other observers, such as Gottlieb,[3] have incriminated lack of vitamin B_1 Lately attention has been drawn[1] to conjunctival bleeding as a manifestation of hæmorrhagic disease of the newborn arising from deficiency of vitamin K But there is still much confusion over the significance of vitamins in eye disease Even in such a relatively well established entity as Bitot's spots there appears to be uncertainty whether all cases represent vitamin A deficiency

RUNNERS EXAMINE THE COURSE

THE Scottish National Union of Students has drawn up a report on medical education for the BMA Planning Commission, representing the opinion of the four university medical schools—Aberdeen, Edinburgh, Glasgow and St Andrews When anybody sits down to consider his own situation he can generally put an accurate finger on the defects but is also, perhaps, inclined to undervalue the assets, looking back on a past situation we gain perspective but also lose appreciation of detail, so that student opinion contributes something to the study of medical education which cannot be derived from any other source The Scottish students have had two points clearly in their minds that the medical course should form an integral whole, each subject being properly orientated in relation to the rest, and that the primary aim should be to turn out competent general practitioners Their proposals for reform of the premedical course are much the same as those advocated last year at the meeting of the NUS at Cambridge[4] they would like the formal courses in zoology and botany to be replaced by a more general course in biology, laying emphasis on the principles of evolution, heredity and development rather than on details of structure in examples of selected phyla They feel that all necessary inorganic chemistry and physics could be learned at school and that at the university

---

[2] Morell, T *Dtsch med Wschr* 1940 66 398
[3] See *Lancet* 1941 i, 422
[4] Cox H T *Brit J Surg* 1941 29 234

[1] Métivier, V M *Amer J Ophthal* 1941, 24 1029 and 1265
[2] Johnson L V *Ibid* 1941 41 1233
[3] Gottlieb B *Brit J Ophthal* 1941 25 556
[4] See *Lancet* 1941 i 489

Annotations

HOUSEWIVES ON FOOD

MASS-OBSERVATION have taken the opinion of housewives on the food situation this spring and compared it with opinions given on the same subject this time last year. They find that 77% of their sample think the position good on the whole, 13% consider it fair and 7% are dissatisfied; the answers of the remaining 3% could not be classified. The points system of rationing tinned foods and fruit has been welcome. Some of the foods lacking last spring have been plentiful this year—for example, in 1941, 59% of women mentioned the cheese shortage, whereas it was scarcely mentioned in 1942. In 1942 the commonest grumble is about the lack of cakes, but only 23% of women mentioned it—well under half the number who felt so strongly about cheese last year. There has been less grumbling, too, about marmalade, onions, tinned foods, dried fruit and syrups; the change here can be put down to more certain and equitable distribution and to the points system. Fresh vegetables and fruit have become scarcer since last year and they hold a higher position on the grumbler list in consequence. Some resent the high price of fish and complain that in order to get any they have to turn up early at the fishmonger's. Salted cod does not yet seem to be a universal taste. Grumbles about eggs have fallen off in spite of the greater shortage. People realise that though eggs are few those available are fairly distributed; their chief complaints have been about bad eggs. Milk, on the other hand, they feel is unequally shared; some of those who live near the end of a milk round do unusually well because the milkman at that stage can use his discretion. On the whole, however, grumbles about specific foodstuffs have fallen off greatly since 1941 and queues seem to be less common than they were. The most regular queues are for confectionery and tobacco—which looks as though people are getting necessities in comfort, and are prepared to take a little extra trouble to get luxuries.

MINOR PSYCHIATRY IN GENERAL MEDICINE

A TASK of moment for constructive planners is to ensure more general and competent teaching of psychological medicine. The failure of medical recruitment boards to weed out a large number of the mentally unfit from among applicants, and the delay which is usual before such men are recognised and discharged from the Forces, as well as the shortage of trained psychiatrists, all show that psychiatry has not yet been given an adequate place in medical education. Improved teaching does not mean that the student should spend more hours in visiting mental hospitals to see the inmates demonstrated like freaks in a circus—the only psychiatric instruction still provided in many famous schools. What is sometimes called minor psychiatry—border line cases, neurotics and those with psychopathic personalities—are of far greater interest to the future general practitioner. It is even more essential that he should realise how closely psychological factors are woven into the causative nexus of many ordinary conditions. This was brought out well in a lecture given last year by Fanconi,[1] professor of pædiatrics at the University of Zurich—itself one of the nurseries of modern psychiatry and psychotherapy. That a teacher who is not a psychiatrist should try to bridge the gap between psychological and general medicine is itself significant; the indifference shown by teachers in other branches of medicine has seriously obstructed the student in appreciating the psychological factors in disease. Such factors, it is true, often spoil the scientific picture, and many teachers are content to leave them out for the sake of clearness when presenting the physical aspects of an illness. Fanconi began his lecture by demonstrating a typical case of rheumatic arthritis with endocarditis in a child of 6, and comparing it with a case of acrodynia (vegetative neurosis) in a child of 7½. Joint pains were present in both, but the child with acrodynia showed in addition tremor, listlessness, hypotonia and the characteristic photophobia, rapid pulse-rate, flushed extremities and rash of pink disease. A third child, aged 3½, was shown, in whom tremor, night sweats, and disturbances of sleep might have suggested pink disease; but she was, in fact, an only child mismanaged by a nervous mother, and all her symptoms were referable to that misfortune. From these and similar cases Fanconi developed a scheme showing how physical, functional, psychological and environmental factors overlap in the production of a disease picture. It is especially difficult to establish the psychological factors operating in children; Fanconi's hints to students were based on common sense and clinical experience, but they were just the things which are often left unsaid because they seem so obvious. There is, of course, a danger that the student introduced to the elements of psychiatry will be tempted by those attractive solutions of almost any human problem which are offered by some psychotherapeutic schools. It calls for experience and critical judgment on the part of the teacher if psychiatry is to be given its appropriate place—no more, no less—in medicine. Fanconi treats Freud's doctrine as a metaphorical pattern, and indicates the scope and the limitations of psycho analytical interpretation when applied to biological events. Diagnosis must depend on both somatic and psychological investigation, as he illustrates from case histories. Psychology, he believes, can be better taught on the single case than in theoretical lectures.

FATIGUE

DEFINITIONS of fatigue are misleading because the subject's own opinion plays such a large part in the symptoms. The term is commonly used to denote a diminished capacity for doing effective work as a result of previous activity; but what actually causes the capacity to diminish? A man may feel tired because he considers he has done enough. The psychic component often overshadows the physiological component, and stimulants may act by removing the sensation of weariness without changing the physiological state. Hellebrandt and Karpovich[1] have surveyed the methods commonly used to improve physical performance in man, and find they can be roughly grouped as measures which delay exhaustion, hasten recuperation or dull awareness of fatigue. Of those which delay exhaustion the most important seem to be nutritional, whereas (except for sugar and salt) drugs are the chief agents in the other two groups. Rest, oddly enough, is not mentioned as a cure for fatigue, though the psychical and physiological benefits of rest pauses in factories are well known. Hellebrandt and Karpovich, however, are concerned chiefly with troops exposed to strains in which no pausing is allowed. Evidence about the effects of diet on physical performance is conflicting. Various classes of heavy workers, such as lumbermen, eat a great deal of fat, though it has been shown that work pushed to the pitch of exhaustion can be sustained longer on carbohydrate. But after all, the balance of a diet containing even as much as 40% of fat must be made up of carbohydrate and protein (which is readily convertible to carbohydrate). Sugar is thought to produce immediate benefit in exhaustion by relieving the effects of incipient hypoglycæmia on the brain. The authors of the survey find no conclusive evidence that glucose is used by the body immediately, or has any prompt effect in states short of hypoglycæmia, and hypoglycæmia they consider is only induced after long and exhausting exercise. It is possible, however, that hypoglycæmia is not so difficult to achieve as they suggest,

---

[1] Fanconi, G. *Schweiz. med. Wschr.* 1941, 71, 1465, 1489.

[1] Hellebrandt, F. A. and Karpovich, P. V. *War Med.* 1941, 1, 745.

Special Articles

HOME-LIFE OF THE BED-BUG

J. R. BUSVINE, PH.D., B.SC. LOND.

(London School of Hygiene and Tropical Medicine)

TODAY, when we have witnessed some of the terrors of civilisation at war, we are inclined to forget its comforts and advantages. One benefit is the comparative freedom from parasites of civilised man. Attacks of body lice and fleas, the normal lot of more primitive societies, have become rare in civilised temperate countries. Some forms of vermin however, such as the bed-bug, the head-louse and the itch-mite, are still disturbingly prevalent. Recent applied biological researches have given us improved methods of dealing with these species which will drastically reduce them if seriously applied.

This type of research draws constantly, if sometimes unconsciously, on physiological and ecological data, but in spite of the great number of papers on the bug, our knowledge of those aspects a few years ago was very deficient. This was pointed out in 1934 by the committee on the eradication of bed-bugs set up by the Ministry of Health. At that time Dr. C. G. Johnson undertook a study of these problems and has now published a complete account of five years' work.[1] Most of the recent papers on the ecology of the bed-bug have been German (Hase, Kemper, Titschack, Janisch and Geisthardt) and it is gratifying to see them surpassed by the work of English biologists (Johnson and Mellanby).

Johnson's aim was to find out how the environmental conditions of a bedroom in Britain can affect bed-bug infestations if no special measures are taken against them. Thus stated the problem sounds simple, but Johnson's report will remove that impression. It runs into 116 pages with 59 tables and 39 figures and he calls it a "brief and very incomplete survey of the operation of some of the main factors in the biology of bed-bug populations." It is evident that the ecology of a free-living bug infestation is obscure and complex and its operation must be inferred by piecing together results of laboratory studies and observations of wild populations.

LABORATORY STUDIES

The earliest, uncritical, observations of natural infestations gave such conflicting results that this method was discredited and the field was almost entirely abandoned for the laboratory. This went so far that one got the impression that cimex was an insect normally occurring in glass vials in an incubator, and only rarely found on a bedroom wall. Biologists had lost sight of natural conditions and (for reasons of technical convenience) worked at unnaturally high temperatures. Johnson, however, obtained temperature records of unheated and heated bedrooms throughout the year in London and planned his laboratory experiments accordingly.

Even the best planned laboratory experiments are unavoidably artificial. Following the usual scientific plan of varying one condition at a time and observing the results, their aim is to show the relative importance of various environmental conditions on speed of development and on reproduction. With these data we can estimate the *potentialities* of bug populations, neglecting the vagaries of bug behaviour in a natural infestation, not to mention such cataclysms as spring cleaning or fumigation.

By far the most important factor in bug ecology is temperature. Lacking the constant regulated metabolism of vertebrates the whole tempo of bug life is set by the weather. The egg stage is scarcely dependent on anything else; over a considerable range the speed of incubation is directly proportional to the temperature. At the upper (> 32° C.) and lower (< 13° C.) parts of the curve, where the relationship fails, a greatly increased mortality is an indication of unfavourable conditions. In the blood-sucking stages, food-supply is of course essential; but assuming a host to be usually accessible at night the frequency of feeding itself depends on the temperature.

During its development the bug must take one full meal of blood in each nymphal stage before it can moult to the next. The time spent in digesting (from meal to moult) at different temperatures can be easily found by laboratory studies. Another period that can be measured is the interval between the first feed as an adult and the commencement of egg laying. The time between the moult and the next meal is less certain; it depends on how soon the bug decides to go in search of food. All that can be done is to find out how soon after moulting a bug will feed if placed on the host, and make an estimate from this.

We are now in a position to estimate the mean periods at different temperatures from oviposition in one generation to oviposition in the next. These are made up as in table I (from table 8 in Johnson's paper).

TABLE I—RATE OF DEVELOPMENT ACCORDING TO TEMPERATURE

°C	°F	Duration of egg stage (days)	Sum of periods feed moult for 5 nymphal instars * (days)	Period feed first egg in adult (days)	Sum of estimated periods moult feed (days)	Total (days)
28	82.4	5.5	14	2.7	12	34.2
25	77	7.1	24	2.9	12	46
23	73.4	9.2	29	5.4	18	61.6
18	64.4	20.2	66	9–12	30	125.2
15	59	34	119	23.7	60	236.7

* An instar is a stage in the life history of an insect between two successive castings of the cuticle.

Within a certain range (say 16–30° C.) temperature merely affects the speed of the bugs' development. Outside this range it causes considerable mortality. Janisch found that continuously high temperatures slightly above the optimum range caused mortality and finally sterility in a culture. Johnson shows that at temperatures of 15° C. (59° F.) and below there is a high egg mortality and also a great reduction in the number of nymphs which can moult successfully. This is of great practical importance, for the temperature in an unheated bedroom falls below 15° C. for several months in winter and the result is a hibernation period with complete cessation of growth and breeding.

Apart from temperature the other vitally important matter to the bed-bug is food-supply. Perhaps its greatest effect is on the egg production of the adult. This is most obvious if the bugs only obtain incomplete meals—that is, if they are disturbed while feeding. The meals of bugs that feed to repletion are correlated with the weight of the bugs and the egg production is also related to this. Apart from the size of each meal, the frequency of feeding naturally affects egg production. At 23° C., if the bugs are fed at 10–15 day intervals, there is a latent period and then a batch of about 8 eggs laid over 2–3 days. With more frequent feeding the latent period is reduced, and finally, with two feeds a week, egg laying is almost continuous. The frequency of feeding in nature is uncertain. According to indirect evidence, Mellanby estimated that it must occur about once a week in a warm infested animal-house.

TABLE II—EFFECT OF TEMPERATURE AND HUMIDITY ON SURVIVAL DURING STARVATION

°C	% RH	Length of life (days) of adult bugs fed once on rabbit			
		Male (mated)		Female (mated)	
		Mean	Maximum	Mean	Maximum
7	10	208	291	228	306
	90	219	382	286	461
13	10	187	256	179	235
	90	338	464	360	562
18	10	97	148	91	139
	90	151	257	143	222
23	10	40	57	38	67
	90	85	135 (unmated)	69	126 (unmated)
7	90	223	518	317	550
23	90	87	126	121	181

Humidity plays a minor rôle in bug ecology. Its effects on development and reproduction are smallest when other factors (food and temperature) are optimum. Under adverse temperature conditions (cold or heat) the student should study only organic chemistry and applied physics taught with regard to their bearing on electrotherapeutics, radiology and optics. In the same way they would like to see anatomy and physiology taught as interdependent subjects. In order that the student may realise that he is studying the normal standard, against which he must later measure abnormal findings, the report advocates occasional clinical demonstrations during this part of the course. This plan has already been tried successfully at Glasgow, the cases demonstrated being such as could be diagnosed by a knowledge of structure and function alone. It is also suggested that radiograms should be used freely in the study of anatomy, so that the student will become familiar with normal radiological appearances, that embryology and surface anatomy should be adequately taught, and that the study of normal function should include normal psychology—all sound constructive proposals. In the clinical years the students would like to see the teaching of pathology and materia medica linked up with the course in systematic medicine. They ask, too, that they should have the opportunity to follow up the post-mortem findings in fatal cases which they have seen in the wards—an opportunity which is already provided in some English schools. A plea for smaller numbers of students at clinics, for more lecture demonstrations, and for the chance to carry out common nursing measures and minor medical and surgical procedures is timely, so are the proposals that a prospective doctor should have undergraduate experience of general practice and that his training in midwifery should include the conduct of abnormal as well as normal cases: common sense demands that he should have such experience as a minimum before he is licensed to deal single-handed with an obstetric emergency. Less comprehensible is the suggestion that the teaching in public health should be reduced while that in the sociological relations of medicine should be extended: it is a reflection on the current teaching of public health that a well-informed body of students do not recognise these as being two names for the same thing. The Scottish students also wish for more clinical tutors whose main function shall be teaching—a wish rarely, it seems, expressed in the London schools. It is doubtful whether, in the long run, the man whose main function is teaching remains as stirring a teacher as the man who, racing to keep at the growing point of his subject, shies a golden apple at his students and hurries on. But much depends on the conscientious fulfilment of the obligation to teach.

---

[1] *J. Hyg., Camb.* 1942, 61, 345.

CAT-BITES AND HUMAN BITES

BITES from domestic animals seem often to go septic and are slow to heal. Nothing much is known about the bacteriology of these infections, of which Allin[1] has lately described three cases. Rimpau[2] in 1937 reported three cases in which local abscess formation with or without adenitis followed bites by healthy cats; from two of these wounds and from the respiratory tract of both healthy and diseased cats Kremsreiter[3] isolated hæmoglobinophilic bacteria. However, H. Schenk (quoted by Allin), in a study of pasteurella, found this organism in the air passages of 15 out of 20 cats and recovered a similar organism in the pus from 4 cases of cat-bite infection. His organism was not only morphologically and culturally identical with *Pasteurella septica* but also produced the typical septicæmia in rabbits and mice. Allin's first case developed a local abscess on the volar aspect of the wrist a few days after the cat bite; the wound was excised and healed without incident. But 11 months later pain and swelling developed on the dorsal surface of the wrist, and a subperiosteal abscess with osteomyelitis of the lower end of the radius was discovered. The necrotic tissue was removed, the cavity was packed with bipp and the wound healed uneventfully. In the second case, the hand of the victim was swollen and painful when seen 7 hours after the cat bite but the infection subsided with local treatment. A third case became acutely ill with enlarged axillary glands after a bite on the finger, and three months later the axillary glands suppurated. From the first two cases a pasteurella was isolated which was rapidly lethal to rabbits, mice and guineapigs. No bacteriology was done on the third case and unfortunately the sera of the other two cases were not examined for specific antibodies. Pasteurellosis of the septicæmic type, and also the more chronic pseudotuberculosis, is not uncommon among animals; it is now coming to be regarded as primarily a respiratory infection, and the organism has been found in the mouth and nasopharynx of a number of animals including cats, rabbits and swine. It has hitherto been doubtful whether infection with pasteurella, apart from plague, can occur in man, but these observations of Allin and others should stimulate a more careful bacteriological study of infected animal bites.

When man bites man the patient rarely seeks medical advice, and if he does is apt to conceal the true story. It is not generally realised how dangerous such bites can be, nor that a wound over a knuckle in a bare-fist fight or drunken brawl should be classed and treated as a human bite. Sucking hangnails also carries danger. Miller and Winfield[4] have drawn attention to the important work of Mason and Koch[5] from Kanavel's school, and have reported 61 cases of their own. They point out that such wounds readily become infected and the infection tends to extend and invade deeper structures and to become foul smelling, necrotic and resistant to treatment. Vincent's organisms, streptococci and staphylococci, the colon bacillus, various fungi, and even *Spirochæta pallida* may be found. The wounds are usually situated on the dorsum of the hands, and often over the metacarpophalangeal joints, where a thin tendon alone intervenes between the skin and the joint itself. The act of opening and closing the fist immediately tends to spread any infection. Primary suture must never be performed, and excision and suture or cauterisation are not satisfactory. The correct treatment is to wash the part generally with soap and water for 5 minutes, then irrigate the wound gently with saline for 10 minutes. No probing is done but the edges are gently retracted to determine the extent of the damage and after very limited debridement wet dressings are applied with the hand in the position of function. No sutures are used in the skin or damaged deeper structures. Many cases first appear when infection is well established. The treatment then follows the usual lines, but it must be appreciated that one is faced with a very dangerous type of infection, that extensive suppuration and tissue loss may occur, and that slow healing and recrudescences of infection are to be expected. There must be no hesitation in opening up the metacarpophalangeal joint by transverse incision if this is involved.

---

[1] Allin, A. E. *Canad. med. Ass. J.* 1942, 46, 48.
[2] Rimpau, W. *Münch. med. Wschr.* 1937, 11, 413.
[3] Kremsreiter, *Arch. Hyg., Berl.* 1937, 118, 2.
[4] Miller, H. and Winfield, J. M. *Surg. Gyn. Obstet.* 1930, 74, 153.
[5] Mason, M. L. and Koch, S. L. *Ibid*, 1930, 51, 591.

THE ANTI-DIPHTHERIA CAMPAIGN.—At a recent press conference in Edinburgh were presented the results of the campaign launched some 15 month ago to promote immunisation against diphtheria in Scotland. About 53% of pre-school children between the ages of 1 and 4 and 70% of school children have been immunised, being some 65% of the population between the ages of 1 and 14. In a consecutive series it was found that 6886 cases of diphtheria occurred in non-immunised children and 959 in immunised children. The fatality among non-immunised children was 5·9%, among immunised children less than 1%. Local authorities varied in the success they achieved but the combined results demonstrate the energy with which the campaign has been pursued. The proportion of children in the community already immunised should be sufficient to reduce the incidence of diphtheria in Scotland.

cases the effusion has followed a clinically insignificant primary complex and is not the first lesion of primary tuberculosis Similarly, foci of bronchogenic tuberculosis may develop among both groups, but the interval after the change in tuberculin reaction is again longer in the group among whom the bronchogenic tuberculosis is apparently the first clinical manifestation Dr Kayne pointed out that few relevant observations have been published in England, but the low incidence of infection at adolescence in so many countries and the falling incidence of infection, justifies speculation Since primary tuberculosis at any age tends to weed out the most susceptible individuals, among whom it proves fatal, a falling incidence of infection in childhood must result in an increasing proportion of susceptible people being infected in adolescence and adult life with a corresponding rise in fatal disseminated forms at those age-periods Dr Kayne showed how this phenomenon may at least in part account for three epidemiological observations—the generally low mortality from tuberculosis in later childhood, the retardation in fall of tuberculosis mortality among young women since 1900, and the large increase in tuberculous meningitis since the beginning of this war in the young adult group He maintained that in planning the control of tuberculosis discussions on the relative importance of endogenous or exogenous reinfection are largely academic When there are many uninfected adolescents, and when bronchogenic tuberculosis may follow soon after the primary infection exogenous infection as a cause of bronchogenic tuberculosis plays an essential role in one way or the other Thus both contact and lowered resistance are of decisive importance in prevention

In the subsequent discussion, Prof LYLE CUMMINS and Dr V S HODSON referred to the malignant form taken by primary tuberculosis in primitive races, but even in connexion with them environmental conditions play an important part in the course of the disease Dr F A H SIMMONDS referred to personal experiences in regard to incidence of infection and primary tuberculosis among nurses Mr R N J INNES related observations on primary tuberculosis in animals Surgeon Rear-Admiral SHELDON DUDLEY commented on the fact that in spite of the energetic measures taken to detect and treat tuberculosis in the Navy the incidence of the disease has not fallen primary tuberculosis may be responsible for this Two other points emerged from the discussion—the crying need for field investigations involving tuberculin surveys in this country and the importance in the control of tuberculosis of keeping up the resistance of all adolescents and young adults by attending to their living and working conditions

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED MARCH 21

Notifications—The following cases of infectious disease were notified during the week smallpox, 0, scarlet fever, 1296; whooping-cough 1553, diphtheria 900, paratyphoid, 13, typhoid, 7, measles (excluding rubella), 2980, pneumonia (primary or influenzal) 1567, puerperal pyrexia, 175, cerebrospinal fever, 281, poliomyelitis, 4, *polio-encephalitis*, 2, encephalitis lethargica, 3, dysentery, 146, ophthalmia neonatorum, 94 No case of cholera, plague or typhus fever was notified during the week.

The number of civilian and service sick in the Infectious Hospitals of the London County Council on March 18 was 1462, including scarlet fever 136 diphtheria, 219 measles 93 whooping-cough, 478 enteritis 77 chicken pox 52 erysipelas 35 mumps 73 poliomyelitis 1 dysentery, 25 cerebrospinal fever 33, puerperal sepsis 25 enteric fevers 8 german measles 4, encephalitis lethargica 1, other diseases (non infectious), 124 not yet diagnosed 85

Deaths—In 126 great towns there was 1 (0) death from an enteric fever 2 (0) from scarlet fever, 5 (1) from measles, 7 (4) from whooping-cough, 15 (0) from diphtheria, 38 (6) from diarrhœa and enteritis under 2 years, and 66 (9) from influenza The figures in parentheses are those for London itself

Birmingham reported 1 death from an enteric fever

The number of stillbirths notified during the week was 239 (corresponding to a rate of 35 per thousand total [illegible] including 28 in London

In England Now

A Running Commentary by Peripatetic Correspondents

MOST MOs of destroyers on appointment have visions of long hours of leisure enabling them to study and to read all that has been unread This high ideal remains a high ideal—the ocean swell takes away both the desire and the performance. Yet time does not pass slowly In rough weather a profound lethargy whiles away the hours In gales the philosopher may ponder over the teleological importance of his vomiting, and he may wonder if a physician who prays for a merciful release for himself in death is at his best to elicit the physical signs of early pneumonic consolidation from a patient, at one minute swung eight feet away at the next flooring his examiner (Any hints by the way, on the use of the bed-pan in these circumstances acceptable) In fine weather the philosopher can reappear and like Aristotle observe both men and beasts There are a few minutes to be spent in the not-so-sick parade then a whole day for thoughts and birds and beasts In Darwin's view fulmar petrels are the most numerous of birds, and certainly to an erstwhile landlubber it is a revelation to find such quantities of birds at sea Our observer identifies each species—shearwater, kittiwake or auk—and loyally counts each fulmar for the British Ornithological Society (His offers to navigate and find the ship's position by the birds around are treated with merited ridicule) It is a source of pride to know how many oceanic species have been described and called after ships' surgeons There are the migrants to be helped on their way One busy day, the first lieutenant lay sick from catarrhal jaundice a redshank from exposure and a starling from the mental shock of finding itself five hundred miles from land Forced feeding of gin and lime killed the starling, despite warmth and rectal salines the redshank was just unable to fly the hundred yards to the shore, but, too comatose at one time to object to the redshank perching on his nose the first lieutenant still survives When darkness falls there is the first-aid class to be instructed A dead eider duck found floating nearby, dissected with the aid of Macgillivray's British Birds, provided knowledge to both teacher and taught. Its stomach with the mussel shells contained therein fill our "gastrics" with longing Finally the brief day of philosophic pose and omniscience comes to an end The sea-lawyer of the crew as innocently as ever asks if all animals drink fresh water On being firmly answered "yes" the discussion is turned to the cetacea

* * *

Having been brought up as a naturalist, I am not deceived when my chief stops at the end of a bed and in dulcet voice says to the patient "Now tell me all about the start of your trouble Ah, yes . Just so Ah, yes"; for I note his eagle eye is fixed on the front page of the *Daily* ——, which he is not privileged to read at home, especially I guess, on 'Burglar Bites Inspector' and "Imminent Naval Battle" neither of which is mentioned in the *Times* Yet there is no insincerity about it, the fact is, man's receiving apparatus (having been so much longer in use?) is ten times quicker than his transmitting, and his mind, like a dog on a walk, scours the country while Old Words who thinks he's master plods along behind

In OPs a nurse is getting the things ready for me to take off an old-fashioned plaster from a child's leg—a sultry job On her arm are a number of red and blue stripes "I'm not going to hurt you, Sonny Tell me if you feel anything" Of course, I read that MOH circular (2601 of March 16) · "The Minister of Health has decided to institute new awards for members of the Civil Nursing Reserve' Like Royalty Stars for nursing auxiliaries and assistant nurses stripes for trained nurses One red one for each year's general service, and from now on a blue one for each year's hospital work if it includes at least three months in a sanatorium tuberculosis ward or hospital, or a fever hospital I wonder what a trade union would say if a political head started making awards to its members! And why should sanatorium work be classed as dangerous? Some of the big sanatoria have never had a case of there is less egg mortality at a high humidity (about 90% RH) than at a low one (7% RH). The influence of humidity is most pronounced during starvation, when the high humidity again is much more favourable. Survival during starvation is also greatly influenced by temperature, and the two combine as in table II (from Johnson's table 11).

These figures are for bugs resting quietly in tubes in the dark. In a natural infestation they wander about even at surprisingly low temperatures (9° C.) and this movement uses up the food reserves. Consequently the laboratory data are seldom attained by wild bugs.

OBSERVATIONS IN THE FIELD

Turning from laboratory studies to naturalistic experiments we find some interesting results from artificial infestation of small sheds with and without animal host present. Periodical examinations of the populations revealed the appearance of the different stages at about the times to be expected from the temperature records. That is to say, the development rate in the field agrees with laboratory indications. On the other hand there was a surprisingly high mortality among the released bugs whether a host was present or not. This was undoubtedly due to their very considerable activity exhausting their food reserves. Observations on the numbers of bugs caught in traps or changing position from day to day provided information about this wandering. The amount of movement was usually well correlated with mean daily temperature and was greater if a host was present than if the host were absent. Records made by Mellanby at different intervals throughout the 24 hours showed a well-defined peak at dawn.

Naturalistic experiments, however, cannot give a final answer to the natural ecology of bug infestations in bedrooms. Johnson has made some detailed calculations of probable population growth in two London bedrooms based on their temperature records. These are entirely theoretical but they are interesting because they show how greatly the bed-bug is favoured by warming its habitat slightly during the winter. In an unheated room the temperature drops below the hatching and development threshold (about 13° C.) for several months. During this period, growth and development stops and moreover the insects seem to be deterred from feeding by low temperatures at which they still wander about. Consequently there is a considerable mortality during the winter especially of the more susceptible younger instars.

According to Johnson's calculations a spring population of 40 adults in an unheated house might produce 950 sucking insects by the autumn. Then during the winter reproduction and growth would cease and mortality would reduce this population to some 60 adults and a few nymphs. On the other hand, bugs in a warmer room (e.g., a bed-sittingroom, heated in winter) go on feeding and breeding throughout the winter and the 40 bugs produce 3000 active progeny from March to February. At this time, there would be a large proportion of younger instars. Johnson gives details from some samples from London, Glasgow and from Ireland. It is interesting to find that the samples from heated bed-sittingrooms show a greater proportion of fertilised females early in the year and at the same time a greater proportion of young instars.

FUTURE RESEARCH

Johnson merely claims to have made a "start on what may be a promising investigation." Other subjects that require further investigation are listed at the end of his paper. Most of the data required must be sought in the field. Johnson has had to repeat a lot of laboratory tests because they had previously been done at abnormal temperatures but now the laboratory picture is practically complete.

A weakness in some of Johnson's naturalistic experiments is that animal hosts were used. It is true that physiologically the nutrient values of the different bloods is not so different. But the ease with which bugs can approach and suck blood depends on the habits and anatomy of the host. Moreover, many hosts eat large numbers of bugs and thus vitiate the results. Further work should as far as possible include observations of natural infestations in dwelling-houses.

As to the problems that require solution, we have only vague ideas on the population density which constitutes a real nuisance, of the proportions of a population which emerges per night, and of the proportion that successfully feeds. The question of how the bug finds its host is still unsolved and also we do not know how it returns to a hiding-place nor if it is usually the same one. The average and maximum distances a bug will travel to a host and subsequently return are also unknown. Above all there is the question of infestation of new premises and especially now of air-raid shelters. New work on these questions will be made easier by Johnson's excellent monograph.

PRIMARY TUBERCULOSIS IN ADULTS

THE Epidemiological section of the Royal Society of Medicine discussed primary tuberculosis in adolescents and adults at its meeting on March 27. In the opening papers, Dr. GREGORY KAYNE dealt with the historical, clinical and epidemiological aspects, and Dr. WALTER PAGEL provided a graphic morbid anatomical demonstration. Both speakers emphasised the importance of defining primary tuberculosis on a strictly pathological basis, as the first lesions produced when tubercle bacilli are first introduced into the body, whether by lung or intestine. Since these lesions may be so small or so situated that they do not show up in a radiogram, confusion will arise if, as has recently been done by some American writers, the first radiological manifestations are regarded as identical with the lesions of primary tuberculosis. Both Dr. Kayne (on the basis of clinical observations) and Dr. Pagel (on the basis of detailed post-mortem investigations) affirmed that in adolescents and adults, as in children, the first introduction of tubercle bacilli results in the formation of a primary complex. Unlike in children, however, in whom the hilar glands are always more extensively involved than the lung, in adults the hilar involvement may be greater or smaller in degree. Dr. Pagel found no structural differences in the hilar glands of non-tuberculous adults which would account for this. The subsequent course of primary tuberculosis is similar in children and adults in that both fatal and chronic dissemination may occur, but both speakers brought out one important difference. In the adult, but not in the child, primary infection may often be followed in a short time by bronchogenic tuberculosis (the common form of pulmonary tuberculosis that spreads by the bronchial system). Thus an adult with the typical clinical picture of bronchogenic tuberculosis may have been primarily infected within the previous two years or less. Dr. Kayne referred to the widely held belief, based on Naegeli's post-mortem findings and Pirquet's tuberculin surveys, that nearly everyone has been infected by the time adolescence is reached. This belief was exploded in 1927 when Heimbeck reported that a large proportion of student nurses in Oslo were in fact tuberculin negative. Many similar tuberculin and radiological studies, carried out over a period of years, have since appeared from Scandinavian countries, the United States, France, South America and elsewhere. Fresh morbid anatomical material has also been provided. Surveying these, Dr. Kayne concluded that while in towns as many as 80% of adolescents have already been infected, in most districts this percentage is no higher than 50 and even much lower, and that from then on primary infection in the general population takes place more or less gradually, with a maximum rate between 15 and 25 years; but among groups in contact with the disease—for instance, nurses and medical students—the rate is much more rapid.

In most adolescents and adults the primary infection is associated with no symptoms or signs and no radiological changes, but in some, with the change in tuberculin reaction, symptoms do occur. These may be erythema nodosum, fatigue and malaise, cough, pain in the side and gastrointestinal disturbance. Either with or without such symptoms radiological changes may be found, consisting of a typical primary complex or of hilar enlargement alone. Among both this group and the larger one without signs or symptoms pleural effusion commonly develops some months after the change in tuberculin reaction. But this interval is longer when the effusion arises *ab initio*, suggesting that in these

MEDICINE AND THE LAW

Hospital's Liability for Negligence of Staff

THE liability of a hospital for the alleged negligence of its technical staff was explored once again in the case of *Gold v. Essex County Council*, decided by Mr. Justice Tucker last January. A child was received at the Oldchurch County Hospital for treatment for warts on the face. The medical officer passed her to the radiology department with written instructions for her treatment, including the application of 1000 units of *grenz* rays. A radiographer gave this treatment several times, first protecting the patient's face with a screen of rubber lined with lead and placing a layer of lint underneath. One day the doctor ordered the units to be increased to 2000; on this occasion the radiographer omitted to use the lead and rubber screen, considering that the lint would be sufficient protection. Ulcers developed and caused permanent disfigurement. The plaintiff claimed damages against the county council on the ground of the negligence of the radiographer for whom the council were responsible; a further allegation was that the council were negligent in employing an incompetent technician. The judge found that the radiographer was negligent in omitting to use the same protection when 2000 units were applied as he had previously employed. There was evidence, however, that the radiographer was an excellent and trustworthy man in every way satisfactory. This disposed of the allegation that the council had been negligent in employing him. The question remained whether the hospital authority could be responsible for the negligence of its technician.

The English courts at present follow the well known ruling given by Lord Justice Kennedy in 1909 in *Hillyer v. St. Bartholomew's Hospital*. The governors of a public hospital, in admitting a patient to gratuitous treatment, undertake that the patient shall be treated only by experts, "whether surgeons, physicians or nurses," of whose professional competence the governors have taken reasonable care to assure themselves. But they do not make themselves liable in damages if members of the professional staff, being competent persons, act negligently in some matter of professional care, though, as Lord Justice Kennedy went on to say, it might be that the hospital would be legally responsible to patients for the due performance of its servant's "purely ministerial or administrative duties." The Hillyer case has been considered several times in recent years, in particular by Mr. Justice Swift in *James v. Probyn* (1935), Mr. Justice Horridge in *Strangways-Lesmere v. Clayton* (1936) and Mr. Justice Finlay in *Dryden v. Surrey County Council* (1936). All three judges followed Lord Justice Kennedy. Mr. Justice Swift observed that the duties of doctors and nurses are the duties of skilled people, to be carried out by skilled people; "the actions of doctors and nurses cannot be controlled, in my opinion, by members of a committee who do not for one moment pretend that they have the knowledge or ability to perform these duties themselves."

On the other side there is an opinion by Lord Alness in the Scottish case of *Lavelle v. Glasgow Royal Infirmary* (1932) where a patient was said to have suffered injuries through the negligence of a nurse. Lord Alness was unable to agree that the staff of a hospital when performing their professional duties can be in any different legal position from that which they occupy when performing ministerial or administrative duties. In the recent case of Gold Mr. Justice Tucker was pressed with the argument that the radiographer should be described as a technician, a man holding a position requiring skill and training, but none the less differing from an operating surgeon and approximating rather to the same category as a nurse. Hospital authorities, it was contended, ought to be responsible for the negligence of a nurse—at any rate outside the actual operating theatre.

In 1938 the Supreme Court of Canada reviewed the British cases exhaustively in *Sisters of St. Joseph v. Fleming* and decided in favour of the view of Lord Alness rather than that of Lord Justice Kennedy. It is worth noting that both Mr. Justice Swift in *James v. Probyn* and Mr. Justice Tucker in the recent Gold case confessed that the reasoning of Lord Alness was attractive. The Hillyer decision, however, was given by the Court of Appeal and the judges of the King's Bench Division hold themselves bound by it. The House of Lords, if occasion arose, could overrule it. The Hillyer decision was mentioned in the House of Lords in 1937 during the argument in *Lindsey County Council v. Marshall*. The supreme appellate tribunal decided against the hospital authority in the Marshall case but an effort was made to distinguish the case of Hillyer. Lord Chancellor Hailsham was careful to say that nothing in the Marshall case must be taken as throwing doubt on the Hillyer decision. And there, for the present, the matter stands.

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS, M.P.

THE announcement by the Lord President of the Council of the setting up of invasion committees affects every part of the country according to its vulnerability and importance, and the functioning of these committees is of great consequence to the medical profession. There can obviously be no pattern of invasion organisation for general use, except in barest outline, but in any locality the private practitioner will be in a key position. He will be a centre of information to the Services and civilians alike on medical arrangements for illness and casualties. The invasion committees are a responsibility of the defence regions of the country and the medical officers of the regions are acquainted with arrangements in detail. But like food distribution and emergency shelter quarters the provision of medical care remains "primarily a local problem," and Parliament has rightly handed this aspect of local administration to the localities.

* * *

Most of last week before the adjournment of the House for a short recess was taken up by a debate on production in which the new Minister, Mr. Lyttelton, presented his plan of campaign to an appreciative audience. Mr. Messer had some criticisms to make of the factory medical service, especially in Royal Ordnance factories. Though the service is being extended it does not yet cover more than a small part of the total personnel in factories. Yet the increasing employment of juveniles for long hours calls for vigilance. Mr. Chuter Ede, parliamentary secretary to the Board of Education, has just stated that the school medical service cannot be extended to cover the 14–18 group. The urgent need for some form of medical supervision was again brought out by the debate in the House of Lords when Lord Gainford raised the question of hours of work for children under 16 in the potteries and in the cotton industry. He suggested that this juvenile labour should be replaced by women, and the orders for permitting the extension of hours of work to over fifty a week rescinded "since they involve the sacrifice of the children's interests." Lord Gainford hopes for a further debate at an early date and the House of Commons will no doubt also bring the matter up again.

* * *

A curious sideline of parliamentary work was in an answer on the Maby Dowsing experiment. Mr. Maby is a gentleman who claims to be able to locate minerals, including unexploded bombs, by dowsing. He has been employed by the Admiralty, War Office and Air Ministry. It is true the total amount of money spent is only £58 plus minor expenditure for travelling, but the results of the scientific tests carried out at Mr. Maby's desire, have not led to an extension of the work. One M.P. when questions were being asked wished to know whether the Government would now consider employing astrologers.

tubercle in a nurse, clearly contracted there If we get a state medical service we'll get the same sort of thing—and they won't all be awards "Dr X has been sentenced to wear 3 bars sinister (black crepe, 1 in wide, to be worn 3 in above the umbilicus) for over-prescribing—or not filling up Form VX999 in quintuplicate" "Sorry Sonny, did I pinch you?" "What are the primroses for, Nurse? Oh, Primrose Day, Disraeli" There is no humour in politics or they could never have associated the guileless primrose with Dizzy, especially as his only recorded utterance on them is "They say they make an uncommonly good salad" I wonder if he was really like Maurois's portrait—oily, opulent (in spite of the debts), grandiose, cynically discerning Probably, for it is all confirmed by his almost unreadable novels, his epigrammatic, rhetorical young men with their ducal associations and Car-ears, absolute museum-pieces now Even their successors, the dominion-over-palm-and-pine wallahs, are almost extinct The pine and palm seem so damnably ungrateful I wonder what this kid's generation will think of us No eye-wash, jesting, trying to think clearly, perhaps that's about the most we can hope for "There we are! How does that feel, Sonny?"

* * *

What better present for a war-time housewife than Mrs Beeton's "Household Management"? There is nothing in it that she can do at present Even the simplest recipe for afternoon tea scones needs an ounce of butter and a tablespoon of castor sugar for eight scones, while cream scones take three ounces of butter or margarine, a gill of milk, and half a gill of cream to the dozen But the book is full of such things as dreams are made of—there are no fewer than twenty-five recipes for salmon, though only nine for herrings, but as these take from four to a dozen herrings each it would take some fifty to try them all Then there are the pictures If anyone begins to lack interest to see this war through let him look at the coloured plate of cheeses The very music of their names has gone into our beings, not only Cheddar, Cheshire, Stilton and Wensleydale, but such romantic titles as Schabzieger, Mainzer, Koboko and Dunragit—but not Olmutz, this I met in Vienna in 1912 when I boarded with a bourgeois family of high intelligence I tasted it once and ever after passed it as it came round the table with fully extended arms And when tired of making one's mouth water with recipes, there are many other things we can study Mistresses can learn how to manage maids now there are none to manage, and a husband can study the extent to which he is liable for debts contracted by his wife and be glad that he is not now, by reason of being her husband, liable for a tort committed by her Just now we naturally turn to Mrs B's chapter on vegetarian cookery to see whether we can get help with what Lord Woolton tells us about having to live more and more on vegetables There is not so much guidance as we would wish, since she is writing under what Mr Trotter called a "biological anomaly in the situation of man" resulting from "the effects of unrestricted food-supply" Now for the first time in the history of our nation we are likely to be living with a restricted food-supply, largely vegetable, under a code which does not allow the rich to gorge while the poor starve Under these new conditions we have to consider a calorie value to be obtained largely from the potato and the pulses, and variety in taste and flavour will loom large in next year's cookery When we consult Mrs Beeton we realise how much this variation depends on fats and milk, and on jam, sugar and syrups Thus green-pea soup includes "½ pint of milk, or milk and cream," brown vegetable soup "1 tablespoon of oil or 1 oz of butter" A carrot pudding takes 2 oz of butter for 2 persons and potato pie 1 oz for 3 or 4 Even nut preparations take "1 pint of milk, 2 or 3 tablespoons of cream and 1 oz of butter or margarine" for the fricassee, and for the galantine "some Bechamel sauce (p 192)," and when one turns to page 192 we find that sauce Bechamel takes 2 oz of butter and 1¼ pints of milk to make 1 pint Housewives had better get past the stage of experimental cookery while there are yet other foods for their husbands and their children, so that there may be better feeding and less grousing when we become compulsory vegetarians next winter, and even then they will be faced with the fuel problem Thus savoury lentils must be cooked for two hours and Scotch stew takes three to make The gas ring going all this time will make a heavy load on the fuel ration

These vegetarian foods seem to be infernally expensive or we might all rush for them A friend of mine bought some almond nut-meat He describes it as being "like a completely inert galantine, unobjectionable but quite tasteless," but it cost him 2*s* for a small tin I suppose vegetarians are still mostly persons of independent means as well as thought, and it must take a lot of almonds to make a pound of meat, so probably this is a legitimate price Other nut-meats are cheaper, I gather, but I fear they will taste of pea nut Vegetarians would not be keen on seeing their staple food snapped up by the carnivorous general public, but if we can gather more beans and peas this season we can boost up our protein intake without encroaching on their nuts, and in return perhaps they will tell us how to cook *a haricot so it will taste like steak and onions*

* * *

Most people will agree nowadays about giving sex instruction to youngsters, but this raises another matter "We have now in the school," writes a schoolmaster to me, "an intelligent and energetic boy of 14 who asked me outright to illuminate his darkness I did so and the boy remarked, 'It would make all the difference if everybody understood that part about the taboo'" Schoolboys, and schoolgirls too, talk of these things and use words that are now unutterable for grown-ups, though known to Shakespeare and often of respectable ancestry We have invested them with a taboo as rigid and irrational as anything discovered by Captain Cook My schoolmaster friend has discovered that only by accepting this vocabulary is he able to gain that confidence from them of which his letter gives evidence The essence of taboo is that it is irrational, unquestionable, and the violation of it is associated with the dread of an unknown penalty This is true of Polynesia and England A writer in the *Times* lately told of a brave little boy who spelt *sum-wun* and was jeered at by his elder sisters Says the writer, "I saw the dawn of unintelligence on his face" If irrational spelling can give birth to unintelligence, what about irrational emotional emphasis on words? It is a defensible proposition that much of the muddled thinking of today is built up on this worship of the black magic of words This schoolmaster explains the taboo to his boys I know from my own family experience that the child will accept the taboo as a rather silly part of the world around it and take reasonable care not to offend it But, without understanding, the taboo is a source of psychoneurotic fears both in childhood and later life A big question and one that is bound to rouse warmth of feeling

* * *

It was rather tedious waiting for Mrs Barwell to deliver herself of her fourth Last time she had albuminuria and a stillborn child which shook her confidence, moreover, she is not so young as she was Downstairs, Mr Barwell, his 13-year-old son and I beguiled the time by discussing the value of education It seemed that father and son had had some difference of opinion on the subject, and, rather meanly I thought, father brought me up as a reinforcement With as much pomposity as I could muster I told Master Barwell how many gallons of midnight oil I had burnt, how many difficult examinations I had passed before being granted the privilege of sitting around for several hours after a hard day's work waiting for babies to be born, but he seemed curiously unimpressed "But wouldn't *you* like to be a doctor, my boy?" I asked "Cor, no," was the emphatic reply, "I wants vor to join the Navy" "Even so," I said, "a high standard of education will stand you in good stead" He shook his head, "'Tis no use learnin' wot they teaches you to school They learns you all you 'as to know arter you goes een," he explained Sadly I mounted the stairs to receive Mrs Barwell's nine and a half pounder "What do you want to get such big babies for?" I asked Mr Barwell as he brought up another jug of hot water "'Tis naught to do wi' me, doctor," he said, "I only doos the tillin'"

Letters to the Editor

TRAINING COURSES FOR THE UNFIT

SIR,—Colonel Howitt and Major Wesson are correct in saying that the work of the Army School of Physical Training is too little known This school is the most interesting and profitable experiment in social medicine that has been made for many years Those who, before the war, were privileged to visit it cannot fail to be impressed with the amazing improvement in the physique of substandard recruits For this reason alone, their account of the school's work in war-time is very welcome

I am writing to ask why experiments of this type need be confined to the armed forces It seems a paradox, now the fitter men and women of the nation are being drafted into the Services, that any attempt to improve the less fit should be limited to preparations for slaughter Industry has now to maintain production by the labour of the less fit, and even frankly ill, members of the community Ex-miners are asked to return to the mines (involving very heavy work) "unfit" men to undertake heavy work, and women to undertake men's work All this after many years of life on a minimal diet and without any attempt at physical training No doubt, many men and women are able to adapt their bodies to unaccustomed heavy work, but many after a hopeless attempt are merely exhausted and ill

I suggest that organised and disciplined courses of physical training would, especially in industries such as mining, do much, with proper feeding, to help those entering or returning to the industry to fit themselves for heavy work and hence to maintain production and decrease absenteeism, which is often a reflection of undefinable illhealth or exhaustion Rehabilitation centres are being organised for the industrially injured, why not training courses, if necessary compulsory, for the industrially unfit? The two problems are closely related

Southwell, Notts T A LLOYD DAVIES

DOSAGE OF INSULIN

SIR,—Is not Dr Barnard's suggestion to abolish the different strengths of insulin rather a drastic method of avoiding errors in dosage? Surely the fact that certain members of our community want to be spoon-fed is no reason to do away with a refinement of treatment I realise the difficulty and have met few nurses and no patients who knew how to draw up a certain number of units of double-strength insulin in a unit syringe But this difficulty is only produced by our method of prescribing I now tell all my patients to get a syringe marked in cubic centimetres and prescribe the insulin accordingly It takes not much mathematical understanding to realise that double-strength insulin 1 0 c cm corresponds to single-strength insulin 2 0 c cm or quadruple-strength insulin 0 5 c cm, and the doctor knows that it all means 40 units

Coventry G BEHR

TRAUMA AND LEUKÆMIA

SIR,—In your annotation of March 7 you raise again the question of trauma as an ætiological factor in leukæmia My article in the *Lancet* in 1930 (i, 288) commented on the fact that, with one doubtful exception, all the cases collected, including my own, were of the myeloid type In a letter to the *British Medical Journal* a few months later I pointed out that, since the likelihood of accidental trauma preceding leukæmia was equal for the two main varieties, one would expect that these cases, wrongly interpreted as traumatic leukæmia, would occur in the proportional incidence of the two main types, myeloid and lymphatic The fact that all the cases I have described were of the myeloid variety suggested an authentic association with the previous trauma I submit that the reporting latterly of two cases of lymphatic leukæmia associated with trauma does not invalidate this argument It would indeed be surprising if the various components of the hæmatopoietic system were not to some extent susceptible to the same ætiological influences, though specific portions, such as non-granular formative tissue, might not be as strategically situated for, or sensitive to, that type of stimulus The dispersed nature of the myeloid tumour makes Ewing's sixth criterion inapplicable, many of my cases conform to the rest of the criteria I am glad to note that as critical a mind as Prof Henry Cohen's is prepared to consider Ewing's criteria as sound I do not think that undue significance need be attached to the fact that my case failed to convince the courts My experience of the procedure and judgment on that occasion convinces me that medical assessors for medical litigations would be a progressive step in the post-war world now being planned

London, N W 8 S CHARLES LEWSEN

BACTERIOLOGY IN THE FRENCH CONGO (*continued*)

The director of the veterinary department left for active service at the beginning of the war, so research in animal pathology has had to be suspended At the agricultural research station a severe epidemic of avian diphtheria ravaged the fowl-house, it only attacked birds under 4 months old, but in these the fatality was 90–95%

FRACTURES OF THE FEMORAL NECK

SIR,—Some recent writers on the treatment of fractures of the femoral neck have omitted to emphasise the senile condition of most of the sufferers or the tendency of the senile to break up as the result of such an injury or being put to bed or both Even if an ambulatory device such as the Whitman plaster or a walking calliper is applied, many of the cases to be found particularly in local government hospitals (where orthopædists sometimes find salutary experience) will not or cannot get about again, and thus avoid the liability to fatal hypostatic pulmonary congestion or bedsores, quite a number of them have barely been able to walk before they were injured (and hence the injury often) In other words, the degree of senility often renders the patient unable to avail himself of the treatment, however skilful, provided for his injury, or even renders treatment of the fracture apart from relieving discomfort unnecessary It should surely be taught that the condition of the patient and his history should determine the treatment, if any, to be employed, and influence the prognosis vastly more than the method of treatment adopted

Worksop M HAYDON-BAILLIE

RESUSCITATION IN SHOCK

SIR,—The pathogenesis of shock—its differentiation from collapse—must be left Certainly transfusion is sound, but its abuse should be avoided Timely venesection may, perhaps, hereafter diminish the number of the victims dying from massive transfusion[1], but as yet no-one dealing with these cases recognises such sequence, despite the case and post-mortem reports (*Brit med J* 1941, i, 427 ff) Even though the pronouncement of these latter should be uncertain, which it is not, general experience teaches that excesses of any kind are inimical to health That the blood-volume matters will be perceived in time Dr Dunlop must agree (*Lancet*, 1942 i, 384) He is appalled by the present-day practice of giving plasma and blood almost without limit to every case of shock As he says, the modern house-surgeon has not heard of the effect of coffee per rectum The truth is that the modern house-surgeon is imbued with the toxæmic origin of shock, and conceives that only massive transfusions combat it, perhaps as he gets older his views may alter

Excellent as may be the results of moderate transfusion, this procedure is not the only egg in the therapeutic basket There is something one can do more quickly than transfuse the patient, one without the risk of causing septicæmia (cf case III, Bywaters and Beall, *Brit med J* 1941, i, 430) It consists in placing the patient in the Trendelenburg position After all, the thing that matters most in shock is to conserve the cerebral circulation, to keep the vital centres alive, and, unless the patient is moribund, the Trendelenburg position ensures that In wounded men it is especially important it tends to prevent bleeding, the loss of precious blood Just as the aortic pressure is less in the

---

[1] "We little know how many under disease perish by large bleedings Timely transfusion may, perhaps hereafter diminish the numbers of these victims" (Blundell, J *Lancet*, 1828, ii, 486)

FROM THE PRESS GALLERY

Medical Care of the Worker

In the course of the debate on war production Mr F **Messer** said that man-power was being wasted in the health of the workers He had no doubt that much miscalled idle time was due to the physical condition of the workers who had arrived at a stage physically where it was necessary for there to be some break Mr Messer welcomed the introduction of the factory medical service, but he was not sure that the best use was being made of it Some managers assumed that all that is required is for some corner of the factory to be set aside for first-aid An efficient medical service would prevent much illness There were about forty Royal Ordnance factories, employing about a hundred medical men The first requirement of that service was the appointment of a suitable senior officer At the moment the head was Sir David Munro, who was also secretary of the Industrial Research Board and he believed did other things as well Sir David could not do the necessary planning if his interests were engaged in so many ways Mr Messer knew that Sir David had a very efficient deputy who did his work in his absence, but in the absence of the deputy the executive work was done by a woman who was not even a doctor, and so far as he knew had no knowledge of industrial medicine At Woolwich Arsenal an army officer, Colonel Johnson, was in charge, a doctor who had had no previous knowledge of industrial medicine, while the staff had been selected because of their knowledge of industrial medicine Friction was bound to occur The result was that there had been something like nine resignations and transfers from that important factory within twelve months and the Government had lost the services of some valuable people, including Dr Hilda White, who was known in the medical profession for her research work and knowledge of industrial medicine It would be interesting if the Minister would call for her letter of resignation and note the reason Many workers going into the factories today were inexperienced and he would like to see a table showing the numbers of cases, for instance, of dermatitis and how the increase in percentages and proportions resulted from lack of knowledge

Mr R **Assheton**, parliamentary secretary to the Ministry of Supply, said that Sir David Munro was a distinguished doctor, with wide contacts in the field of industrial medicine which had been of great value to the ministry, and it was thought that the ministry should not lose the advantage of those contacts Dr Amor had been appointed as Sir David's deputy, so that the increasing work of the medical services might be properly administered from headquarters Mr Messer had suggested that the doctor in charge of the medical service at Woolwich was without previous knowledge of industrial medicine, but Colonel Johnson had been medical officer in a number of factories Mr Messer had also asserted that there had been nine resignations and transfers from Woolwich during the past year There had been one resignation, Dr White, and she resigned because circumstances made it difficult for her to take night duty in rotation with the other members of the medical staff There had also been six transfers of medical staff within the period, but all of these had been within the Ministry of Supply medical service either to the regions or to the ministry's factories in the country Woolwich had been used as a training ground and it was normal for these people to be sent out from it The Government were not only fully aware of the danger of dermatitis, but were taking all possible measures, both curative and preventive, against it

Expenditure on Social Services

The statement giving the figures for expenditure on social services for 1939 and 1940 appeared in the Official Report for March 24, col 1827

QUESTION TIME

Shortening the Waiting-list

Up to the end of last week the number of patients in Scotland referred from the waiting lists of voluntary hospitals and treated in associated Emergency Scheme Hospitals was 3210, of whom 1125 were referred since the widening of the scheme announced at the beginning of this year (Mr T **Johnston** replying to Mr H **McNeil**)

Restrictions on Diathermy Apparatus

Sir **Ernest Graham Little** asked the Minister of Health whether he would inquire into, with a view to remedying the case, details of which had been furnished to him, of a British woman physician of high professional standing and reputation, who had been refused permission to continue the use of diathermy apparatus upon which her extensive practice and research work depended —Mr W S **Morrison**, postmaster general, replied I have received a joint deputation from the British Medical Association and the Parliamentary Medical Committee in regard to the restrictions at present placed on the use of electrical diathermy apparatus, and I have the matter under consideration

Medical War Committees and Home Guard

Mr T E **Groves** asked the Under Secretary of State for War what complaints he had received about the dilatory action of local medical war committees and their refusal to hear representatives of the Home Guard when discussing Home Guard affairs and whether he proposed to take any steps towards improving the existing situation —Mr D **Sandys** replied Very few complaints have been received and these have been looked into An Army Council instruction, whose terms have been agreed with the Central Medical War Committee, will be published shortly and should remove any misunderstandings

---

BACTERIOLOGY IN THE FRENCH CONGO

While the present cloud hangs over the parent Pasteur Institute in Paris it is heartening to learn of the activities of its daughter institute in Brazzaville some thousands of miles away in French Congo The report for 1940 of the director, Dr Jean Ceccaldi is a tribute not only to the keenness of the staff but also to the far seeing energy of Monsieur Eboue, the governor general, who has been responsible for many developments—strategic roads, native policy and so on—since Equatorial Africa rallied to de Gaulle The report deals mostly with routine work, for research has had to be curtailed Some 900 blood-examinations were performed in Europeans and 650 in natives Discoveries new to the colony were *Spirillum minus* and *Spirochæta duttoni*, the former from a Portuguese who had been bitten by a rat In sputum of native cases of pulmonary tuberculosis symbiosis of *Spirochæta bronchialis* with the tubercle bacillus has been confirmed Seven cases of leprosy were diagnosed, in four of whom the organisms were demonstrated in the nasal mucus

The preparation of vaccines was one of the main activities of the institute, because of the large demand for meningococcal vaccine, of which nearly 400 litres was produced during the year Cerebrospinal fever runs a regular cycle in the colony, appearing in the dry season and disappearing with the first rains, the report expresses confidence in the prospects of prophylactic inoculation The anti rabies department has continued to employ the *virus fixe* from Paris, which is now in its 187th passage A carbolised preparation is dispatched to every part of the colony, and 48 treatments have been administered Typhoid fever has appeared in Brazzaville and six strains were isolated during the year, three being in Europeans Neurotropic yellow-fever virus is being maintained and is now in its 407th passage By the mouse-protection test it was proved that an epidemic of malignant jaundice was not yellow fever

In the sleeping-sickness service only 2 new cases were diagnosed in Europeans though there were over 200 in natives Analysis of the diagnostic measures adopted is instructive In 209 cases, 42 were by gland-puncture, 2 by triple centrifugation, 10 by triple centrifugation and thick-drop method, 42 by gland-puncture, triple centrifugation and thick drop, 19 by gland puncture and cerebrospinal fluid, 1 by triple centrifugation and c s f, 1 by gland-puncture, thick-drop and c s f, 11 by thick drop, triple centrifugation and c s f, 41 by gland puncture, triple centrifugation, thick drop and c s f, 40 by c s f alone Several cases of reinfection with trypanosomes after a ten-year interval of freedom were discovered

Continued at foot of next page

m indefinitely postponed and consequently the pply of national bread of which only 75% will be of % extraction, will be correspondingly prolonged e provision of 100% extraction flour would at once put stop to this uncertainty of composition of the war ead, the factor which was perhaps the most important ason for the failure of the ministry's wheatmeal loaf.

Dr. Harriette Chick's article in your last issue adduces me important new data demonstrating the superiority 100% wholemeal over 85% national wheatmeal in otein content The diminution, amounting to the rtual disappearance, of meat, milk, cheese and eggs om the diet of the vast majority of our people, makes all the more necessary to secure the maximum quantity of protein that bread can furnish. when one adds the alue for the poorer population of the protective subances, of which again bread is the principal and in some rcumstances almost the only source the choice of hole-grain flour in preference to wheatmeal is surely escapable

Utilisation of the whole of the wheat grain for human od would effect an additional saving of 10–15% stimated at about 700 000 tons a year) over and above he saving from substituting 85% (wheatmeal) for the 0–75% white flour The imperious necessity of econmising shipping space has been emphasised by two very erious ministerial announcements· thus the Prime linister declared that the shipping position in the tlantic has 'worsened" of late, and the Parliamentary ecretary to the Ministry of Agriculture has twice given he warning that ' the food situation is graver than it as ever been " In such a critical phase of our fortunes submit that the public will not, and should not, be atisfied with anything less than complete utilisation of mported wheat for the national bread, and I hope our profession will now exert all its influence in favour of a 100% extraction war bread

House of Commons E GRAHAM-LITTLE

PROGNOSIS OF MENTAL INSTABILITY

SIR,—In your issue of March 28 (p 377) Drs Barton Hall state "Harris (1938) investigating 123 cases of anxiety neurosis . found 31% to be well a term which he did not define 10 years later' If one reads the section of my paper headed Classification of Cases I think it should be fairly clear that I used the term "well' to mean free from symptoms

Bryanston Court, W 1 A HARRIS

ANTISEPTIC EMULSIONS

SIR,—In the paper by Heggie et al (March 21 p 347) on the treatment of superficial granulating areas frequent references are made to water-in-oil and oil-in-water types of emulsions and formulæ are given for a number of preparations I would like to know how these workers vary the type of emulsion by simply varying the quantities of the similar constituents and how they produce a water-in-oil emulsion using Lanette Wax SX' as the emulsifying agent. This is contrary to the maker's statement about its properties and to my own experience in using it

St. Bartholomew's Hospital E C 1 JAMES COUTTS

REGISTER OF ORTHOPTISTS —The Board of Registration of Medical Auxiliaries have issued a new edition (1942) of their register of orthoptists Medical practitioners and hospital authorities may obtain free copies of the register from the secretary of the board BMA House, Tavistock Square, London, W C 1

'HEPASTAB FORTE'—Under this name Messrs. Boots have put on the market a concentrated liver extract for intramuscular or intravenous injection It is obtainable in 2 c cm ampoules and in 10 c cm or 25 c cm rubber-capped vials Each 2 c cm. of the extract is obtained from 100 g of liver and is therapeutically equivalent to 4000–5000 g of fresh liver by mouth

'BENERVA COMPOUND VITAMIN TABLETS,' now issued by Roche Products, each contain 1 mg. of aneurine (vitamin B_1), 1 mg of riboflavin and 15 mg of nicotinic acid, the three factors of the vitamin-B complex for which there are definite clinical indications 'Benerva,' on the other hand contains aneurine only

Obituary

HUGH MILTON STEWART

M D CAMB

"Stewart of Dulwich" who died at Guy's Hospital on Feb 23 earned his affectionate title by nearly fifty years of keen work in the Borough as surgeon to Sydenham Children's Hospital as medical officer to Dulwich College and as honorary to local charitable institutions Hugh Milton Stewart was born at Port Elizabeth Natal in 1868 but was educated in England at Dulwich College and at Christ's College Cambridge, where he obtained a first-class in the natural sciences tripos He entered Guy's with a scholarship, and after graduation in 1894 held resident posts at the hospital His early bent was towards hospital and consultant work, but in 1895 he joined an old-established practice in Dulwich One of his medical friends writes. Stewart's kindly tolerance never faltered, his judgment of his fellows was sound but he spoke evil of no man His culture was wide, his eye observant, and with him a chat over the fire, a walk in the country, or a stroll in the garden were stimulating pleasures His wife, a sister of Sir Arthur Shipley played a notable part in all his activities and shared his devotion to Guy's He leaves her with two daughters and two sons—one a doctor

Dr JOHN JAMES FRASER RUSSELL, whose death in action is reported qualified from the University of Edinburgh in 1933 When war broke out he was in practice in Cape Town One of his Edinburgh contemporaries remembers him as sturdy in physique diligent in study, and somewhat grave in temperament He had an air of maturity, uncommon in undergraduates but his kindly manner won him an unassuming popularity

Medical News

Royal College of Physicians of London

At a comitia of the college held on March 30 Sir Charles Wilson was re-elected president

Diplomas in ophthalmic medicine and surgery and in tropical medicine and hygiene were granted, jointly with the Royal College of Surgeons to those named in our issue of March 21 (p 370) in a report of a meeting of the Royal College of Surgeons

Society of Apothecaries of London

At a meeting of the court of assistants held on March 24, with Sir Stanley Woodwark master in the chair Dr J P Hedley was reappointed to represent the society on the Central Midwives Board The following having completed the final examination were granted the diploma of the society entitling them to practise medicine, surgery and midwifery · G J Ambrose, St Mary's, P A Eyre, St Bart's, E R Jordan, Middlesex, and H. Kessel, Anderson Coll, Glasg

Royal College of Obstetricians and Gynæcologists

At a recent examination for the diploma of the college the following were successful —

Jean R. C Burton-Brown Mona M Davin-Power Margaret M Flecker Perla Greeves S J Hadfield Dorothy M Hicks, Christia F Lucas J K. Martin Florence M McClelland R. J Mitchell Eileen E Perry E E Rawlings Joyce M Scholefield Edith Scott, H A Shaw and Dorothy M Shotton

St. John's Hospital for Diseases of the Skin, London

The times of attendance for outpatients at this hospital are 1-3 P.M. on Mondays to Fridays and during the summer months 5 30–6 30 P.M. on Tuesdays and Fridays

Postgraduate Lectures in Edinburgh

The following Honyman Gillespie lectures will be given on Thursdays, at 4.30 P.M., at the Edinburgh Royal Infirmary during the summer term April 23 Dr I. Simson Hall, progressive middle-ear deafness, April 30, Dr F E. Reynolds concerning cancer, May 7, Mr R C Alexander, prostatic enlargement, May 14 Mr W O Kermack, D Sc. recent advances in chemotherapy, May 28, Mr G L. Alexander, surgical lesions of the spinal cord and nerve roots, June 11, Dr Douglas Kerr, delinquency The lectures are open to all graduates and senior students horizontal position compared with that when standing, so we may believe that in the Trendelenburg position the aortic pressure is less than in the horizontal When a patient is in the raised pelvic position, the long axis of the body being at 45° to the horizontal, the pressure in the bladder, says Trendelenburg,[2] may fall to minus-10 cm of water, while in the horizontal position this pressure is positive Not only the viscera fall towards the diaphragm, but also the blood in the great veins The Trendelenburg position not only tends to prevent or limit bleeding, it tends to prevent the occurrence of shock It must have this effect in wounded men just as it has this effect in patients under spinal anæsthesia without this position, spinal anæsthesia would be impossible—with the patient in the horizontal position a fatal issue would occur in every case If wounded men on the battle-field were brought in on stretchers in the Trendelenburg position and transported in an ambulance in this position (which could easily be arranged), if they were put to bed in this position and any necessary operation were performed in this position (the patients being conveyed to and brought back from the theatre in this position), and if they were subsequently nursed in this position, until all signs of shock had disappeared, the results, I think, would be very different from what they were during the last war, and from what perhaps they may be in this

Rugby R H PARAMORE

MIGRATION OF FOREIGN BODIES

SIR,—Prof Lambert Rogers's letter in your issue of March 28 prompts me to record the following example of a foreign body in the chest that I saw when resident medical officer of the London Chest Hospital in 1934

A housewife, aged 26, was admitted to the hospital under the care of Dr H V Morlock, with a history of intermittent sharp pain in the left side of the chest for 4 years, a dry unproductive cough for 10 months, and two small frank hæmoptyses that finally persuaded her to seek medical advice Antero posterior and lateral X-ray pictures of the chest revealed a needle in the central portion of the left lung in close relation to the heart border and about 1 in above the diaphragm After induction of a preliminary pneumothorax the chest was explored by Mr W H C Romanis and Mr T Holmes Sellors The needle was felt embedded in the lung with the point obliquely buried in parietal pericardium for a short distance It was friable and broke into fragments during dissection It was completely removed piecemeal, the lung was repaired and an uninterrupted recovery followed

The patient could supply no information to explain how this needle, which was a medium-sized domestic sewing needle, came to be in her chest She had no recollection of ever being pricked The case affords an example of the migratory tendency of sharply pointed foreign bodies and of how their first lodgement in the tissues can pass quite unsuspected

Harley Street, W 1 N LLOYD RUSBY

PERFORATED PEPTIC ULCER DURING AIR-RAIDING

SIR,—There are two questions we should like to ask Dr Jennings, or indeed anyone else The first is if the air-raid increases reported in Liverpool, Bristol and London were not mainly due to anxiety, hurried meals, and possibly anxious over-smoking, what were they due to ? And, whatever the ætiology of peptic ulcers—acid, bacteria or embolus—surely D T Davies and A T M Wilson (*Lancet*, 1937, ii, 1353 , 1939, ii, 723) have shown that anxiety plays a noteworthy part in at any rate facilitating chronic and dangerous ulcers ? The fact that hypothalamic damage can cause ulceration is of course, as Dr Jennings says, no evidence that this is the actual mechanism in patients , but it does show that higher-centre stimuli can cause damage to the stomach, and therefore that emotional disturbance would at least have a mechanism by which to work The second question is supposing for a moment that anxiety is an important factor in the ætiology, need we libel our grandmothers, as Dr Jennings suggests we need, by saying that the fact that young women perforated with twenty times the relative frequency must mean that they were twenty times as anxious ? Is it not possible that young women perforate just as frequently as they ever did, but older women and all ages of men far more frequently ? In fifty years ending in 1903 Brunner collected 170 perforations in young ladies between 17 and 26 , today, aided of course by the tendency to publish operation statistics which could not have existed long before Brunner's time, it would be easy to find far more cases in the same age-group in the same period Does the relative decrease in female, and especially young female, perforations represent a numerical decrease in female cases, a numerical increase in male cases, or both ? We have learnt so much from Dr Jennings's paper (*Lancet*, 1940, i, 395) that we hope he can tell us the answer to this question as well

Charing Cross Hospital
Medical School, W C 2

D N STEWART
D M DE R WINSER

SUTURE MATERIAL

SIR,—Your annotation (March 14, p 329) seems to have been directed partly with an eye to economy, and partly in recognition of the increased use of non-absorbable sutures With the first point in mind may I draw attention to the advantages and economy to be derived *from the use of stainless-steel wire for superficial sutures* The wire is still available in a variety of gauges, but 40 gauge (4 8 mils) is a very useful size, having the thickness of fine horsehair, with much greater tensile strength It can thus be used for suturing under tension which horsehair would not take, with consequent advantage in cosmetic result Its chief attraction is that, though the wire is softly flexible and painless on removal, it has sufficient rigidity to make the first knot absolutely secure, and as a consequence the pressure and position of the opposing skin edges can be nicely calculated The slight stiffness of the wire gives no increased difficulty in tying In situations like the face it is unnecessary to tie a second knot As the wound heals, and the œdema of the wound lips subsides, the wire is left standing up like a hoop, for easy removal The cheapness, ease of sterilisation by boiling, absence of deterioration, will be obvious to any one using the material As an aid to the hair line suturing of scars, there is nothing to equal it The tissues show no reaction, and the subsequent scars are cosmetically excellent The use of higher gauge wires than 20 (36 mils) is not recommended, as once past a certain diameter its rigidity makes its use objectionable, though it still retains certain advantages

White Lodge Hospital, Newmarket J GRANT BONNIN

THE NATIONAL LOAF

SIR,—The decision of the Minister of Food to prohibit the milling of white flour, except under very restricted conditions, and to provide, for the national war bread exclusively, wheatmeal flour of 85% extraction, is welcome, but since the new loaf is to be compulsory an examination of exactly what we have to expect in it is imperative A statutory order dated March 11, 1942, contains the following specification —

> "National wheatmeal" means, in relation to flour produced *after the 22nd day of March 1942,* flour of 85% extraction, produced in the United Kingdom, so as to contain the maximum quantity of wheat germ which, having regard to the type of milling plant, can be included in such flour but so as not to include any course bran

It will be noted that the quantity of wheat germ to be included depends upon the type of milling plant used This seems an unfortunate stipulation It again leaves to the millers the decision as to the most important constituent of bread, and introduces an element of mystification and confusion factors which militated so gravely against the public acceptance of the national wheatmeal loaf during the year of its trial

Recent public statements by the minister indicate (1) that calcium is to be added to the national loaf but not vitamin B_1, and (2) that it will be lawful for the bakers to add 25% of white flour in making the national bread "until stocks are exhausted" As the minister, however, has announced that the import of Canadian white flour of 70–73% extraction will be continued, to be added to "security stocks," the date of their exhausation would eem indefinitely postponed, and consequently the upply of national bread, of which only 75% will be of 5% extraction. will be correspondingly prolonged he provision of 100% extraction flour would at once put stop to this uncertainty of composition of the war read, the factor which was perhaps the most important eason for the failure of the ministry's wheatmeal loaf

---

[2] Trendelenburg, F Sammlung klinischer Vorträge, 1886–90, No 355 (1)

Dr Harriette Chick s article in your last issue adduces ome important new data demonstrating the superiority f 100% wholemeal over 85% national wheatmeal in protein content The diminution, amounting to the virtual disappearance, of meat, milk, cheese and eggs from the diet of the vast majority of our people, makes it all the more necessary to secure the maximum quantity of protein that bread can furnish , when one adds the value for the poorer population of the protective substances, of which again bread is the principal and in some circumstances almost the *only* source, the choice of whole-grain flour in preference to wheatmeal is surely inescapable

Utilisation of the whole of the wheat grain for human food would effect an additional saving of 10–15% (estimated at about 700,000 tons a year) over and above the saving from substituting 85% (wheatmeal) for the 70–75% white flour The imperious necessity of economising shipping space has been emphasised by two very serious ministerial announcements · thus the Prime Minister declared that the shipping position in the Atlantic has " worsened " of late, and the Parliamentary Secretary to the Ministry of Agriculture has twice given the warning that ' the food situation is graver than it has ever been." In such a critical phase of our fortunes I submit that the public will not, and should not, be satisfied with anything less than complete utilisation of imported wheat for the national bread, and I hope our profession will now exert all its influence in favour of a 100% extraction war bread

House of Commons		E GRAHAM-LITTLE

PROGNOSIS OF MENTAL INSTABILITY

SIR,—In your issue of March 28 (p 377) Drs Barton Hall state " Harris (1938) investigating 123 cases of anxiety neurosis found 31% to be well a term which he did not define, 10 years later " If one reads the section of my paper headed Classification of Cases, I think it should be fairly clear that I used the term " well ' to mean free from symptoms

Bryanston Court W 1		A HARRIS

ANTISEPTIC EMULSIONS

SIR,—In the paper by Heggie et al (March 21 p 347) on the treatment of superficial granulating areas frequent references are made to water-in-oil and oil-in-water types of emulsions and formulæ are given for a number of preparations I would like to know how these workers vary the type of emulsion by simply varying the quantities of the similar constituents, and how they produce a water-in-oil emulsion using ' Lanette Wax SX ' as the emulsifying agent This is contrary to the maker's statement about its properties and to my own experience in using it

St. Bartholomew's Hospital E C 1		JAMES COUTTS

REGISTER OF ORTHOPTISTS —The Board of Registration of Medical Auxiliaries have issued a new edition (1942) of their register of orthoptists Medical practitioners and hospital authorities may obtain free copies of the register from the secretary of the board, BMA House, Tavistock Square, London, W C 1

' HEPASTAB FORTE '—Under this name Messrs. Boots have put on the market a concentrated liver extract for intramuscular or intravenous injection It is obtainable in 2 c cm ampoules and in 10 c cm or 25 c cm rubber-capped vials Each 2 c cm of the extract is obtained from 100 g of liver and is therapeutically equivalent to 4000–5000 g of fresh liver by mouth

' BENERVA COMPOUND VITAMIN TABLETS,' now issued by Roche Products, each contain 1 mg. of aneurine (vitamin B_1) 1 mg of riboflavin and 15 mg of nicotinic acid, the three factors of the vitamin-B complex for which there are definite clinical indications ' Benerva,' on the other hand, contains aneurine only

Obituary

HUGH MILTON STEWART

M D CAMB

" Stewart of Dulwich " who died at Guy's Hospital on Feb 23 earned his affectionate title by nearly fifty years of keen work in the Borough as surgeon to Sydenham Children's Hospital as medical officer to Dulwich College, and as honorary to local charitable institutions Hugh Milton Stewart was born at Port Elizabeth. Natal in 1868 but was educated in England at Dulwich College and at Christ's College. Cambridge, where he obtained a first-class in the natural sciences *tripos* He entered Guy s with a scholarship and after graduation in 1894 held resident posts at the hospital His early bent was towards hospital and consultant work, but in 1895 he joined an old-established practice in Dulwich One of his medical friends writes Stewart's kindly tolerance never faltered , his judgment of his fellows was sound, but he spoke evil of no man His culture was wide his eye observant, and with him a chat over the fire, a walk in the country, or a stroll in the garden were stimulating pleasures His wife a sister of Sir Arthur Shipley, played a notable part in all his activities and shared his devotion to Guy's He leaves her with two daughters and two sons—one a doctor

Dr JOHN JAMES FRASER RUSSELL. whose death in action is reported qualified from the University of Edinburgh in 1933 When war broke out he was in practice in Cape Town One of his Edinburgh contemporaries remembers him as sturdy in physique diligent in study and somewhat grave in temperament He had an air of maturity uncommon in undergraduates, but his kindly manner won him an unassuming popularity

Medical News

Royal College of Physicians of London

At a comitia of the college held on March 30 Sir Charles Wilson was re-elected president

Diplomas in ophthalmic medicine and surgery and in tropical medicine and hygiene were granted, jointly with the Royal College of Surgeons, to those named in our issue of March 21 (p 370) in a report of a meeting of the Royal College of Surgeons

Society of Apothecaries of London

At a meeting of the court of assistants held on March 24, with Sir Stanley Woodwark, master, in the chair, Dr J P. Hedley was reappointed to represent the society on the Central Midwives Board The following having completed the final examination, were granted the diploma of the society entitling them to practise medicine, surgery and midwifery G J Ambrose, St Mary s P A Eyre, St Bart's E. R Jordan, Middlesex , and H. Kessel, Anderson Coll., Glasg

Royal College of Obstetricians and Gynæcologists

At a recent examination for the diploma of the college the following were successful —

Jean R C Burton Brown Mona M Davin Power Margaret M Flecker Perla Greeves S J Hadfield Dorothy M. Hicks, Christia F Lucas J K Martin Florence M McClelland R. J Mitchell, Eileen E Perry E E Rawlings Joyce M Scholefield, Edith Scott, H A Shaw and Dorothy M Shotton

St. John's Hospital for Diseases of the Skin, London

The times of attendance for outpatients at this hospital are 1-3 P M. on Mondays to Fridays and, during the summer months, 5 30–6 30 P M. on Tuesdays and Fridays

Postgraduate Lectures in Edinburgh

The following Honyman Gillespie lectures will be given on Thursdays, at 4.30 P M., at the Edinburgh Royal Infirmary during the summer term April 23 Dr I. Simson Hall, progressive middle-ear deafness , April 30, Dr F E Reynolds, concerning cancer , May 7, Mr R C Alexander, prostatic enlargement , May 14, Mr W O Kermack, D Sc , recent advances in chemotherapy , May 28 Mr G L Alexander, surgical lesions of the spinal cord and nerve roots , June 11, Dr Douglas Kerr, delinquency The lectures are open to all graduates and senior students horizontal position compared with that when standing, so we may believe that in the Trendelenburg position the aortic pressure is less than in the horizontal When a *patient is in the raised pelvic position, the long axis of* the body being at 45° to the horizontal, the pressure in the bladder, says Trendelenburg,[2] may fall to minus-10 cm of water, while in the horizontal position this pressure is positive Not only the viscera fall towards the diaphragm, but also the blood in the great veins The Trendelenburg position not only tends to prevent or limit bleeding, it tends to prevent the occurrence of shock It must have this effect in wounded men just as it has this *effect in patients under spinal anæsthesia* without this position, spinal anæsthesia would be impossible—with the patient in the horizontal position a fatal issue would occur in every case If wounded men on the battle-field were brought in on stretchers in the Trendelenburg position and transported in an ambulance in this position (which could easily be arranged), if they were put to bed in this position and any necessary operation were performed in this position (the patients being conveyed *to and brought back from the theatre in this position*), and if they were subsequently nursed in this position, until all signs of shock had disappeared, the results, I think, would be very different from what they were during the last war, and from what perhaps they may be in this

Rugby R H PARAMORE

MIGRATION OF FOREIGN BODIES

SIR,—Prof Lambert Rogers's letter in your issue of March 28 prompts me to record the following example of a foreign body in the chest that I saw when resident medical officer of the London Chest Hospital in 1934

A housewife, aged 26, was admitted to the hospital under the care of Dr H. V Morlock, with a history of intermittent sharp pain in the left side of the chest for 4 years, a dry unproductive cough for 10 months, and two small frank hæmoptyses that finally persuaded her to seek medical advice Antero posterior and lateral X ray pictures of the chest revealed a needle in the central portion of the left lung in close relation to the heart border and about 1 in above the diaphragm After induction of a preliminary pneumothorax *the chest was explored by Mr W H C Romanis and Mr T* Holmes Sellors The needle was felt embedded in the lung with the point obliquely buried in parietal pericardium for a short distance It was friable and broke into fragments during dissection It was completely removed piecemeal, the lung was repaired and an uninterrupted recovery followed

The patient could supply no information to explain how this needle, which was a medium-sized domestic sewing needle, came to be in her chest She had no recollection of ever being pricked The *case affords an example* of the migratory tendency of sharply pointed foreign bodies and of how their first lodgement in the tissues can pass quite unsuspected

Harley Street, W 1 N LLOYD RUSBY

PERFORATED PEPTIC ULCER DURING AIR-RAIDING

SIR,—There are two questions we should like to ask Dr Jennings, or indeed anyone else The first is if the air-raid increases reported in Liverpool, Bristol and London were not mainly due to anxiety, hurried meals, and possibly anxious over-smoking, what were they due *to ? And, whatever the ætiology of peptic ulcers—acid,* bacteria or embolus—surely D T Davies and A T M Wilson (*Lancet*, 1937, ii, 1353 , 1939, ii, 723) have shown that anxiety plays a noteworthy part in at any rate facilitating chronic and dangerous ulcers ? The fact that hypothalamic damage can cause ulceration is of course, as Dr Jennings says, no evidence that this is the actual mechanism in patients , but it does show that higher-centre stimuli can cause damage to the stomach, and therefore that emotional disturbance would at least have a mechanism by which to work The second question is supposing for a moment that anxiety is an important factor in the ætiology, need we libel our grandmothers, as Dr Jennings suggests we need, by saying *that the fact that young* women perforated with twenty times the relative frequency must mean that they were twenty times as anxious ? Is it not possible that young women perforate just as frequently as they ever did, but older women and all ages of men far more frequently ? In fifty years ending in 1903 Brunner collected 170 perforations in young ladies between 1 and 26 , today, aided of course by the tendency to publish operation statistics which could not have existed long before Brunner's time, it would be easy to find far more cases in the same age-group in the same period Does the relative decrease in female, and especially young female, perforations represent a *numerical* decrease *in female* cases, a numerical increase in male cases, or both ? We have learnt so much from Dr Jennings's paper (*Lancet*, 1940, i, 395) that we hope he can tell us the answer to this question as well

Charing Cross Hospital
Medical School, W C 2

D N STEWART
D M DE R WINSER

SUTURE MATERIAL

SIR,—Your annotation (March 14, p 329) seems to have been directed partly with an eye to economy, and partly in recognition of the increased use of non-absorbable sutures With the first point in mind may I draw *attention to the* advantages and economy to be derived from the use of stainless-steel wire for superficial sutures The wire is still available in a variety of gauges, but 40 gauge (4 8 mils) is a very useful size, having the thickness of fine horsehair, with much greater tensile strength It can thus be used for suturing under tension which horsehair would not take, with consequent advantage in cosmetic result Its chief attraction is that, though the wire is softly flexible and painless on removal, it has sufficient rigidity to make the first knot absolutely secure, and as a consequence the pressure and position of the opposing skin edges can be nicely calculated The slight stiffness of the wire gives no increased difficulty in tying In situations like the face it is unnecessary to tie a second knot As the wound heals, and the œdema of the wound lips subsides, the wire is left standing up like a hoop, for easy removal The cheapness, ease of sterilisation by boiling, absence of deterioration, will be obvious to any one using the material As an aid to the hair line *suturing of scars, there is nothing to equal it* The tissues show no reaction, and the subsequent scars are cosmetically excellent The use of higher gauge wires than 20 (36 mils) is not recommended, as once past a certain diameter its rigidity makes its use objectionable, though it still retains certain advantages

White Lodge Hospital, Newmarket J GRANT BONNIN

THE NATIONAL LOAF

SIR,—The decision of the Minister of Food to prohibit the milling of white flour, except under very restricted conditions, and to provide, for the national war bread exclusively, wheatmeal flour of 85% extraction, is welcome, *but since the new loaf* is to be compulsory an examination of exactly what we have to expect in it is imperative A statutory order dated March 11, 1942, contains the following specification —

> " National wheatmeal " means, in relation to flour produced after the 22nd day of March 1942, flour of 85% extraction produced in the United Kingdom, so as to contain the maximum quantity of wheat germ which, having regard to the type of milling plant, can be included in such flour but so as *not to include any course bran*

It will be noted that the quantity of wheat germ to be included depends upon the type of milling plant used This seems an unfortunate stipulation It again leaves to the millers the decision as to the most important constituent of bread, and introduces an element of mystification and confusion factors which militated so gravely against the public acceptance of the national wheatmeal loaf during the year of its trial

Recent *public statements* by the minister indicate (1) that calcium is to be added to the national loaf but not vitamin B_1, and (2) that it will be lawful for the bakers to add 25% of white flour in making the national bread " until stocks are exhausted " As the minister, however, has announced that the import of Canadian white flour of 70–73% extraction will be continued, to be added to " security stocks," the date of their exhausation would em indefinitely postponed, and consequently the pply of national bread, of which only 75% will be of % extraction, will be correspondingly prolonged he provision of 100% extraction flour would at once put stop to this uncertainty of composition of the war read, the factor which was perhaps the most important eason for the failure of the ministry's wheatmeal loaf

---

[2] Trendelenburg, F Sammlung klinischer Vorträge, 1886–90, No 355 (1)

Dr Harriette Chick s article in your last issue adduces ome important new data demonstrating the superiority f 100% wholemeal over 85% national wheatmeal in rotein content The diminution, amounting to the ctual disappearance, of meat, milk, cheese and eggs rom the diet of the vast majority of our people, makes t all the more necessary to secure the maximum quantity of protein that bread can furnish, when one adds the value for the poorer population of the protective substances, of which again bread is the principal and in some ircumstances almost the only source, the choice of whole-grain flour in preference to wheatmeal is surely nescapable

Utilisation of the whole of the wheat grain for human food would effect an additional saving of 10–15% (estimated at about 700,000 tons a year) over and above the saving from substituting 85% (wheatmeal) for the 70–75% white flour The imperious necessity of economising shipping space has been emphasised by two very serious ministerial announcements thus the Prime Minister declared that the shipping position in the Atlantic has "worsened" of late, and the Parliamentary Secretary to the Ministry of Agriculture has twice given the warning that "the food situation is graver than it has ever been" In such a critical phase of our fortunes I submit that the public will not, and should not, be satisfied with anything less than complete utilisation of imported wheat for the national bread, and I hope our profession will now exert all its influence in favour of a 100% extraction war bread

House of Commons   E GRAHAM-LITTLE

PROGNOSIS OF MENTAL INSTABILITY

SIR,—In your issue of March 28 (p 377) Drs Barton Hall state "Harris (1938) investigating 123 cases of anxiety neurosis found 31% to be well, a term which he did not define, 10 years later" If one reads the section of my paper headed *Classification of Cases*, I think it should be fairly clear that I used the term "well" to mean free from symptoms

Bryanston Court, W 1   A HARRIS

ANTISEPTIC EMULSIONS

SIR,—In the paper by Heggie et al (March 21 p 347) on the treatment of superficial granulating areas frequent references are made to water-in-oil and oil-in-water types of emulsions and formulæ are given for a number of preparations I would like to know how these workers vary the type of emulsion by simply varying the quantities of the similar constituents, and how they produce a water-in-oil emulsion using 'Lanette Wax SX' as the emulsifying agent This is contrary to the maker's statement about its properties and to my own experience in using it

St Bartholomew's Hospital, E C 1   JAMES COUTTS

REGISTER OF ORTHOPTISTS —The Board of Registration of Medical Auxiliaries have issued a new edition (1942) of their register of orthoptists Medical practitioners and hospital authorities may obtain free copies of the register from the secretary of the board, BMA House, Tavistock Square, London, W C 1

'HEPASTAB FORTE'—Under this name Messrs Boots have put on the market a concentrated liver extract for intramuscular or intravenous injection It is obtainable in 2 c cm ampoules and in 10 c cm or 25 c cm rubber-capped vials Each 2 c cm of the extract is obtained from 100 g of liver and is therapeutically equivalent to 4000–5000 g of fresh liver by mouth

'BENERVA COMPOUND VITAMIN TABLETS,' now issued by Roche Products, each contain 1 mg of aneurine (vitamin B_1) 1 mg of riboflavin and 15 mg of nicotinic acid, the three factors of the vitamin-B complex for which there are definite clinical indications 'Benerva,' on the other hand, contains aneurine only

Obituary

HUGH MILTON STEWART

M D CAMB

"Stewart of Dulwich" who died at Guy's Hospital on Feb 23 earned his affectionate title by nearly fifty years of keen work in the Borough as surgeon to Sydenham Children's Hospital as medical officer to Dulwich College, and as honorary to local charitable institutions Hugh Milton Stewart was born at Port Elizabeth Natal, in 1868 but was educated in England at Dulwich College and at Christ's College Cambridge, where he obtained a first-class in the natural sciences tripos He entered Guy's with a scholarship, and after graduation in 1894 held resident posts at the hospital His early bent was towards hospital and consultant work, but in 1895 he joined an old-established practice in Dulwich One of his medical friends writes Stewart's kindly tolerance never faltered, his judgment of his fellows was sound, but he spoke evil of no man His culture was wide, his eye observant, and with him a chat over the fire, a walk in the country, or a stroll in the garden were stimulating pleasures His wife, a sister of Sir Arthur Shipley, played a notable part in all his activities and shared his devotion to Guy's He leaves her with two daughters and two sons—one a doctor

---

Dr JOHN JAMES FRASER RUSSELL, whose death in action is reported, qualified from the University of Edinburgh in 1933 When war broke out he was in practice in Cape Town One of his Edinburgh contemporaries remembers him as sturdy in physique diligent in study, and somewhat grave in temperament He had an air of maturity, uncommon in undergraduates, but his kindly manner won him an unassuming popularity

Medical News

Royal College of Physicians of London

At a comitia of the college held on March 30 Sir Charles Wilson was re elected president

Diplomas in ophthalmic medicine and surgery and in tropical medicine and hygiene were granted, jointly with the Royal College of Surgeons, to those named in our issue of March 21 (p 370) in a report of a meeting of the Royal College of Surgeons

Society of Apothecaries of London

At a meeting of the court of assistants held on March 24, with Sir Stanley Woodwark, master, in the chair, Dr J P Hedley was reappointed to represent the society on the Central Midwives Board The following having completed the final examination, were granted the diploma of the society entitling them to practise medicine, surgery and midwifery G J Ambrose, St Mary's, P A Eyre, St Bart's, E R Jordan, Middlesex, and H Kessel, Anderson Coll, Glasg

Royal College of Obstetricians and Gynæcologists

At a recent examination for the diploma of the college the following were successful —

Jean R C Burton-Brown, Mona M Davin Power Margaret M Flecker Perla Greeves S J Hadfield Dorothy M Hicks, Christia F Lucas J K Martin Florence M McClelland R J Mitchell Eileen E Perry E E Rawlings Joyce M Scholefield, Edith Scott, H A Shaw and Dorothy M Shotton

St John's Hospital for Diseases of the Skin, London

The times of attendance for outpatients at this hospital are 1-3 P M on Mondays to Fridays and, during the summer months, 5 30–6 30 P M on Tuesdays and Fridays

Postgraduate Lectures in Edinburgh

The following Honyman Gillespie lectures will be given on Thursdays, at 4 30 P M, at the Edinburgh Royal Infirmary during the summer term April 23, Dr I Simson Hall, progressive middle ear deafness, April 30, Dr F E Reynolds, concerning cancer, May 7, Mr R C Alexander, prostatic enlargement, May 14, Mr W O Kermack, D Sc, recent advances in chemotherapy, May 28, Mr G L Alexander, surgical lesions of the spinal cord and nerve roots, June 11, Dr Douglas Kerr, delinquency The lectures are open to all graduates and senior students

Medical Casualties

Lieut -Colonel C O Shackleton, M B Durh, R A M C, has been officially reported missing after the fall of Hong-Kong

WS/Captain A R Duff, M B Edin, R A M C, who was previously posted as wounded is now reported to be a prisoner of war

Medical Honour

Temp Surgeon Lieutenant D C Jackson, M B Melb, R N V R, was among those awarded the D S C for daring and resolution while serving in daylight attacks on the *Scharnhorst, Gneisenau* and *Prinz Eugen*

London Association of the Medical Women's Federation

A meeting will be held at 3 30 P M on Friday, April 17, at BMA House, Tavistock Square, W C 1, when Dr R D Lawrence will speak on modern treatment with insulin

Transfer of VD Educational Work

The British Social Hygiene Council has agreed that its educational work for the prevention and treatment of venereal diseases shall be transferred to the Central Council for Health Education The Central Council is taking over staff and equipment so that the work may be continued without a break The Minister of Health suggests that local authorities should transfer their contributions towards this work from the British Social Hygiene Council to the Central Council

Course for the DPM

The Maudsley Hospital medical school is holding a course for the DPM from April 13 to June 5 Lectures on psychopathology and the principles and practical application of psychotherapy and on the pathology of the nervous system will be held at the Maudsley There will also be clinical demonstrations at Banstead Hospital, St Ebba's Hospital, Horton Emergency Hospital, and at West Park Hospital Further particulars will be found in our advertisement columns

---

Dr G I Evans has been appointed Sheriff for Caernarvonshire

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export

Births, Marriages and Deaths

BIRTHS

BEHRMAN —On March 25 in London, the wife of Dr Simon Behrman, of Harley Street—a daughter

CHAMBERLAIN —On April 3, at Farnham, the wife of Dr J Chamberlain—a daughter

DANIEL —On March 30, the wife of Dr T M Daniel, of Sevenoaks—a son

HANSON —On April 2, at East Sheen, the wife of Captain E H Hanson, R A M C —a son

HINDS HOWELL —On April 3, in London, the wife of Major Anthony Hinds Howell, R A M C —a daughter

OLLERENSHAW —On April 2, at Altrincham, the wife of Surgeon Lieutenant Gerald Ollerenshaw, R N V R —a son

O'SULLIVAN —On March 31, in London, the wife of Mr J V O'Sullivan, F R C S —a daughter

PORTER —On March 27, at New Milton, the wife of Captain Hugh Porter, R A M C —a son

STAFFORD —On March 26, at Sanderstead, the wife of Dr Austin Stafford—a daughter

WILLIAMS —On March 31, at Plymouth the wife of Surgeon Lieutenant Commander A Emlyn Williams, F R C S, R N V R —a son

MARRIAGES

DESMARAIS—KING —On April 2, at Liverpool, Max Hervé Leopold Desmarais captain R A M C, of Curepipe, Mauritius, to Laura King, of Cheam, Surrey

DEATHS

BROUGH —On April 1, at Marlow, Battle, Daniel Brough, M B EDIN, D P H, aged 69

FORSDIKE —On March 29, at Bickenhall Mansions, London, W 1, Sidney Forsdike, M D EDIN F R C S

McNEILL —On April 1, at Whickham, Newcastle on Tyne, George McNeill, M B EDIN, F R C S E, aged 64

RILOT —On March 30, at West Worthing, Charles Frederick Rilot, M R C S, L D S, aged 77

TAIT —On March 30, at Towcester, Northants, Ralph Johnston Tait, M B EDIN, D P H, aged 54

WARNER —On March 28 at Market Drayton, Salop, Thomas Warner, M D LOND F R C S

WILLIAMS —On March 26, at Prestatyn, Alfred Ernest Williams, M D EDIN D P H, medical officer of health for Flintshire, aged 65

Notes, Comments and Abstracts

CHRISTIANITY, REASON AND DEMOCRACY

THE new Archbishop of Canterbury is not only the most prominent churchman but also one of the most lucid and influential thinkers of the day In the opinion of Sidney Dark he has "*nailed the red flag to the ecclesiastical mast*" In 1941 he summoned a conference at Malvern which called for the abolition of private ownership of land and of the means of production, and asserted that the existing capitalist system is a "predisposing cause of war" In a pamphlet[1] of less than 40 small pages he now examines the relationship of democracy, reason and Christianity He deplores the flight from reason, and discovers the causes for its exclusion from various forms of present-day political sovereignty Only democracy, he concludes, can bear the weight of reason as a unifying force, but democracy and reason alone are quite insufficient to control man's enormous *capacity for selfishness—a selfishness which should never* be ignored in framing any political end Reason does, however, enable us to be sensible of the other man's or nation's egoism and teach us to do justice to that egoism Christianity has, he affirms, been always rooted in reason and is fully aware of man's egoism "The Word was made flesh," not spirit, but it seeks to overcome that egoism by affirming the divine, not human, brotherhood "Brotherhood, brotherhood," said Clemenceau, "yes, of course, Cain and Abel, Cain and Abel" But even those aware of the divine Fatherhood as reason for believing in a divine brotherhood worth striving for must never be unaware of the practical difficulties of a working Christianity, even in a democracy where authority derived from reason could be granted It is a small work packed with thought on three immense subjects, but the end is mainly a plea to would-be practising Christians to use their reason and judgment to the utmost, and having used them to exercise forbearance with others who through the use of the same small powers have come to entirely opposite conclusions

EVOLUTIONARY PROSPECTS

TIME was, the dinosaurs thought themselves the last word in evolution, but nature went on with her old game of "rub it out and do it again" With the hypermetropia natural to geologists, whose time scale is in millions of years, Prof Eliot Blackwelder ("Science and Human Prospects" London Watts & Co Pp 32 6*d*) looks into the distant future and tries to guess what is in store for us in another epoch He points out that although primitive man has evolved continuously from cave man to civilised man, it does not follow that this *evolution will continue on and on and up and up* Human palæontology indicates that what we loosely refer to as man comprised a group of at least five, and probably eight or more, distinct animal species grouped in several genera These originated in various parts of the world, each lived many tens of thousands of years, but with one exception all became extinct Today only one species survives and has held the field since the middle of the last glacial epoch, about 40,000 years ago Other animal species of the past have followed career curves that involved a rise, culmination and decline Fish, reptiles and giant birds were each in their turn lords of creation, but each was evicted by an upstart species, hitherto insignificant, but possessing those capacities of development that enabled it to adapt more successfully to a changing environment Will our own species also reach its climax and deteriorate while a new species rises? Despite his progress in ways and ideas, man's actions are still governed more by his emotions than by his intellect Professor Blackwelder guesses that man's successor will be able to absorb knowledge more rapidly and remember it better, he will have a keener imagination and be able to reason out his problems more effectively—and his life will be controlled by his intellect rather than his feelings We shall not live to see the professor proved right, and man ousted from the scene by a superman, but in this present year of grace mankind appears to be anticipating both history and the professor, and is busy exterminating itself

---

[1] "Christian Democracy" William Temple Archbishop of York London Student Christian Movement Press Pp 46 6*d*

MALE GONORRHŒA TREATED WITH SULPHAPYRIDINE

SYDNEY M. LAIRD, M.D. GLASG., F.R.F.P.S., D.P.H.
MAJOR R.A.M.C.
VENEREAL DISEASES OFFICER AT A SPECIAL TREATMENT CENTRE

THIS paper reports an attempt to determine a standard course of treatment most suitable for the inpatient therapy of gonorrhœa in Service patients. Such a course must satisfy certain basic requirements—namely, rapid clinical cure, the avoidance of serious toxic effects, a low rate of complications and relapse, and the early discharge from hospital of a man fit for the full duties of active service. Since some of these considerations also apply to civil practice, particularly to patients engaged on war work, the findings of the investigation here reported may be of general interest. No attempt is made to refer to the published work on the chemotherapy of male gonorrhœa, in which few contributions make any real attempt to outline an optimum course of treatment.

MANAGEMENT OF CASES

The clinical material comprises 764 cases of acute gonococcal anterior urethritis. All patients were Service men, the vast majority being otherwise physically fit and between 18 and 30 years of age. All cases were treated in hospital and every patient was examined personally each day. Accurate observation and standardised recording can therefore be claimed. When severe vomiting complicated chemotherapy the patient was permitted to be in bed, otherwise all patients were up and did fatigues during the morning and afternoon. The daily inspection took place 3 hours after the voiding of the first morning specimen of urine and before urethral lavage.

Lavage was carried out under supervision twice daily, and consisted of posterior irrigation with a 1/8000 solution of potassium permanganate at 105° F. Sulphapyridine tablets were swallowed whole or crushed according to the patient's taste and washed down with water. This procedure was also supervised to ensure that the prescribed tablets were taken. The dosage of sulphapyridine and the fluid intake used in various groups of cases are detailed later.

Chemotherapy was begun on the day of admission, while urethral lavage, if prescribed, started next day. Clinical cure was recorded on the first morning on which the patient was free from urethral discharge and presented a urine free from pus and shreds. As soon as the course of sulphapyridine was completed and clinical cure had been recorded the patient received his first test of cure. This entailed the passage of a metal bougie into the bladder, massage of the anterior urethra over the bougie, palpation and massage of the prostate, vesicles and glands of Cowper, and microscopic examination of the expressed secretions. If the patient presented a normal urine and no urethral discharge on the morning after this examination, arrangements were completed for his discharge from hospital next day. In computing the average number of days in hospital the day of admission and discharge are included as whole days.

After his discharge from hospital the patient is supervised as follows: three examinations are made, including prostatic smear, at weekly intervals; final tests follow three months after discharge from hospital. Supervision may be carried out in different centres but the minimum final test which is accepted demands the absence of urethral discharge, a normal urine, passage of a metal bougie to the bladder, massage of the anterior urethra over the metal bougie, palpation and massage of the prostate, vesicles and glands of Cowper, microscopic examination of the expressed secretion and a blood test to exclude syphilis. In many centres the final test may also include anterior urethroscopy, examination of the deposit obtained by centrifuging the first morning specimen of urine, provocation by vaccine and the gonococcal complement-fixation test.

The routine use of cultural methods, unfortunately, is exceptional. When the reports are unsatisfactory the patient is readmitted to the Service V.D. hospital. In the present investigation a case was regarded as a failure in any of the following circumstances: where clinical cure was not established within 10 days of the start of chemotherapy; where any prostatic smear was abnormal; where relapse occurred; where any abnormality was detected in the urethra or its communicating glands; and in any case developing complications during or following treatment. The considerable number of cases which, although classified as failures for the purposes of this study, completed the supervised tests without further treatment testifies to the stringency of the standard adopted. For various reasons it has proved impossible to follow up all the patients of this series and a record of the satisfactory completion of final tests of cure is not available in every case; but there is good reason to suppose that information has been received concerning nearly all cases in which subsequent reports were unsatisfactory.

TREATMENT AND RESULTS

Six separate schemes of treatment have been used:

Series A.—1 g. sulphapyridine was given at 8 A.M., 12 noon, 4 P.M. and 8 P.M. daily for 6 days (24 g.); the daily fluid intake was 7 pints and urethral irrigation was used.

Series B.—The same as A except that irrigation was omitted.

Series C.—The same as B, but the fluid intake was restricted to 3 pints daily.

Series D.—Sulphapyridine, 1 g., was given 4-hourly for 4 days (24 g.) without irrigation and the fluid intake was 3 pints daily.

Series E.—The sulphapyridine dosage was the same as in D but irrigation was used and the fluid intake was 7 pints daily.

Series F.—The same as E but sulphapyridine was stopped after 3 days (18 g.).

Except as indicated above all circumstances in these six groups were comparable. Results are presented in the accompanying table.

RESULTS FROM SIX DIFFERENT SCHEMES OF TREATMENT

Series	Sulphapyridine (g. daily)*	Fluid intake (pints daily)	Irrigations	Total cases	Cures (%)	Failures (%)	Average days for clinical cure	Average days in hospital	Early relapse (%)	Late relapse (%)	Further treatment needed (%)	Complications during chemotherapy %	Complications after chemotherapy %	Microscopic prostatitis (%)	Vomiting (%)	Hæmaturia (%)
A	4 (6)	7	Yes	163	84	16	4	9	2	4	27	2	0.6	9	8.5	0
B	4 (6)	7	No	102	84	16	4.3	8.6	6	5	30	0	1	4	9.5	0
C	4 (6)	3	No	86	84	16	5.3	8.5	2	1	71	5	1	5	12.5	1
D	6 (4)	3	No	112	81	19	4.7	7.4	5	3	75	0	0	4.5	13	2
E	6 (4)	7	Yes	230	91	9	4.4	7.1	2	1	37.5	0.4	0.4	6	8	0.3
F	6 (3)	7	Yes	71	84.5	15.5	5	7.3	0	3	57	0	0	11	13	3

* Number of days in parentheses

DISCUSSION

The rates for cure and failure were remarkably constant in 5 groups, and the cure-rate in series E was slightly higher than the general level The average time required for clinical cure varied between 4 and 5 3 days Of the 5 groups in which sulphapyridine dosage totalled 24 g the time of cure was longest in groups C and D, where irrigation was withheld and fluid intake was restricted Comparison of the results in series A and B, in which dosage and fluid intake were similar, reveals that irrigated cases achieved clinical cure sooner than those treated without urethral lavage The average time in hospital was influenced largely by the duration of the course of chemotherapy Cases of relapse have been divided into late and early relapse, as described in a previous paper[1] Early cases relapse soon after the completion of chemotherapy while late cases may relapse several weeks or months after treatment and initial tests of cure The incidence of early relapse was small in all groups but was lowest in those patients receiving irrigation, a high fluid intake and sulphapyridine, 4-hourly (series E and F) The incidence of late relapse was satisfactory, being lowest in series E

From a study of the percentage of failures in which further treatment was necessary to obtain cure, it appears that a low fluid intake is unfavourable and that a total of 18 g of sulphapyridine is less satisfactory than 24 g Complications arising during chemotherapy were insignificant except in series C where the fluid intake was low. They were inflammation of Tyson's glands, periurethral abscess, and 1 case (in series A) with periurethral abscess, conjunctivitis and tenosynovitis, 2 cases each of acute posterior urethritis and acute tenosynovitis in series C, and 1 case of synovitis in series E

The high incidence of acute posterior urethritis in group C—in which irrigation and a high fluid intake were lacking—is of interest Acute complications developing after chemotherapy were rare and comprised 1 case of periurethral abscess (series A), 1 case of inflammation of Tyson's glands (series C), and 2 cases of acute tenosynovitis (series B and E) Microscopic prostatitis was diagnosed in all 6 groups after chemotherapy but was more common in those patients receiving urethral lavage In addition, some cases were found during the initial test to have chronic structural changes indicative of previous infection (e g, stricture, palpable glands of Cowper, and abnormal shape, size or consistency of the prostate and vesicles). Vomiting and hæmaturia occurred as shown in the table and were the only troublesome toxic manifestations Vomiting is the great bugbear of heavy sulphapyridine dosage, since it may lead to dehydration and the onset of hæmaturia The cause, treatment and prevention of the latter have been described elsewhere[2] The need for a high fluid intake in cases receiving chemotherapy must again be emphasised

SUMMARY

A suitable course of inpatient treatment for acute anterior gonococcal urethritis in Service men is described

Six schemes of treatment employed in the total series of 764 cases are set out

The best results followed 4-hourly doses of 1 g of sulphapyridine over a period of 4 days

Urethral lavage and a high fluid intake were of benefit in reducing the number of failures, the time necessary for clinical cure, the rate of early relapse, and the incidence of acute complications during and following chemotherapy

I wish to thank the officer commanding this military hospital for permission to publish the results

---

[1] *Brit med J* 1940 i, 967 [2] *Lancet* 1941, ii 272

HEBERDEN MEDAL—The Heberden Society has decided to make a special award of this medal, with an honorarium of twenty guineas, for original work on the problem of low back pain, with or without sciatic neuralgia, which represents an advance in treatment likely to lead to a reduction in the period of disability Theses should be submitted to the secretary of the society, c/o the BRCS Clinic for Rheumatism, Peto Place, London, N W 1, before Dec 25, 1942

BLOOD CONCENTRATIONS DURING CHEMOTHERAPY OF GONORRHŒA

R W FAIRBROTHER
M D, D SC MANC, F R C P
MAJOR R A M C

C A AYMER
M B ABERD
CAPTAIN R A M C

C W ASHTON, SENIOR TECHNICIAN

(*From a Military Hospital*)

THERE is general agreement that the sulphonamide compounds, particularly sulphapyridine, are highly successful in the treatment of acute gonococcal infection. There does not, however, seem to be general agreement on the question of dosage for routine application Some workers (e g Prebble 1940, Taylor 1940, Sommerville 1941) have obtained satisfactory results with relatively small doses given for long periods, such as 25–30 g in 10–14 days Recently there has been a tendency to adopt more intensive courses, King and Williams (1941) have given 23 g in 72 hours, while MacKenna (1941) has advocated even more concentrated dosage—22 g in 48 hours In these intensive methods emphasis is given to the importance of initial massive doses followed by smaller doses at regular 4-hourly intervals throughout the day and night It is noteworthy that, with all these schemes, a small percentage of cases have almost invariably failed to respond to treatment they have proved sulphonamide-resistant

In view of these discrepancies we decided to determine, in a consecutive series of proved cases of acute gonorrhœa, the concentration of sulphapyridine in the blood after various schemes of dosage and to correlate these findings with the clinical results

TECHNIQUE

The diagnosis was established in all cases before treatment began by demonstration of the gonococcus in urethral smears

Routine dosage—The routine course of sulphapyridine was that recommended by MacKenna (1941), 22 g being administered in 48 hours at 4-hourly intervals during the day and night

The first four doses were successively 5, 4, 3 and 2 g, and the remaining eight doses were each 1 g The tablets were crushed and given with a little water During this period the patients were kept in bed under close observation, denied food and given a large amount of water to drink (a minimum of 10–12 pints in 24 hours), smoking was prohibited and any tendency to constipation was corrected Sodium citrate, gr 30, was given 2 hours after the tablets, because the tendency to nausea was accentuated when this was taken with, or immediately after, the tablets, this practice was not strictly enforced however

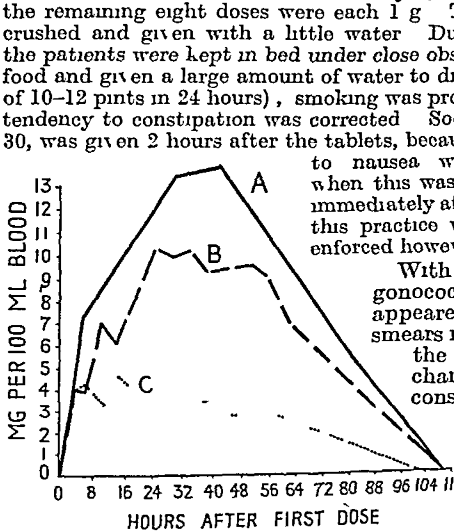


FIG 1—Concentration of sulphapyridine with intensive dosage A case with highest values B, average levels of 18 cases C, case with lowest values

With this treatment gonococci usually disappeared from the smears in 24 hours and the urethral discharge decreased considerably in a few days When the discharge persisted, irrigations with 1/10,000 potassium permanganate were instituted In most of the resistant cases the reduction in the number of gonococci seen in urethral smears was temporary, lasting a few days only

Tests for cure—Evaluation of cure in cases of gonorrhœa is difficult and it is necessary to carry out a comprehensive series of tests in order to exclude the presence of residual infection Complement-fixation tests, advocated by some workers, were not done, since the results are often valueless, but the following tests were used

1 Urethral smears, obtained before the morning specimen of urine was passed, were examined daily, in particular for pus cells or gonococci

2 Two glass test The bladder not having been emptied for at least 6 hours, the morning sample of urine was passed into two glasses and examined macroscopically, mainly for the presence of threads If on 2 consecutive days the urine was clear and urethral smears could not be obtained, more searching tests for cure were carried out

3 Examination of prostate, vesicles and smear of prostatic exudate If this was satisfactory and remained so for 2 days, further tests were made

4 Anterior urethroscopy

5 Four glass test and examination of prostatic smear

If these tests proved satisfactory, the patient was kept under observation for a further 2 days and then discharged to his unit The minimum time in which a patient could be discharged was consequently 9 days At the end of 3 months all cases reported for their final tests for cure

Estimation of blood concentrations —A modification of the method introduced by Werner (1939) was used The reliability of this method has been confirmed for the estimation of free sulphapyridine when more than 2 mg per ml are present (Andrews and Strauss 1941) Morris (1941), however, considered that it was unsatisfactory for the estimation of the acetylated product, he criticised the method because the precipitation of the blood proteins was not satisfactory and the results were subject to variation from pH fluctuations In order to overcome these objections the following technique has been used in this investigation

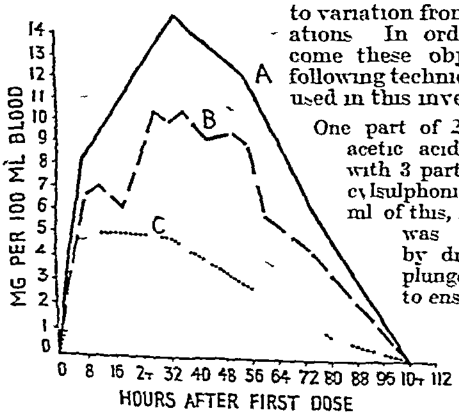


FIG 2—Concentration of sulphapyridine with modified dosage A, highest case B, mean of 21 cases C, lowest case

One part of 20% trichloracetic acid was mixed with 3 parts of 3% salicylsulphonic acid, to 9 ml of this, 1 ml of blood was added, drop by drop, a glass plunger was used to ensure thorough mixing, and the tube was inverted about five times The mixture was centrifuged for 10 min To 4 ml of the supernatant fluid were then added to 2 5 ml of disodium hydrogen citrate and 1 ml of 3% dimethylaminobenzaldehyde In the presence of free sulphapyridine a yellow colour was produced which was immediately maximal and stable Comparison was made in a colorimeter with standard 5% and 10% solutions of pure sulphapyridine which had been subjected to an identical form of treatment

BLOOD CONCENTRATIONS OF FREE SULPHAPYRIDINE

1 *Routine course* —Samples of blood were collected at different stages during the intensive course, in some cases as many as 13 samples were taken, the first ½ hr before the drug was administered and the others at regular intervals (usually 4 or 8 hours) for several days Estimations of the blood concentration were made by a modification of the Werner technique In the early stages both free sulphapyridine and the acetylated product were estimated but since the method for the estimation of acetylated sulphapyridine has been criticised and since this product is ineffective as an antibacterial factor, its estimation was abandoned In all, 125 estimations have been carried out on 18 patients The average results are given in fig 1, together with curves of the cases giving the highest and lowest values There was considerable individual irregularity in the degree of absorption as evidenced by the differences shown in these curves As a general rule absorption was rapid and tended to reach a maximum in 32–36 hours, in most cases blood concentrations of 8 mg per 100 ml or over were maintained for 36–44 hours After the administration of the drug had ceased the high levels were maintained as a rule for some 8 hours, after which the concentrations fell quickly though elimination was not complete for 56 hours It is noteworthy that the patient giving curve C made a good recovery and was discharged from hospital in 17 days

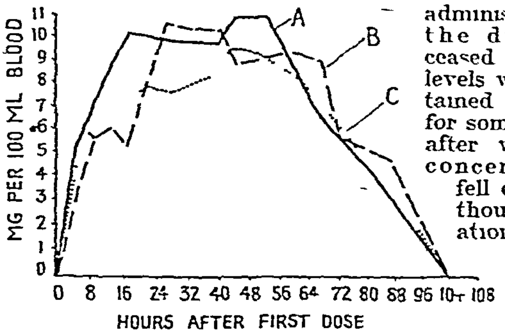


FIG 3—Concentration curves A mean of 23 cases on modified dosage B mean of 19 cases on intensive dosage C, mean of 6 resistant cases

2 *Modified dosage* —Some cases with high blood concentrations did not respond well clinically, while others with low blood levels cleared up rapidly In a series of cases the dosage of sulphapyridine was therefore reduced, 18 g, instead of 22 g, was given in 48 hours the first two doses being 3 g, the third and fourth 2 g and the remainder 1 g In this group of cases 115 estimations were made on 21 patients The average results are given in fig 2, together with those of the cases giving the highest and lowest values There was much individual variation in the levels obtained but the results were mostly in close agreement with those given by the routine course In the majority of cases a concentration of 8 mg or over was maintained for 36–44 hours The highest reading obtained was 14 8 mg per 100 ml, with the routine course this was 14 mg

BLOOD CONCENTRATION CORRELATED WITH CLINICAL RESULTS

Patients were divided into two groups one receiving the routine course of 22 g and the other the modified dosage of 18 g The number of cases investigated was not large but the results confirm the biochemical observations in that there was little difference in the effects of the two courses (see table) In both groups the results were satisfactory and showed a slight improvement on those achieved in earlier courses (Jones and Fairbrother 1941)

DAY OF DISCHARGE FROM HOSPITAL AFTER TREATMENT

Treatment	No of cases	Days in hospital		
		< 15	15–21	>21
Intensive course	88	35 (40%)	37 (42%)	16 (18%)
Modified course	52	24 (46%)	20 (39%)	8 (15%)

Refractory cases —A small percentage of cases do not respond well to chemotherapy and these are considered to be sulphonamide-resistant It has been suggested that, in these cases absorption of the drug is incomplete and an effective level in the blood is consequently not obtained During this investigation 6 such refractory cases were under observation In only 1 case was absorption poor, in the other 5 high levels were maintained for some time The curve of the average levels together with those of the averages given by all cases on the intensive and modified courses is shown in fig 3 The curves are similar and indicate that the ineffectiveness of sulphapyridine in the refractory cases was not due to failure of absorption It is interesting that in all these cases the infection had spread from the anterior urethra and involved the posterior urethra and prostate

DISCUSSION

Intensive dosage with sulphapyridine in cases of acute gonorrhœa usually produces a high concentration of the free drug in the blood which is maintained from 36–48 hours High blood concentrations can also be produced by smaller doses of the drug than those advocated The results, biochemical and clinical obtained by the administration of 22 g in 48 hours were closely analogous to those given by a dosage of 18 g in the same time

There are, moreover, indications that even the smaller dosage is too great, as several cases with concentration curves, appreciably lower than the average, showed excellent clinical results This is not altogether surprising since it has already been demonstrated that greater absorption does not necessarily result from increased dosage with sulphapyridine (Long and Feinstone 1938) High concentrations of sulphapyridine may not be essential for the inhibition of the gonococcus, which is a delicate organism, difficult to culture and maintain under artificial conditions Experiences with other infections have demonstrated that there is no strict correlation between rapidity of cure and the blood-level Hobson and MacQuaide (1938) reported that, in cases of meningococcal meningitis, a concentration of 3 mg per 100 ml in the cerebrospinal fluid was sufficient to inhibit the organism, Flippin and his co-workers (1939) found that, in cases of pneumonia, patients with blood concentrations of 1–2 8 mg per 100 ml did as well as those with much higher levels

In the chemotherapy of acute gonorrhœa dosage has usually been determined on empirical grounds There is a big difference between the intensive courses and the earlier methods, in which a dose of 1 g three times a day was common, with all schemes good results have been obtained The main advantage of intensive therapy is probably the regular dosage at 4-hourly intervals, since it is generally accepted that regular dosage is necessary to maintain a persistently high level of blood concentration The optimal effective level for cases of acute gonorrhœa has not yet been determined but the results of this investigation indicate that the large initial doses of the intensive course are unnecessary Harrison (1941) has already suggested that much of the drug given in the intensive schemes might possibly be wasted, since several continental workers have claimed excellent results from small dosage given over short periods, in one small series a single dose proved successful

The failure of certain cases to respond to treatment is not altogether surprising since acute gonorrhœa is a purulent infection often involving the posterior urethra and prostate, where the formation of minute abscesses is not uncommon The results given above indicate that lack of absorption of sulphapyridine was not responsible for the failure to cure the resistant cases It should not, however, be assumed that in these cases the gonococcus had become sulphonamide-resistant, since the organisms were probably protected from the action of the sulphapyridine by the purulent exudate Under such conditions it is generally agreed that the action of the sulphonamides is greatly impaired

SUMMARY

Intensive dosage with sulphapyridine has given satisfactory results in the treatment of acute gonorrhœa Clinical and biochemical observations, however, indicate that the initial massive doses given in the course are unnecessary Cases proving resistant to sulphonamide therapy were found to give levels of blood concentration comparable with those of successfully treated cases

We wish to thank Corporal Lawrence and Corporal Turnbull for their assistance during this investigation

REFERENCES

Andrews, M C, Strauss, A F (1941) *J Lab clin Med* **26**, 887
Flippin, H, Lockwood, J S, Popper, D S and Schwartz, L (1939) *J Amer med Ass* **112**, 529
Harrison, L W (1941) *Brit J vener Dis* **17**, 228
Hobson, F G and MacQuaide, D H G (1938) *Lancet*, ii, 1213
Jones, H B and Fairbrother, R W (1941) *Ibid* ii, 9
King, A J and Williams, D I (1941) *Brit J vener Dis* **17**, 202
Long P H and Feinstone, W H (1938) *Proc Soc exp Biol Med*, *N Y* **39**, 486 MacKenna R M B (1941) *Brit med J* i, 958
Prebble, E E (1940) *Ibid*, i, 89
Morris, C J O (1941) *Biochem J* **35**, 952
Sommerville, J (1941) *Brit med J* i, 961
Taylor, N S (1940) *Ibid*, i, 88 Werner, A E A (1939) *Lancet*, i 18

Sheffield Radium Centre—A gift of £100,000 from Alderman J G Graves, an ex lord mayor of Sheffield, will turn the present centre with headquarters at the Royal Infirmary into a self contained special hospital after the war The work now being done in several different hospitals will thus be brought under one roof where the best modern equipment will be available Patients come to the centre for radium treatment from South Yorkshire, and the adjoining counties of Derby, Lincoln and Notts,

---

PEPTIC ULCERATION

RESULTS OF MODERN TREATMENT

B. M Nicol, M B Aberd
MAJOR R A M C, LATE CARNEGIE TEACHING FELLOW AT EDINBURGH UNIVERSITY, CLINICAL TUTOR IN THE ROYAL INFIRMARY

An attempt to reduce the concentration of free hydrochloric acid in the gastric contents has been the chief aim of medical treatment for peptic ulceration for over fifty years Well-known diets of various composition, given as small feeds at frequent intervals, and designed to combine with free hydrochloric acid, have been used since the end of the nineteenth century (Leube 1876 Lenhartz 1904, Sippy 1915, Hurst 1920) Alkalis and antacids have been employed to neutralise acid, and the belladonna group of drugs and olive and almond oils to inhibit its secretion Surgeons have devised methods to by-pass acid away from the ulcerated areas, and to allow the alkaline secretions of the duodenum, the pancreas and the liver to mix with the gastric contents, or they have resected the acid-secreting portions of the gastric mucous membrane

Such methods of treatment are often considered very satisfactory, and this may be true of the immediate results When, however, groups of patients are examined some years after discharge from hospital a different state of affairs is revealed, and the frequency of relapse is demonstrated (Russell 1904, Friedenwald 1912, Nielsen 1923, Crohn 1927, Tidy 1936, Emery and Monroe 1936) This paper reports a study of 435 patients suffering from peptic ulceration admitted to two medical wards of Aberdeen Royal Infirmary between 1927 and 1936 The presence of an ulcer was proved radiologically, at operation or at autopsy The investigation was carried out between 1937 and 1939 under the direction of Prof L S P Davidson

MATERIAL

The average age of the patients at the onset of symptoms was 32 5 yr In all, 387 (89%) patients were successfully traced and examined Some had undergone an operation on the stomach or duodenum before admission to the medical wards, and others were transferred from medical to surgical wards for operation Therefore the results have been reported in "medical" and "surgical" groups, the former containing 320 cases, the latter 115 Cases of perforation dealt with by simple closure and subsequent medical treatment are included in the former group

The hospital records showed that before discharge from hospital radiological evidence of healing was found in 201 of the 389 patients successfully traced In the remaining 119 patients discharged free of symptoms healing was not radiologically verified Of the 86 patients discharged from hospital still suffering from dyspepsia evidence of healing was present in 13 cases, the ulcer crater was still demonstrable in 17, and in the remaining 56 there was no record that a radiological examination had been carried out before the patient was discharged

Nielsen (1923) has published figures which indicate that if an accurate estimate of the late results is to be obtained, the minimum period of follow-up should be two years, and should extend for ten years The condition of the patients in this series was studied (*a*) on discharge from hospital ("immediate" results) and (*b*) at examinations carried out from two to twelve years after discharge ("late" results), the average time, to the nearest half-year, being four years The periods between discharge from hospital and the follow-up examination were as follows

RESULTS

Years	*2–4*	*4–6*	*6–8*	*8–10*	*10–12*
No of cases	184	127	33	23	20

The patients have been classified into five groups according to the course of the disease since discharge from hospital

1—No symptoms, *on full work and full diet*
2—No symptoms if careful with diet, on full work
3—Improved, but some dyspepsia, even if on diet
4—Not improved, frequently off work,
5—Dead,

TABLE I—IMMEDIATE AND LATE RESULTS IN ALL PATIENTS

Group	Immediate		Late		Mean follow up (yr.)
	No.	(%)	No.	(%)	
1	320	73·6	73	18·9	4
2			84	21·7	3·5
3			75	19·4	5
4	86	19·7	89	22·9	3·5
5	29	6·7	66	17·1	4
—	435	100	387*	100	—

* Remainder not traced.

The immediate and late results for all patients are shown in table I. It is worth noting that 320 (73·6%) were discharged free of symptoms, 86 (19·7%) were not improved by treatment, and the immediate mortality was 29 (6·7%). At the examination from two to twelve years later the number remaining symptom-free had fallen to 73 (18·9%), and those patients forming groups 2 and 3 amounted to 159 (41·1%). In the interval 66 of the patients had died, 24 of these deaths being due directly to the ulcer, and 19 to some other disease; in 23 cases the cause of death was not discovered.

The number of patients suffering from gastric ulcer in this series was small (54), but when the results for gastric and duodenal ulcer were examined separately the late results for gastric ulcer were much worse, and the mortality much higher, than for duodenal ulcer.

In table II the figures for the immediate and late results following medical and surgical treatment are shown separately. Surgical treatment is responsible for the biggest proportion of the best results (i.e., group 1) but if groups 1, 2 and 3 are considered together there is no significant difference between the medical and surgical figures, 60·6% and 57·8% respectively.

The great majority of patients suffering from severe hæmatemesis were treated medically, and many patients were selected in medical wards as being suitable for surgical treatment—e.g., long-standing cases of organic pyloric stenosis. A comparison of the results in 128 patients in the medical group and 50 in the surgical group whose cases were uncomplicated either by hæmorrhage or by obstruction shows that there is no significant difference between the immediate medical and surgical results (table II). As regards the late results, a higher percentage of the best (group 1) follows surgical treatment in uncomplicated cases, but the figures are not statistically significant. After medical treatment a bigger number of patients fall in groups 2 and 3, however, and a smaller number in group 4, than after surgical treatment. There is no significant difference in mortality between medically and surgically treated patients.

Gastroenterostomy for pyloric stenosis has always been considered a satisfactory operation. A higher percentage of group 1 results (28·3%) and of groups 1, 2 and 3 results (82·7%) follows this operation for stenosis than is obtained in any other type of case by any form of treatment. The number of patients suffering from organic pyloric stenosis who are not improved by this operation is very small (table III).

TABLE III—LATE RESULTS OF GASTROENTEROSTOMY IN CASES OF STENOSING AND NON-STENOSING PEPTIC ULCER

Group	Stenosing			Non stenosing		
	No.	%	Follow-up (yr.)	No.	%	Follow up (yr.)
1	13	28·3	4	8	25·8	4
2	13	28·3	3·5	4	12·9	3·5
3	12	26·1	3·5	5	16·1	8
4	3	6·5	6	12	38·7	5
5	5	10·8	8	2	6·5	5
—	46	100	—	31	100	—

It is obviously important to study any factors which may influence the course of the disease, in view of the depressingly large number of relapses which occur, whether medical or surgical treatment is employed.

FACTORS INFLUENCING IMMEDIATE RESULTS

Acid factor.—Evidence has been published already (Nicol 1939) to show that peptic ulcers heal satisfactorily in spite of high concentrations of free hydrochloric acid in the gastric contents. Hourly or two-hourly feeds of milk or milky foods, combined with doses of olive oil, alkalis and belladonna, as recommended by Hurst (1929), do not control gastric acidity over 24-hour periods any more satisfactorily than diets consisting of four meals a day. Recently Smith (1941) has confirmed these findings.

TABLE IV—THE EFFECT OF OPERATION ON GASTRIC ACIDITY IN STENOSING AND NON STENOSING ULCER

—	Group	Number	Average years after operation	Mean max. free HCl (Ewald units)							
				Before operation				After operation			
				Sten.		Non-sten.		Sten.		Non-sten.	
				No.	Acid	No.	Acid	No.	Acid	No.	Acid
Gastro-enterostomy	1	12	3·5	7	24	5	52	7	42	5	50
	2	8	4	4	44	4	60	4	30	4	54
	3	13	4·5	6	66	7	70	6	77	7	67
	4	8	4·5	6	62	2	46	6	39	2	41
Gastrectomy	1	4	3·5	70				24			
	2	3	2·5	89				60			
	3	2	4·5	76				39			
	4	1	3	72				0			
Pyloroplasty	1	0									
	2	2	4·5	43				36			
	3	1	8	57				56			
	4	2	6·5	38				46			

Sten. = stenosing.

The effect of surgical operations on gastric acidity have been studied by comparing the preoperative readings with the postoperative findings at the follow-up examination, and these are shown in table IV classified according to the results of treatment. A reduction in the concentration of free hydrochloric acid, if it occurs, apparently bears little relationship to the clinical improvement produced by the operation, whether the case is one of stenosing or non-stenosing ulcer. The only deduction to be made from these figures is that some

TABLE II—IMMEDIATE AND LATE RESULTS OF MEDICAL AND SURGICAL TREATMENT

Group	ALL CASES										UNCOMPLICATED CASES									
	Medical					Surgical					Medical					Surgical				
	Immediate		Late		Mean follow up (yr.)	Immediate		Late		Mean follow up (yr.)	Immediate		Late		Mean follow up (yr.)	Immediate		Late		Mean follow up (yr.)
	No.	%	No.	%		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%	
1	227	70·9	42	15·1	3·5	93	80·8	31	28·5	4	120	80·5	21	16·4	4	46	82·1	14	28	3·5
2			65	23·4	4·5			19	17·4	5			25	19·5	5			2	4	4
3			62	22·1	3·5			13	11·9	4·5			39	30·5	3·5			6	12	4
4	72	22·5	59	21·5	4	14	12·2	30	27·5	3	28	18·8	26	20·3	3·5	8	14·3	22	44	5
5	21	6·6	50	17·9	4·5	8	7	16	14·7	4·5	1	0·7	17	13·3	4·5	2	3·6	6	12	4
	320	100	278*	100		115	100	109*	100		149	100	128*	100		56	100	50*	100	

* Remainder not traced.

factor influences the symptoms and healing to a greater extent than does free hydrochloric acid

Motor factor —It has been suggested that frequent small feeds reduce the motor activity of the stomach, and so assist healing of the ulcer Radiological investigation of many of these patients did not confirm this finding Gastric movements were least, for a period up to three hours, after a normal sized meal A similar diminution of motility was never seen when the patients were on frequent small feeds When 5 oz of milk or milk pudding, and antacids and belladonna are given to patients suffering from peptic ulcer it has been found that the bulk of each feed has left the stomach within 20–40 minutes Larger feeds of more solid pureed food remain in the stomach for a longer time, up to three hours (Nicol 1939) These findings indicate that frequent small feeds do not inhibit gastric motility as satisfactorily as larger meals given at longer intervals

FACTORS INFLUENCING LATE RESULTS

Age at onset of symptoms —During this investigation it was found that the earlier in life a patient's symptoms start the better are the ultimate results Of those whose symptoms began before the age of 20 years, 72% were found to fall in groups 1, 2 and 3 at the follow-up examination This percentage fell progressively until, in those patients whose dyspepsia started at 50 or over, the figure was 45% in groups 1, 2 and 3

Duration of symptoms before treatment —The average duration of symptoms before admission to hospital was 7 5 years, being 7 3 years for duodenal and 8 years for gastric ulcer The time elapsing between the onset of symptoms and the start of treatment did not influence the ultimate prognosis significantly This is opposed to the findings of Dunlop and Murray-Lyon (1932) and of Farquharson (1935)

Treatment employed —It has been shown above that an equally high proportion of relapses follows either medical or surgical treatment The biggest number of good results is found after gastroenterostomy in patients suffering from organic pyloric stenosis Very poor results are a sequel to surgical treatment for non-stenosing duodenal ulcers

In this series the medical treatment used from 1927 to 1932 was that recommended by Sippy After 1932 this was stopped in favour of a strict Hurst diet No significant difference was found between the late results of these two methods of treatment In view of this finding, and of Meulengracht's reported success using a much fuller diet, 40 patients with proved ulcers were treated in 1938 and 1939 by rest in bed and a full diet consisting of four meals a day, the only precaution taken being to sieve any rough articles of food The immediate results were as good as, if not better than, those obtained using the stricter methods of dieting Healing was watched radiologically in all these patients, and gastroscopically in two suffering from gastric ulcers The ulcer craters were completely covered by epithelium in six weeks in one and seven weeks in the other The average duration of treatment in hospital for this group of patients was four weeks, the same as for patients on a strict diet and antacids

DISCUSSION

This analysis has shown that 70–80% of patients, after medical or surgical treatment in hospital, are temporarily "cured,"—i e , symptom-free and on full work After a few years only 15–20% will remain "cured," and a further 15–40% will be "improved"—i e , better than before treatment but still suffering from dyspepsia if not careful with their diet

In this series gastroenterostomy was used much more frequently than any other operation The numbers of each type of operation performed on those patients who were successfully traced are as follows —

Gastroenterostomy	71
Gastrectomy	12
Local excision or wedge resection	12
Pyloroplasty	10
Gastroduodenostomy	4 = 109

Thus the possibility that gastrectomy or other operation may lead to a higher percentage of good results than those reported here cannot be dismissed

There appears to be little to choose between the medical and surgical results as a whole, but the good results of gastroenterostomy in cases of pyloric stenosis counteract the bad results of surgery in patients with non-stenosing ulcers This is not a reflection on the surgical treatment of peptic ulcer, but indicates that a poor selection of patients for operation was made in certain cases The results, considered as a whole, suggest that gastroenterostomy should not be performed on a patient with a patent pylorus It is interesting to note, however, that a similar percentage of the best results (group 1) followed gastroenterostomy for stenosing ulcer (28 3%, see table III), gastroenterostomy for non-stenosing ulcer (25 8%, see table III), and also the surgical procedures employed in the treatment of uncomplicated peptic ulcer (28%, see table II) This was a higher percentage of group 1 results than that following medical treatment in these types of case It is only when groups 2, 3 and 4 are considered together that the excellent results of gastroenterostomy for stenosing ulcer stand out, and that medical treatment is seen to be of more value than surgical treatment for patients with ulcers uncomplicated by pyloric stenosis

It has not been possible to demonstrate any clinical feature by which the patients with non-stenosing ulcers who remain "cured" after gastroenterostomy or other operation can be differentiated from those who are liable to relapse, and it has been impossible to differentiate between the patients with a patent pylorus who do well after medical treatment and those in the same category who do badly The histories of the patients in this series, taken at the follow-up examination, showed that the treatment and self-medication employed at home made little difference to the progress of the case Indeed, the patients who did best (groups 1 and 2) were, with a few exceptions, less careful in their dietary regime, and took less in the way of alkalis and antacids, than those whose symptoms persisted (groups 3 and 4)

Neither medical treatment nor gastroenterostomy reduces the concentration of hydrochloric acid in the gastric contents to any appreciable extent After gastrectomy the concentration of hydrochloric acid may be reduced, but the reduction does not seem to be related to the clinical improvement, if any, resulting from the operation In spite of these findings regarding gastric acidity, ulcers heal satisfactorily, and do so whether the patient is on a strict diet, combined with atropine and antacids, or is having four meals a day

The only common factor in the forms of treatment investigated was rest in bed, and there can be little doubt that mental and physical rest is the most important part of the treatment of active peptic ulcer A long history of dyspepsia before treatment is started does not reduce the expectation of improvement, or even of "cure"

SUMMARY

The immediate and late results of treatment of peptic ulceration in 387 patients have been analysed

On discharge from hospital 73 6% of patients, whether treated medically or surgically, were free from symptoms, 19 7% were not improved by treatment, and the immediate mortality was 6 7% After 2–12 years the percentage remaining symptom-free fell to 16 8%, but a further 41 1% remained sufficiently well to be able to work, if careful with their diet

The results of treatment appeared to be slightly better in patients whose symptoms began at a early age

The duration of symptoms before admission to hospital did not influence the prognosis

Gastroenterostomy was highly successful in the treatment of ulcers causing pyloric stenosis, but in cases of non-stenosing ulcer medical treatment was more successful than surgery The number of cases submitted to operations other than gastroenterostomy, however, was too small for definite conclusions to be drawn

I wish to thank Prof L S P Davidson for his help during the investigation and in the preparation of this paper, Dr J Alexander Innes and Dr A W Hendry for access to patients and case records, and Dr J McCrie for valuable criticism

REFERENCES

Crohn B B (1927) Affections of the Stomach Philadelphia
Dunlop D M and Murray Lyon, R M (1932) *Edinb med J* 39 571

Continued at foot of opposite page

ASPIRATION OF PETROL

CUTHBERT LESLIE COPE, D M OXFD, F R C P
FIRST ASSISTANT TO THE NUFFIELD DEPARTMENT OF MEDICINE, OXFORD

ASPIRATION of petrol into the lungs seems to be an uncommon accident and reports of its effects are rare, but war-time petrol restrictions have increased the temptation to siphon it from one container to another and sucking at tubes to establish such siphons has led to aspiration of the liquid A fatal accident apparently from this cause occurred recently in Winchester and was reported in the daily press In the following case the patient recovered

CASE-HISTORY

A healthy man of 28, employed as a lorry driver, was trying to remove sediment from the petrol tank of a tractor and was sucking at a tube of about 1¼ in bore in order to establish a siphon by which to run off the petrol He felt some petrol enter his mouth, the quantity was later estimated to be ¼ pint A part was swallowed but some was felt to "go the wrong way" He tried to cough it out, but in a few seconds became very short of breath He beckoned to a friend to slap him on the back and remembers this being done He felt as though "bursting for breath" and lost consciousness, becoming deeply cyanosed On recovering consciousness a few minutes later he felt light headed, sick and weak but could breathe more easily Deep inspiration caused slight pain in the lower right chest He was given an emetic which caused vomiting and after about five minutes was able to walk unaided about 50 yards to a shed where he lay down He now felt much better and had little nausea, but gas eructated from the stomach smelt of petrol He was put to bed and given a further emetic Two hours later the pain in his right chest had increased greatly and his cough was worse After coughing he could taste and smell petrol in his mouth He vomited several times during the next 24 hours, the vomit still tasting and smelling of petrol There was no epigastric pain or diarrhœa Pain in the chest continued and was made worse by coughing A dark brownish sputum began to appear He was admitted to the Radcliffe Infirmary on the third day

His general condition was fairly good but he had slight cyanosis and moderate dyspnœa Temperature 100 8° F, pulse rate 100 per min with good volume, respiration rate 36 No odour of petrol in the breath, tongue coated Diminished movement of the right chest and mediastinum displaced to left, apex beat being 1 in external to nipple line Breath sounds poor at right base where there were signs of a pleural effusion of moderate size Ægophony and tubular breathing heard above angle of right scapula, no pleural friction or adventitious sounds heard at any time Left lung showed no abnormal signs Small amount of sticky mucoid sputum which was moderately bloodstained and contained many pneumococci Heart normal, blood-pressure 106/78 mm Hg Blood count showed leucocytosis of 12,000 but no other abnormality No abnormality in abdomen or nervous system Clear yellow fluid, 15 oz, removed from right pleural cavity This fluid did not smell of petrol, it contained only an occasional pus cell and both aerobic and anaerobic cultures were sterile Sulphapyridine given as a precautionary measure for 7 days had little effect on the temperature, which fell gradually to normal in 10 days Further smaller quantity of fluid was aspirated 3 days after first aspiration; character unchanged After few days in hospital chest pain disappeared and patient felt well X ray of chest on admission showed opacity due to pleural effusion but above this there was a suggestion of coarse mottling in the lung, possibly due to small patches of consolidation, mottling disappeared in a few days though absorption of remaining fluid was slow A month after admission movement of right chest was still much impaired in spite of breathing exercises Right base was still dull to percussion with almost absent breath sounds, but vocal fremitus was now increased Opacity was still present in the radiogram, suggesting a small amount of persistent fluid but none could be obtained on attempted aspiration Patient was sent home to convalesce

A week later the lung signs were only slightly improved Chest expansion was only ½ in on the right side compared with 1½ in on the left He now returned to work and 3 weeks later expansion was almost equal on the two sides and in a further week completely so Breath sounds were still much weaker on the right side and slight dullness was still present At this time, over 8 weeks after the original accident, X rays showed some persistent opacity of the right lower lung field reported to be "consistent with resolving pneumonia" He was free of all symptoms

DISCUSSION

When petrol or kerosene are swallowed in mistake for other liquids some may enter the lungs and pneumonic signs may result (Waring 1933), and many such cases are on record mainly in small children, but as a rule the pulmonary signs are not the main feature of the clinical picture, in which collapse is often severe, unconsciousness common and alimentary signs prominent All the reported cases of primary aspiration of petrol which I have found have resulted from sucking at wide tubes or petrol pipes in order to establish a flow, an ideal way of provoking such an accident

The effects of aspiration of petrol can be divided into three groups

Immediate effects, due to the presence of an irritating fluid in the bronchial tree, were well illustrated in the case here recorded, which in this respect may be regarded as typical Sometimes there is in addition a burning sensation in the mouth If much enters the lungs rapid death from asphyxia may result If much is swallowed burning pain in the œsophagus, epigastric pain, nausea, vomiting and diarrhœa may result, and collapse may be extreme with much cyanosis The severity of the alimentary symptoms varies and is not closely related to the amount swallowed

General effects, due to absorption of petrol into the blood-stream, are seen in uncomplicated form when petrol vapour is inhaled, for instance in garage-pits A transient exhilaration is felt which soon passes into drowsiness, with singing in the ears, cyanosis and unconsciousness, it is reported that inhalation of 20–40 gr. of petrol as vapour in 10 minutes will produce unconsciousness lasting 2–8 minutes (Levin 1888) On recovery of consciousness nausea, dizziness, headache and drowsiness may persist for some time It seems probable that the unconsciousness in the present case was due to asphyxia, but the subsequent lightheadedness may well have been a manifestation of mild petrol toxæmia Petrol in the blood-stream is largely excreted in the expired air and by irritating the lungs may cause bronchitis and coarse crepitations in the chest The presence of such crepitations in a person who has swallowed petrol should not therefore be regarded as evidence that petrol has been directly aspirated into the lungs Legludic and Turlais (1914) have shown that intravenous injection of small quantities of petrol in rabbits and dogs often leads to dyspnœa, cyanosis and pulmonary congestion, and sometimes even to hæmorrhagic and other pleural effusions It is unlikely, however, that when petrol is aspirated into the lungs symptoms referable to petrol in the blood-stream play more than a minor part in producing the clinical picture

Delayed effects—Information on the effects of petrol on the bronchi and lungs is scanty According to Sollmann (1936) a hæmorrhagic pneumonia may result but the source of this statement is not given Nunn and Martin (1932), who reported a large series of cases of petrol and kerosene poisoning in young children, found signs of pneumonitis in all fatal cases and noted that in cases which recovered the pulmonary signs disappeared within 48–72 hours But they apparently regarded the lung signs as evidence of aspiration, whereas, as I have pointed out, they are not necessarily so if much petrol

---

DR NICOL REFERENCES (*continued*)

Emery, E S and Monroe R T (1935) *Arch int Med* 55, 271
Farquharson, E L (1935) *Brit med J* i 144
Friedenwald J (1912) *Amer J med Sci* 144, 157
Hurst, A F (1920) *Brit med J* i 559
— and Stewart M J (1929) Gastric and Duodenal Ulcer, London
Lenhartz H (1904) *Deut med Wschr* 30, 412
Leube W A, quoted by Hurst
Meulengracht, E (1934) *Acta med scand* suppl 59, 375
Nielsen N A (1923) *Ibid* 58 1
Nicol B M (1939) *Lancet*, ii, 881
Russell J W (1904) *Ibid*, i 288
Sippy B W (1915) *J Amer med Ass* 64, 1625
Smith W L (1941) *Brit med J* ii 13
Tidy, H L (1936) *Ibid*, i, 1143

has entered the blood-stream The rapid disappearance of the pulmonary signs in Nunn and Martin's series suggests that they arose from excretion of petrol by the lungs rather than from its aspiration Injection of kerosene—which apparently behaves like petrol—into the trachea of a dog produces death in a few hours with œdema of the lungs and a hæmorrhagic pneumonia, the alveoli being filled with exudate containing many lymphocytes (Waring 1933) It is clear therefore that the lungs suffer a severe insult when kerosene enters them and the same is undoubtedly true of petrol The signs in our case were consistent with an acute hæmorrhagic pneumonitis similar to that found in Waring's dogs, though the rapid onset of pleural effusion was an added feature

We have found only 3 previous records of pleural effusion resulting from aspiration of petrol, though it has been produced experimentally in animals given intravenous petrol (Legludic and Turlais 1914)

In 1922, St Leger reported the case of a man of 34 who aspirated petrol into his lungs while sucking at a petrol pipe Acute pain was felt in the hypochondrium, but he developed no cough or cyanosis at first, 6 hours later he had cough with blood stained sputum and this was followed by a pleural effusion which persisted for 14 days but did not require tapping

In 1933, Schneider published details of a boy of 17 who inhaled petrol into his lungs in the same manner Severe respiratory distress and cyanosis with pain on the right side resulted, signs of a right effusion developed, the temperature rose to 101 5° F There were albuminuria and a leucocytosis of 14,000, but the boy had fully recovered a month after the accident

Another case was recorded by Johnstone in 1938 The patient was a man of 31 and aspiration was again the result of sucking at a wide bore (1¼ in) pipe to establish a siphon Burning in the throat, dyspnœa and severe pain in the right chest were early features with ashen cyanosis, temperature rose to 102 4° F Scattered râles were present in both lungs but signs of a right effusion soon appeared The fluid had no odour of petrol and cleared up completely in about 8 days X rays of the chest, as reproduced, did not suggest the presence of an underlying pneumonia

But petrol aspiration does not necessarily result in pleural effusion, there was none in an instructive case reported by Battley (1930)

A boy of 8 years inhaled petrol into his lungs when sucking at a tube The quantity was probably large Immediate severe collapse with cyanosis occurred Widespread râles were heard in the lungs with bronchial breathing at both bases Wandering pneumonic signs persisted for nearly 2 months, after which he seemed well in spite of fine râles being still audible at the right base In the early stages there was a moderate fever with a leucocytosis of 20,000, lung puncture was sterile A taste of petrol persisted in the mouth for 4 weeks

Brief mention of two cases in children aged 6 and 10 years is made by Williams (1927), in one there were dyspnœa and tachycardia, in the other severe pain in the chest but apparently no pneumonia No further details were given

These 6 additional cases are all I have been able to find in the published work, but the rarity of case-reports probably gives a false impression of the frequency of this kind of accident, since most cases probably remain unreported From this brief series it may be concluded that if the aspiration is not immediately fatal either a patchy pneumonia or a pleural effusion may develop As with other foreign matter in the lung, the right side is more often affected than the left The pneumonia may be expected to clear up gradually within a few weeks, the pleural effusion will usually remain sterile and be reabsorbed in less than 4 weeks, though residual signs may persist longer Probably no permanent disability results, but no information seems to be available about the more remote effects of the accident It is possible, for instance, that in some circumstances chronic fibrosis or even bronchiectasis might gradually develop, though no cases have been reported

Treatment must be general and symptomatic Washing out the stomach is probably preferable to the use of emetics, because of the risk of further aspiration of stomach contents during vomiting Oxygen may be required if cyanosis is severe Sulphapyridine has apparently no influence on the course of the lung lesion but seems reasonable therapy as a deterrent to secondary infections Breathing exercises are desirable after the acute symptoms have passed, to encourage re-expansion of the lung Tapping of the pleural effusion is not usually necessary but a sample of the fluid should be removed for examination, and advantage should be taken of this opportunity to withdraw as much fluid as possible The tendency to further accumulation seems to be small

Since these notes were compiled a full review of all aspects of petrol poisoning by both liquid and vapour has been published by Machle (1941) His careful survey of published work throws no further light on the effects of petrol aspiration into the lungs

SUMMARY

A case of aspiration of petrol into the lungs by a man of 28 is reported He lost consciousness for a few moments at the time and afterwards developed a right pleural effusion with patches of pulmonary consolidation He recovered

Published cases are reviewed These show the immediate effects of petrol aspiration to be signs of irritating fluid in the bronchial tree (cough, cyanosis, asphyxia) or stomach (pain, vomiting, diarrhœa), collapse may be severe, or the patient may die from asphyxia General effects are transient exhilaration, drowsiness, cyanosis, unconsciousness, and on recovery nausea, dizziness and headache Delayed effects reported are wandering pneumonia, hæmorrhagic pneumonia, pneumonitis and pleural effusion

REFERENCES

Battley, J C S (1930) *J Amer med Ass* **94**, 1570
Johnstone R T (1938) *Industr Med* **7**, 243
Legludic, H and Turlais, C (1914) *Ann Hyg publ, Paris* 21, 380
Levin L (1888) *Arch path Anat* **112** 35
Machle W (1941) *J Amer med Ass* **117**, 1965
Nunn, J A and Martin, F M (1932) *Ibid*, **103**, 472
St Leger, A W (1922) *Med J Aust* **1** 300
Schneider, H (1933) *Med Klin* **29**, 1168
Sollmann T (1936) Manual of Pharmacology London p 133
Waring, J I (1933) *Amer J med Sci* **185** 325
Williams, W P (1927) *J Amer med Ass* 89, 1169

STAPHYLOCOCCAL SEPTICÆMIA

TWO CASES TREATED WITH SULPHATHIAZOLE

W S Flowers, M B LEEDS
MEDICAL SUPERINTENDENT

D H Collins, M D LPOOL
PATHOLOGIST

K H Hardy, M B SHEFF
RESIDENT MEDICAL OFFICER

OF AN EMS HOSPITAL

Staphylococcal septicæmia has a high mortality A few cases may be saved by prompt surgical elimination of the focus of infection before metastases or the septicæmia overwhelm the patient Every surgeon is aware, however, of how rarely this can be achieved and he has also seen the chronic osteomyelitis case fail to master his infection despite repeated operations There was no reliable drug the surgeon could call to his aid until the advent of the sulphonamides Sulphathiazole is the best drug at present available for the treatment of staphylococcal infections, but the results here have never been as satisfactory as those achieved in the treatment of other coccal infections by this and other sulphonamides Butler (1940), for example, writes " sulphathiazole seems to have little or no beneficial effect on staphylococcal infections where there is a positive blood-culture," but a few successes in staphylococcal septicæmia have been reported by McCrea (1940, 2 cases), by Melton (1941, 5 out of 13 cases) and by Heselson (1941, 1 case) Melton and Heselson used continuous intravenous administration of sodium sulphathiazole solution to maintain a high blood concentration of the drug in addition to oral doses and Melton also gave staphylococcal antitoxin in 4 of the successful cases Soluble sulphathiazole was not available to us when treating our cases and we had to rely on large and continued oral dosage The 2 cases reported here were in military patients

Surgeons are often over-cautious in their use of drugs, but toxic reactions should be risked freely in dealing with so grave a condition as staphylococcal septicæmia One of our purposes in reporting these cases is to show that the administration of sulphathiazole can be continued far beyond the limits usually regarded as constituting a fair therapeutic trial, and that the chance of success may be lost by setting an arbitrary limit to the dosage

CASE-HISTORIES

CASE 1 —Man of 36 Crop of boils appeared on both forearms early in March, 1941, 3 weeks later complained of right sciatic pain X ray showed only little mottling of ilium Attended as outpatient for physiotherapy, but a week later developed increased pain and pyrexia March 30 admitted Temp 103° F, pulse rate 90, resp 32 Acute tenderness in right loin No abnormal signs in chest or abdomen. History of earlier attacks of lumbago, pain thought to be rheumatic Aspirin failed to control pyrexia Urine febrile albuminuria and casts April 3, dyspnœa, cyanosis, cough and sputum, signs of bilateral bronchopneumonia confirmed by X ray Sulphapyridine, 1 g, intravenously followed by 1 g 4-hourly by mouth (see table) Vomited after 12 g, further 12 g given in intramuscular injections 4-hourly April 8, still very ill with physical signs of bronchopneumonia, blood-culture grew *Staph aureus* in saponin broth agar medium (Penfold et al 1940) By April 10, 36 g of sulphapyridine had failed to influence pyrexia, and drug was stopped. Swelling in right loin needled, sterile serous fluid withdrawn

April 11, sulphathiazole begun, 2 g, followed by 1 g 4-hourly by mouth. April 13, pus aspirated from swelling over right external malleolus, *Staph aureus* grown, coagulase positive New boil on back, abscesses beginning to form at sites of previous intramuscular injections of sulphapyridine in both upper arms X ray showed no bone disease Exploratory arthrotomy of ankle, no pus found By April 17 was taking 18 g of sulphathiazole daily by mouth Chest signs unchanged, patient gravely ill Dyspnœa treated by oxygen through B.L.B mask. Lung disease thought to be part of staphylococcal pyæmia, but organisms never actually recovered from sputum April 21, urine loaded with crystals (170 mg of sulphathiazole per 100 c.cm), no albuminuria Discharging sinus leading from external malleolus dressed with sulphathiazole powder April 24, morbilliform rash on back of neck, and bilateral conjunctivitis Next day patient exhausted and disoriented Rash had extended Temperature 104 6° F In past 14 days total of 217 g of sulphathiazole had been given Temperature fell immediately on withdrawal of drug and was normal next day, then began to swing again reaching 99°–101° F in the evenings for next 4 weeks, while infection was becoming localised in right fibula. Arm abscesses healed slowly and lungs cleared Secondary anæmia treated by two transfusions of fresh blood (1 pint) and iron by mouth.

May 24, operation saucerisation of lower end of right fibula for osteomyelitis, revealed by X ray Wound packed with 'Vaseline' gauze, and closed plaster applied. Sulphathiazole, 5 g, given by mouth day before operation, on day of operation itself and on day after, to prevent blood-borne metastasis of infection Skin rash recurred and there was pyrexial reaction, temperature reaching 104 6° F, but falling promptly on withdrawal of drug Patient again slightly delirious Blood concentration, 4 mg of sulphathiazole per 100 c cm Pure culture of *Staph aureus* (coagulase positive) obtained from fibula

June 20, plaster renewed with walking iron, wound healing well. July 2, pain in right loin. X ray showed rarefaction of upper part of ilium, resembling inflammatory disease, more definite than appearance in X ray of this part taken in March. July 7, swelling appeared over crest of ilium but exploring needle found no fluid, after 3 weeks rest in bed pain subsided and nothing further developed Aug 15, plaster removed. Wound almost healed, dressed daily with sulphanilamide powder Thirteen days later, blotchy red rash appeared on trunk and arms and around wound, but faded within 2 days of stopping sulphonamide dressing. Discharged recovered in November, 1941

CASE 2 —Man of 34 Many boils in adolescence In April, 1941, carbuncle developed on back of right thigh Fever, but improvement after 5 g of sulphapyridine and evacuation of pus from carbuncle About 10 days later pain in right upper arm and fever Arm poulticed, given small doses of sulphapyridine (2 g daily) while at home on sick leave May 16, admitted to hospital with temp 100 2° F, pulse-rate 112 Acute inflammation around right shoulder and upper arm Scar of the original carbuncle dry and skin almost healed. Apart from tachycardia, no apparent visceral disease Urine normal Looked and felt gravely ill Septicæmia, with localisation of pus among muscles of right upper arm, diagnosed Blood-culture coagulase positive *Staph aureus* Anæmia, white cells 6200 Absence of leucocytosis attributed to sulphapyridine given before admission and still present in the blood in a concentration of 0 5 mg per 100 c cm Sulphathiazole started immediately, 4 g by mouth followed by 1 g every 2 hours May 17, X ray of right arm and shoulder showed no bony change May 19, better Fluid intake had been restricted in mistaken attempt to raise blood concentration of sulphathiazole,[1] but heavy deposit of drug appeared in urine on standing, with some albumin, fluids then allowed freely May 20, drowsy and disoriented. Blood-urea normal. Abscess in arm fluctuant

AXILLARY TEMPERATURE, TOTAL DOSAGE AND BLOOD CONCENTRATION OF SULPHONAMIDE, AND BLOOD-PICTURE

CASE 1

Date	Max. temp (° F)	Sulphonamide		In blood (mg per 100 c.cm.)		Hb %	White cells	Polymorphs %
			Total to date (g)	Free	Total			
April 1	101 2					102	11 000	86
8	101 6	Sulpha-pyridine	24	3 5	5			
9	102 4		30	3	5			
10	103		36			90	20,700	92
11	102 8							
12	103 2	Sulpha thiazole	9	2	2 5			
15	99 8		44	2	2 5			
16	102		60	5			17,000	86
19	101 8		96	8	9 5	65	14,500	86
21	101 8		132	6 3	7		17,300	87
25	104 6		217					
28	99 6						11,500	85
May 23	100 2							
24	103	Sulpha-thiazole	10	4				
25	104		15					
26	98 6					70	10 500	85
June 2	98 4					68	9200	65
Sept. 9	98 4					90	8800	71

CASE 2

Date	Max. temp (° F)	Sulphonamide	Total to date (g)	Free	Total	Hb %	White cells	Polymorphs %
May 16	102	Sulpha-pyridine *		0 5		85	6200	79
17	101 4	Sulpha-thiazole	14	2 5			9900	80
19	99 8		33	3 8	4 2		12 800	78
21	101		54	2 8	3 5			
22	100		65	2 8		67	9900	83
26	100 4		111	4			16 500	77
29	102 8						14,000	70
30	99 2	Sulpha-thiazole	12	5				
June 1	100		32					
7	100 2					72	20 000	81
11	99 4	Sulpha-thiazole	6	4	5			
13	102		26					
20	99 6					62	14 000	66
Nov 18	98					81	9400	78

* 12 in 6 preceding days

May 21, operation incision of abscess with drainage under 'Evipan' anæsthesia Pure culture of *Staph aureus* grown from pus General improvement for several days but temperature still swung to 100° F. or 101° F. on most evenings Drug fever suspected and sulphathiazole discontinued on May 26 after 111 g had been given. Evening temperatures, however, increased to 102 8° F Sulphathiazole started again on May 30, after further 32 g had been taken maculopapular rash appeared on both legs, back of neck and around eyes, mild conjunctivitis of left eye Sulphathiazole stopped. Swinging temperature persisted, signs of localisation of infection in right humerus, confirmed by X ray on June 9 Second blood-culture on this day sterile

June 11, operation saucerisation of upper half of shaft of right humerus, vaseline gauze pack, plaster spica Pint of plasma transfused at end of operation. Sulphathiazole, 6 g, given by mouth in 4 hours preceding operation raised blood concentration to 4 mg per 100 c cm. Further 20 g given during next 48 hours evoking toxic reactions—mild delirium, rapid pulse, slight cyanosis and severe conjunctivitis of left eye General state resembled delayed shock. Sulphathiazole stopped and rectal salines given Next day temperature fell and patient improved rapidly

---

[1] Alyea and his colleagues (1939) have shown that blood concentration of a sulphonamide does not vary with fluid intake Functional impairment of kidneys raises blood concentration of drug but in patients with normal renal function forced or restricted fluid intake affects only concentration and not total excretion of drug in urine

Some fever continued until June 24 when wound dressed with sulphanilamide and new plaster applied Became a case of chronic osteomyelitis, was walking about for much of this time, gradually improving By October, 1941, new small focus of bone infection had formed in subperiosteal area of lower part of shaft of same bone

On Oct 23 new openings made into marrow cavity of humerus and many sequestra, some of considerable size, removed Within 10 days he was on his feet again and has had no pyrexia since General state is excellent and local condition shows promise of recovery

DISCUSSION

The early part of the illness in these two patients followed a familiar course Both were gravely ill with positive blood-cultures and the clinical signs of septicæmia The infection eventually became localised in a bone in each case The bronchopneumonia in case 1 was probably staphylococcal It did not resolve under the influence of sulphapyridine, and staphylococci were recovered from the blood after 24 g had been taken Pyæmic abscesses formed in the muscles of both upper arms at injection sites and new boils developed on the skin All these resolved and the blood became sterile and the final locus of infection became an osteomyelitis of the fibula, a situation accessible to surgery The 217 g of sulphathiazole administered to this patient produced unpleasant toxic reactions but undoubtedly saved him from death in the pyæmic phase and paved the road to eventual recovery In case 2, the septicæmia continued for about a week before a local collection of pus formed The radiological evidence indicates that no serious infection of the humerus was present before sulphathiazole was given Though the bone infection was not prevented, the blood was sterilised and further metastasis of the infection was avoided Pyrexia continued after the blood had become sterile but the improvement in the patient's general condition distinguished this later phase of the disease from the early septicæmic stage Osteomyelitis was not averted in either case, which supports the view that the sulphonamides have relatively little effect on localised infections and thus offer no excuse for lessening surgical endeavour

The dosage of sulphathiazole was much larger than any previously reported A total of 232 g was given in case 1 and of 169 g in case 2, in addition case 1 had 36 g and case 2 12 g of sulphapyridine before sulphathiazole was begun Sulphathiazole was given entirely by mouth in the form of crushed 0 5 g tablets of 'Thiazamide' (M&B 760) Small amounts of bicarbonate of soda were given with each dose The maximal daily dose was 18 g (three tablets 2-hourly) which was given on 9 consecutive days to case 1 The commonest daily dose in case 2 was 12 g (two tablets 2-hourly) During the first continuous course case 1 received 217 g in 17 days, and case 2 received 111 g in 10 days followed by 32 g in 3 days after a 3-day intermission In both patients a further short course of the drug (25 g in case 1, 26 g in case 2) was given over the time of operation, to prevent dissemination of the infection

Blood concentration of free sulphathiazole did not exceed 8 mg per 100 c cm in case 1 or 5 mg per 100 c cm in case 2 These concentrations are much below the 15 mg per 100 c cm which Melton (1941) considered should be attained Sulphathiazole is more rapidly eliminated than either sulphapyridine or sulphanilamide and it seems difficult to maintain high concentrations by mouth The lower concentrations, however, coupled with the long period of administration appeared to be effective The blood concentration of conjugated sulphathiazole was always low and less than we have generally found in patients treated with sulphapyridine

Urinary concentration of sulphathiazole was very high, reaching 170 mg per 100 c cm in case 1 and 500 mg per 100 c cm in case 2 The latter figure is above the experimentally determined solubility of the drug at body heat and pH 7 6 (Climenko and Barlow 1941), but Heyl (1941) has also recorded a comparable figure There was slight albuminuria but neither blood nor casts and no permanent renal damage resulted Fluid intake should be pressed to the limit of comfort with all patients taking large doses of sulphonamides, this does not reduce the blood concentration of the drug but it does diminish the risk of kidney damage by crystals precipitated from supersaturated urine The blood-urea was not raised in case 2 towards the end of the first course of the drug

Toxic reactions differed from those we have encountered in sulphapyridine therapy The huge doses which were tolerated show that sulphathiazole is the least toxic sulphonamide at present in common use Cyanosis was mild and caused no alarm Vomiting was slight and only interfered once with the continued oral administration of the drug Polymorph leucocytosis was well maintained (see table) and anæmia could not be dissociated from the effects of the infection alone Mild delirium was prominent in both our patients, and seemed to be due to the drug It disappeared rapidly when the drug was withheld and reappeared when it was given again Sulphathiazole certainly added to the patient's malaise and we agree with Heyl's (1941) remark that "most patients are very grateful to be off the drug" Drug fever occurred, the evening temperature reaching great heights towards the end of the first course in case 1 and subsiding as soon as it was stopped, high fever was again induced by the second course Toxic dermatoses developed in both patients These were a morbilliform rash in the first case and a maculopapular rash in the second Conjunctivitis also occurred in both patients The rapidity with which these toxic reactions reappeared in the second courses of sulphathiazole—begun 28 and 10 days after the end of the first course—suggests that the patients had become hypersensitive In case 1 even small local applications of sulphanilamide to the wound caused reappearance of the toxic rash three months after the last oral dose of sulphathiazole We do not know how far this sensitivity might militate against future sulphonamide therapy It seems important to determine the time of administration and the dosage which induce this hypersensitiveness, and the incidence of susceptibility

The importance of combining the fullest surgical endeavour with sulphathiazole treatment cannot be too highly stressed The drug alone failed to curb the development of osteomyelitis It saves life in septicæmia and pyæmia where operative surgery is powerless, but is itself powerless to resolve localised infections We twice used the drug as a prophylactic against dissemination of infection at operation, and recommend the measure in debilitated subjects despite the risk of unpleasant toxic reactions Sulphathiazole, 6 g in the 6 hours preceding operation, raised the blood concentration to 4 mg per 100 c cm at the time of operation Heyl (1941) is doubtful of its prophylactic effectiveness but he aimed at obtaining a blood concentration of only 2 mg per 100 c cm

Early treatment of septicæmia by adequate doses of sulphathiazole is clearly important Success must depend partly on there being only a light infection of the blood In our cases cultures yielded about 10 colonies of staphylococcus per 1 c cm of blood We agree with Butler (1940) that a patient whose blood-culture runs into hundreds of colonies per c cm is as a rule past therapeutic aid

Continued treatment is equally important Success is probably achieved not so much by the abrupt sterilisation of the blood as by the bacteriostatic activity of sulphathiazole, which maintains the numbers of circulating micro-organisms within such small limits that they can be eventually disposed of by the natural body defences We urge, therefore, that no arbitrary limit be set to the amount of the drug or the time over which it should be given before it is deemed to have failed As our cases show, very large total doses of sulphathiazole can be tolerated Treatment should only be interrupted if one of the following events occurs pronounced clinical improvement, repeatedly sterile blood-culture, dangerous toxic reactions Whether the toxicity of the drug or of the infection is more dangerous to life is a matter for individual judgment

SUMMARY

Two cases of *Staphylococcus aureus* septicæmia have been successfully treated with sulphathiazole

Massive oral doses were given, the total dosage amounting to 232 g in one case and 169 g in the other

Blood concentrations of the drug were relatively low (up to 8 mg per 100 c cm in one case, 5 mg per 100 c cm in the other) but appeared effective

Increased malaise, mild delirium, fever, dermatoses and conjunctivitis were the toxic reactions encountered Both patients developed hypersensitivity to the drug

The need for early and adequately continued administration of sulphathiazole and for full surgical treatment is illustrated

We wish to acknowledge the help we have received from Prof E J Wayne in dealing with these cases

REFERENCES

Alyea E P, Daniel W E and Yates A (1939) *J Urol* 41, 1
Butler, E C B (1940) *Proc R Soc. Med* 33 677
Chmenko D R. and Barlow, O W (1941) *Lancet*, i, 770
Heselson J (1941) *Ibid*, i, 311
Heyl J T (1941) *Proc. R Soc Med* 34, 782
McCrea, H M (1940) *Ibid* 33 679
Melton G (1941) *Lancet* i, 274
Penfold, J B, Goldman J and Fairbrother, R W (1940) *Ibid*, i 65

SALT CONCENTRATION IN BLOOD-GROUPING TECHNIQUE

HANS SACHS, M D LEIPZIG
LATELY PROFESSOR OF SEROLOGY AND IMMUNOLOGY IN THE UNIVERSITY OF HEIDELBERG
(From the Department of Bacteriology, Trinity College, Dublin)

UNHEATED sera when undiluted or slightly diluted may fail to cause hæmagglutination, while sera heated at 55° C in the same circumstances display full agglutinating power Attention has been called to the inhibition of isoagglutination occurring in undiluted or slightly diluted serum by Holzer,[1] Pondman and Brandwijk[2] and Andersen[3] Holzer as well as Pondman and Brandwijk have compared this peculiarity to the prozone phenomena in bacterial agglutination but Andersen stressed the fact that the inhibition of isoagglutination in undiluted serum is not caused by excess of agglutinins He showed that the inhibition is lessened or disappears as a result of those influences which diminish the complement activity—for example, heating or storing the serum Nevertheless, he pointed out that agglutination may be inhibited when unheated and stored serum is used, although no visible hæmolysis is detectable

Complement activity is only one of the peculiar qualities of the globulins present in fresh serum It is well known that flocculation which corresponds in principle to the phenomenon of agglutination may also be inhibited or prevented by the presence of unheated serum, for example, sera must be heated to 55° C in doing most of the serological tests for syphilis because otherwise they are liable to give false negative results In these the heating alters the labile serum proteins which, in unheated serum, inhibit antibody reactions They become stabilised by heating, and this removes their inhibiting action However, flocculation tests may be performed with unheated serum if the salt concentration is increased higher salt concentration prevents the labile globulins from reacting and thus allows flocculation to take place

This led me to consider whether it might be practicable to perform blood-grouping tests with fresh unheated serum or plasma in the presence of a higher salt concentration than normal Of course the errors (false negative results) resulting from using fresh unheated serum for typing the blood-groups may easily be avoided if sera used for routine typing of the cells are heated at 55° C or stored for a sufficient time On the other hand speed may be desirable and it may be inconvenient to heat the serum or plasma These considerations will apply especially when examination of the serum is combined—as it always should be—with examination of the blood-cells No technical mistakes in blood-grouping are possible when this combined procedure is used But the peculiarities of unheated serum or plasma may interfere with cross-matching before transfusion because, although the corpuscles of the donor contain agglutinogens and the recipient's serum contains the corresponding antibodies, agglutination sometimes fails to occur

Preliminary experiments showed that sodium-chloride solutions of higher concentration produced the results expected When typing of the blood-groups was performed on slides (by mixing a drop of fresh serum or plasma with a drop of a roughly 5% suspension of blood-cells) a big difference could be observed on adding a drop of a 3–5% solution of sodium chloride instead of the usual 0 9% Either agglutination occurred only when the more concentrated salt solution was added, or the speed and strength of agglutination were distinctly increased The agglutinated particles were strikingly coarse in comparison with those of the controls containing only 0 9% saline

The increased salt concentration intensifies both the speed and strength of agglutination Since the result depends on both actions, it was necessary to determine the optimum concentration of sodium chloride For agglutination tests it seemed convenient to make up the suspensions of corpuscles in salt solution of appropriate strength For the examination of unheated serum it was found best to suspend the cells in 3% sodium chloride, the cells having a conceptration of about 5% for typing on slides and about 1–1 5% for typing in tubes When equal amounts of serum or serum dilutions and cells were mixed the difference in comparison with suspensions of cells in 0 9% saline was usually quite distinct, as evidenced by the speed of agglutination and the much coarser particles When unheated serum tends to cause some hæmolysis, this is prevented and agglutination is quickly visible Even if the serum lacks hæmolytic action or has lost it on storing, the difference is considerable Suspending the corpuscles in stronger sodium-chloride solutions is clearly a safe way of avoiding false negative results such as may particularly occur on cross-matching

The increased salt concentration, however, is itself capable of inhibiting agglutination, as may be seen on titrating the sera at higher dilutions Although the speed and strength of agglutination are at first much increased with high salt concentrations, the end titre may be lower (see table) For this test an unheated serum was used which had no hæmolytic action after 7 days in the refrigerator

EFFECT OF SALT CONCENTRATION ON AGGLUTINATING ACTION OF UNHEATED SERUM (GROUP O) ON B RED CELLS

Serum dilution	Action at room temperature on red cells suspended in—					
	0 9% NaCl			3% NaCl		
	At 2 min	At 15 min	At 1 hr	At 2 min	At 15 min	At 1 hr
Undiluted	–	+	+	+++	++++	++++
1 2	–	+	+++	+++	++++	++++
1 4	±	++	+++	++	++++	++++
1 8	–	++	+++	+	++++	++++
1 16	–	+(+)	+++	–	+++	+++
1 32	–	+	+++	–	+	++
1 64	–	±	++	–	–	+
0	–	–	–	–	–	–

Tests performed in tubes by mixing equal parts of about 1% suspension of red cells and serum dilutions in 0 9% saline

The differences are more pronounced in the incubator than at room temperature or in the refrigerator, although they are evident enough at the temperature of the room in which typing is usually performed

Another question to be answered is whether the same procedure would be suitable for routine typing when either heated or stored sera are used And it may also be asked, as Dr R A Q O'Meara has pointed out, whether the higher salt concentration produces its effect only by electrolytic action or whether the increase in the osmotic pressure on the cells also plays a part Experiments showed that agglutination with heated serum may also be hastened and intensified by suspending the blood-cells in sodium-chloride solutions of higher concentration, but that a 3% solution sometimes inhibited agglutination A 2% solution produced the best results, agglutination never being less pronounced than in a 0 9% solution and nearly always being intensified Mixing equal amounts of serum or serum dilutions in 0 9% and of blood-cell suspensions in 2% sodium-chloride solutions may therefore be recommended as a suitable method for determining the blood-groups Moreover the resulting salt concentration is usually sufficient, when unheated serum is used, to prevent hæmolysis, though it is possible to make even surer that hæmolysis will be avoided by suspending the cells in 3% sodium-chloride solution

---

[1] Holzer F J *Klin Wschr* 1932 11, 243
[2] Pondman A and Brandwijk A C *Lancet* 1932, ii, 97
[3] Andersen T *Klin Wschr* 1936, 15, 152

The agglutination may not, of course, always be intensified when heated serum is used though it usually is. In my experience isoagglutination always occurs except with a few exceptionally weak samples of A cells (apparently those belonging to sub-group A_3 or even weaker types), with these the correct result can only be obtained by examining the serum. The higher salt concentration seems to prevent pseudoagglutination (formation rouleaux).

SUMMARY

Hæmagglutination (isoagglutination) with unheated serum or plasma is hastened and intensified in a high salt concentration. The cells for blood-grouping should therefore be suspended in 2–3% sodium-chloride solutions. A 2% solution is also suitable for use with heated sera, usually intensifying the speed and strength of agglutination. When unheated sera are used, a 3% solution is more effective although a 2% solution is generally successful. This procedure makes it possible to avoid the false negative reactions, caused by inhibition of agglutination or hæmolysis, which may occur in the examination of unheated sera in blood-grouping, particularly in cross-matching tests.

I wish to thank the Medical Research Council of Ireland for the grant which has enabled me to carry out this work, and Prof J W Bigger and Dr O'Meara for the facilities they have given me in the Department of Bacteriology, Trinity College.

PREVENTION OF HAMMER-TOE BURSITIS

KENNETH MCFADYEAN, M R C S

SPEAKING of foot problem in Service cases, Wood[1] said "When an arthrodesis for hammer toe is done the man should be hospitalised and the toe splinted for no less than six weeks. I have seen several who were not, with disastrous results to the arthrodesis." Perhaps it is commendable in those with hammer toe that they suffer severely and repeatedly rather than accept a radical cure at the cost of six weeks idleness. Certainly they can find little solace in academic discussions on the evolution of the foot, and I therefore suggest the following simple measures of material relief which I have applied with complete satisfaction for over 20 years.

Most of the pain arises from attacks of acute bursitis in the small bursa which early develops over the head of the first phalanx. These attacks are almost always due to the friction of a new well-fitting shoe or of an old shoe which has become loose and a little out of shape. Anyone with a hammer toe should obtain a well-fitting shoe of standard type and a stock wooden tree, accurately fitting the selected shoe. Usually this can be found without going to the expense of having a tree made. Every other shoe of whatever weight, colour or style should be ordered from the same shop and made on the same last. Once the painful process of getting this new shoe to fit the hammer toe is over it need never be repeated. When the shoe is worn out, but before it has badly lost its shape, its tree should be inserted. A small nail should be driven through the centre of the convexity produced by the hammer toe on the upper of the shoe, to mark the tree. The tree should then be withdrawn and a small metal 'Dome of Silence,' accurately centred, should be hammered into the tree. Every new shoe should be stretched by this tree, first by itself and then for a further period with a thin sock and later with two thin socks covering the tree. Shoes must be bought three months before they are to be worn. After this treatment a new shoe can be worn the whole day without discomfort, except for foot tiredness due to the inflexibility of the new sole.

When this shoe gets old, stretched or a little out of shape, friction of the bursa will again arise. As soon as it does the base of the second phalanx should be covered transversely by three superimposed strips of elastic plaster, the layer next the skin being just over ½ in. wide, the second and third layers being progressively a little narrower. The elastic plaster should cover the extensor surface and sides of the toe. It need be renewed only once a week in spite of daily bathing. The only alternative to this treatment when a shoe is much worn is to discard the shoe completely.

---

[1] Wood, H L C *Proc roy Soc Med* 1942, 35, 193.

Medical Societies

ROYAL SOCIETY OF MEDICINE

AT a meeting of the section of Surgery on April 1, with Mr ROCK CARLING in the chair, a discussion on

First Principles of Wound Treatment

was opened by Prof R S PILCHER. The surgeon, he said, is an assistant of nature and his aim is to assist in the restoration of the function of the part in the shortest possible time. There are two obstacles to the recovery of function in a wounded part—the anatomical confusion due to the tissue loss and the presence of potential or established infection. In the present state of our knowledge, the prevention and control of infection in the traumatic wound necessitates neglect or aggravation of the injured tissue. Surgical repair and infection control are incompatible factors in wound treatment. Infection introduced before the case reaches the surgeon may be inevitable, that introduced afterwards is a reproach to the surgeon, and the skin and respiratory tract of the surgeon and his assistants are a most potent source of secondary infection. The Devenish and Miles report and the MRC memo (No 6) have given ample evidence of this. The use of impermeable masks, particular care of the rubber gloves, and avoidance of direct wound handling are important controls. The surgeon who has operated with punctured rubber gloves for years with impunity may suddenly, if his skin becomes a carrier of pathogenic organisms, be faced with an outbreak of sepsis. Moreover, the cult of asepsis must be pursued and carried beyond the operating theatre to where wounds are exposed and dressed. The main weapon against infection is still the knife, and there is no justification for departing from the principles evolved in the last war, of removing dirt or dead tissue and draining the wound if infection is feared. Three points in such a toilet require emphasis. First, the skin is a viable structure and seldom needs excising in any quantity, this is a common fault in wound treatment. Secondly, the skin is elastic and seldom suffers as much as the deep structures, to deal with the deep structures, therefore, necessitates adequate enlargement of the skin hole. Thirdly, the divided muscles retract and carry contamination with them, making a complete wound excision often impracticable. With delay in treatment, the value of excision in the control of infection rapidly decreases. Great hopes now centre on the sulphonamides and surgeons are finding that they do diminish infection—with their use it is possible to do primary suture more often, and there are definitely improved results in compound fractures. But there is urgent need for further accurate information about the chemotherapy of wounds not only in war but in civilian injuries. The use of sulphonamides does not, however, warrant any relaxation of asepsis in the handling of wounds, dressings must be well fixed and not allowed to slide and traumatise the surface. Secondary infection is the main danger in an open wound and it is therefore important to close it as soon as possible. A large skin defect, as on the thighs, can be grafted immediately, at the primary operation. Wounds clean enough for closure, but where swelling or skin loss make it impossible, should be grafted at once. In the deep wound primary suture is obviously not advisable, but as soon as the surface is clean, with the aid of chemotherapy, early skin-grafting can be successfully undertaken even on an infected surface. The successful skin-graft is the best protection against further infection and it saves time and avoids contracture. In the early postoperative period, the most important measure is rest for the wound, for as long as it takes for the skin to heal and sometimes longer. That does not imply inactivity of the whole patient. It is when wounds occur in specialised regions, such as the hand, that rest is sometimes thought to be harmful. Stiffness of injured limbs following immobilisation is imperfectly understood and œdema is probably the most important factor. The proper control of posture prevents this, and it is the most important accessory to rest in the treatment of wounds, especially of the limbs.

Mr F W HOLDSWORTH, of Sheffield, said the wounds of war are no different from those of the industrial accident—the pathology of the wound reaction [illegible] the same Within a few hours granulating tissue starts to form, dead tissue is extruded, the gap is filled and the granulation tissue then becomes organised The smooth course of this is often interrupted by infection Bacterial contamination is at first very light and Mr Holdsworth has found it difficult to cultivate any pathogenic organisms from the early wound After a lapse of 24 hours the reverse is the case and heavy contamination almost invariably exists In the depth of dead tissues organisms find their ideal medium and with the aid of body heat they flourish The defence of the body depends entirely on the blood-supply A wound which contains dead or dying material must therefore lead to heavy infection There are two ways of dealing with this infection—to remove all tissues in the wound which lacking blood-supply possess no defence, and to destroy the initial infection by antiseptic solution Excision of dead and dying tissue in the wall of the wound must be thorough and ruthless, and at the end of the operation the wound is left with a lightly infected wall with active blood-supply But there is a difference in the treatment of the early and the late wound In the late wound organisms abound in the dead tissue and a living wall of granulations is developing as a protective barrier between the slough and the living cells To excise later is to operate at a time when organisms have multiplied in abundance, and any removal of the "barrier" is therefore particularly dangerous But excess loose dead tissue must be removed From 6 to 8 hours is considered the safe period for excision—from 12 hours onwards the preservation of the barrier is of utmost importance In early or primary wounds excision must be thorough and a wide opening made to get access to the deep muscle The operation often fails because of lack of ruthlessness The principle must be extended to the whole limb if the blood-supply is gone Since dead material is the source of infection, we must not introduce other dead material Ligatures for spurting vessels, and sutures for main nerves in incised wounds, are the only exceptions Bleeding must be arrested, and a collection of blood must be regarded as dead tissue, for this, firm pressure or drainage is indicated Unless complete excision of the wound is possible there must be no primary suture, nor must this be done if the skin is under tension Pack it open Œdema-relaxing incisions may be necessary It is doubtful if primary suture should ever be done in war For late wounds complete and free drainage is essential and they must be packed lightly with soft paraffin and then immobilised Rest is the essential of after-treatment and the recent work of Barnes and Trueta has shown the rationale and the importance of this Plaster is the immobilising agent of choice although plaster itself is of no particular value Persistent rise of temperature, heat over the plaster and pain are reliable indications of anything going wrong beneath it The dangers of interference with circulation by the plaster are more apparent than real It is rational to attempt to assist nature by the use of antiseptics to destroy the infection If antiseptics are to be of use they must be used when bacteria are few The antiseptic must be able to act in the presence of proteins, its action must be sustained, it must not interfere with phagocytosis or inflict further wound damage In our present knowledge the chlorine and chloramine derivatives, acridine dyes, the sulphonamides and possibly penicillin are the only suitable ones Mr Holdsworth said he had entirely given up Dakin's solution as it certainly damages granulations Because of their affinity for gauze only 20% of the flavines ever gets into the wound Penicillin may yet be available In the sulphonamides we undoubtedly have a powerful weapon In the past year he has lightly filled wounds with up to 10 grammes of sulphathiazole In recent wounds results do not differ from those where none has been used but in the delayed or infected wound results are strikingly satisfactory Sulphonamides, however, are not an alternative to wound excision or drainage, which is still the fundamental principle of wound treatment

Mr W McAdam Eccles said that what was learned in the last 18 months of the last war still holds good Let nature do all that she possibly can, the natural tissue of the body is the best antiseptic Complete excision of devitalised tissue may not always be possible or necessary as in the through-and-through wound of the machine-gun bullet By merely enlarging the opening of the entrance and exit wounds these cases do well

Mr C H S Frankau urged the importance of debridement The flavine dyes, because they stain devitalised tissue, are useful as a clue to any dead tissue left behind by the excision The use of sulphonamides is an enormous advance but must not excuse us from full surgical treatment of the wound

Mr G T Mullally was impressed by the advice to use sulphonamides He has hesitated to use them in any amount The first results were not clear and the enthusiasm with which they were greeted was due to people who were not aware of the marvellous results obtained by excision plus drainage, with no antiseptics He emphasised the importance of opening up the wound for excising it The surgeon should not fear damage to the skin, there is little harm in a large incision but there is a great danger in leaving a wound imperfectly drained

Mr A C Perry said the deep fascia is one of the structures which must be destroyed if adequate drainage is to be obtained It may maintain considerable œdema

Dr J M Barnes thought that the "barrier" in its early stage could hardly be called granulation tissue, it is a fibrin layer It is particularly delicate, easily torn by movement, and shows the extreme importance of complete immobilisation

Mr J C Scott, of Oxford, maintained that any suturing in war wounds is probably unwise Immediate skin-grafting is very well for peace-time wounds but not for time of war War-wounds are seldom seen early and certain differences of technique should be accepted The aerial bomb splinter causes an enormous amount of destruction to the muscle under the skin, and that type of wound requires very wide excision It takes nearly 3 weeks for an impenetrable granulation-tissue barrier to organisms to form, there is therefore some danger in changing plasters early Sulphanilamide powder makes no difference in fresh wounds and he has found that sulphonamide-resistant streptococci are now beginning to appear in numbers The great value of plaster is that it both immobilises and protects the wound Provided the plaster is not soaked with fluid the bacterial flora underneath does not change He always uses dry gauze for packing the wound The blood is transmitted through to the plaster, and the gauze remains white Blood-supply is the essential for fighting the infection

Dr J Trueta said that 12 hours is not the time limit for wound excision He has excised wounds after 24 hours and even up to nearly 48 hours If properly immobilised such wounds do well, and he has not had a single death with delayed excision If not immobilised these patients die If a limb wound arrives 24 hours late there is great inflammation and it is difficult to know its limits, drainage only is advisable But if the limit of the damaged muscle can be seen the way to aid nature is to excise it where seen No war wound where muscle has been excised should be stitched up and it is important for the young surgeon to have this frequently pointed out to him In Spain they had good results even before local sulphonamides There are good results now with them but they must be regarded only as a complement to the surgical technique

Colonel J A MacFarlane, of the Canadian Army, said it is difficult to find the truth about the value of sulphonamides in wound treatment The use of some sort of sulphonamide should be a routine prophylactic, but this in no way diminishes the necessity for urgent surgery as soon as the patient arrives at a proper centre. We owe much to Trueta for having rationalised and taught the principles of wound treatment and rest by plaster fixation, Sound surgery is still the sheet anchor of all treatment

Mr S M Cohen from a series of over 300 casualties at the time of Dunkirk had learnt how gratifying are results if the principles of surgery are observed These were all late cases—over 24 hours old—and the treatment consisted in enlarging the skin wounds, dividing the fascia and removing only the tattered fragments of muscle or tendon followed by plaster immobilisation Relaxation of the constricting fascial layer is of the utmost importance No local sulphonamide was at that time employed but the convalescence and results have been most satisfactory with no loss of life or limb In the compound fracture sequestra and sinus formation are still a problem and local sulphonamide therapy would here be of much assistance

The CHAIRMAN said that all reports indicate that in the treatment of the wound there is a tendency to do too much excision of skin which is neither dead nor lacking in vitality There is also a tendency to feel that by using sulphonamides excision can be avoided That is wrong, and there can be no better way of summarising the treatment of the war wound than by the words " lay it open "

Reviews of Books

Handbook of Communicable Diseases

FRANKLIN H TOP, M D, M P H, director, division of communicable diseases and epidemiology, Herman Kiefer Hospital and Detroit Department of Health London Henry Kimpton Pp 682 37*s* 6*d*

TEXTBOOKS of infectious diseases—and the number is small—are mostly designed to cater for the limited needs of the student and the general practitioner As such they are usually concise and clinical, and restricted to the prevalent fevers of the country There is room for a more ambitious book, detailed in its treatment of individual diseases and with full discussion of epidemiological as well as clinical aspects Top's book fulfils the first desideratum by including lymphocytic meningitis, psittacosis, trichiniasis, infections of the skin, tetanus, tularæmia, tuberculosis, venereal diseases, and a number of tropical infections, as well as the more common fevers , but it omits puerperal sepsis, glandular fever, infective and spirochætal jaundice, and gastro-enteritis With such a wide field to cover, a number of the diseases have been dealt with briefly—though, from the clinical aspect, adequately But epidemiology and laboratory methods in diagnosis have often been treated too briefly Outstandingly good chapters are those on tuberculosis, leprosy, measles and poliomyelitis , pneumonia, often omitted in textbooks on fevers, is given 36 pages, and sulphonamide therapy and its toxic manifestations are ably reviewed Scabies, pediculosis and impetigo are rightly included, though the author makes no distinction between the bullous impetigo of infants and impetigo contagiosa of older children The intestinal infections, including undulant fever and trichiniasis, are given no more than 50 pages The risks of serum disease in these days of refined sera are surely exaggerated, and there is no mention of TAF as a diphtheria prophylactic It is useful to have definitions and interpretations of the terms used in epidemiology, and there are two chapters on the nursing care of the infectious case in the home and in the hospital, besides sections on the nursing of each individual infection The public health nurse as friend and counsellor to the family is obviously given an important place in America There is little mention of modern views on cross-infection in wards or of measures for its control The format, and the many illustrations, plain and coloured, are features which we in these days can but distantly admire

A Modern Approach to Health Education

Ling Physical Education Association London University of London Press Pp 37 1*s* 6*d*

THIS pamphlet, expressing the views of a committee appointed by the association under the chairmanship of Miss Helen Drummond, presents a practical scheme for health education throughout school age, and is therefore an important contribution towards post-war planning Many now feel that their children enter adult life ill equipped with the knowledge on which to build a sound pattern of living The committee insist on the link between personal hygiene and the health of the community , with this as a basis an appreciation of social conditions could be laid in school years, and this, by creating an intelligent demand for better opportunities of healthy living might have far-reaching results But the danger in applying any practical scheme for education in health, as a school subject, is that the emphasis laid on it may become too strong and too self-conscious For example is it advisable to supplement routine training in the infant school with health talks and posters ? The age-grouping is a little too young throughout the scheme , the junior school may have a keen curiosity, but it is surely more natural for a boy of eight to enjoy air a outdoor wind and weather, than to learn its composition and why he breathes it Even a girl of eleven would not easily ask how we *take care* of our digestion, though she might like to be told roughly how it works Pets and plants are encouraged, and it would probably be more natural if subjects like food, exercise and training were taught more by direct observation and where possible by handling of material until the last junior year, than by a rapid subjective approach The scheme for teaching personal hygiene to children of eleven onwards is thorough and practical, and includes the care of babies If the elementary school-child is to leave school and enter a working life at fourteen this knowledge is essential equipment, but it is hoped that one of the first post-war reforms will be the raising of the elementary school leaving age, and if that happens a good deal of physiology could be shifted to a higher age-group Possibly health education will teach us that a healthy child needs a long pre-scientific childhood

The birthright of a child on a big country or farm estate was good because there was zest in his free exploration of nature, in his imaginative enjoyment of the seasons and his friendly understanding of animals His home saw to it that he grew up sturdy, and behaved himself indoors He absorbed home training and atmosphere, he didn't analyse it When he was older he generally had the sense to see what this background had meant to him, and what shepherds, fishermen and woodcutters had told him he remembered, because they interpreted living facts in a living way In other words, we should guarantee children a healthy life, not create health consciousness Apart from inculcation, and a possible quick explanation, of good habits, the analysis of health in the junior school is our affair, not theirs In the higher classes, after establishment of puberty, the subjects of the Ling scheme would seem an essential training part of any practical education in the art of living

Law for the Medical Practitioner

D H KITCHIN, barrister at-law London Eyre and Spottiswoode Pp 376 15*s*

IN the latest addition to the series of " Practitioner Handbooks," Mr Kitchin brings within easy reach the legal information which every surgeon and physician ought to know His preliminary chapter on the law and the law courts indeed might well be taught as part of every citizen's education The other fifteen chapters deal with the medical practitioner's rights and duties, his possible responsibility to patients and third parties, his conduct if he has to enter the witness-box or to make a will or take a death-bed statement, and such varied medicolegal topics as mental disorder and deficiency, divorce and nullity, abortion and bastardy There are useful pages on the business aspects of practice He is not afraid to criticise the law he expounds, and he is among those who advocate a right of appeal to the High Court for practitioners found guilty of infamous conduct, though this reform might deprive the G M C (and therefore indirectly the medical profession) of its exclusive control of professional standards He would give the council a power to fine or to suspend a practitioner for a stated period He regrets the inability to compel the attendance of witnesses, to administer the oath and to award costs For lack of these powers he thinks the council is far too apt an instrument of private vengeance in the hands of professional rivals, vindictive ex-patients or jealous husbands As he points out, these changes need legislation Any bill which touches medical practice stirs up a mort of controversy

The book is easy to read in spite of its compression , textbook writers can hardly be expected to keep pace with the defence regulations, or to mention every minor and temporary variation , otherwise the emergency relaxation of the cremation regulations, where death is due to war operations, might have been noted No important case, ancient or modern, seems to have been overlooked Readers who, with Mr Kitchin's skilful help, inform themselves of all the traps which the law sets for the medical practitioner, will doubtless be the more ready to follow his wise advice about joining a defence society

THE LANCET

LONDON SATURDAY, APRIL 18, 1942

VITAMIN A IN VEGETABLES

IN 1937 the adult's requirement for vitamin A as assessed by a technical commission of the League f Nations at about 3000 IU a day. It was sugested that this intake could be assured by taking a int of milk, one egg, an ounce of butter and a helping f green vegetable every day. Although no attempt as made at the time to differentiate between requirements for preformed vitamin A, which is purely an nimal product, and for the vegetable pro-vitamin, arotene, these foodstuffs would contribute about 000 IU of vitamin A together with 1000 IU of caroene. The war has greatly reduced supplies of dairy roducts, which are now available in generous amounts nly for children and expectant mothers. The unrivileged adult receives no more than about 500–800 U of preformed vitamin A daily. This includes he contribution made by margarine, which is itaminised to a potency equal to about half that of ood butter. Since commercial supplies of vitamin-A concentrates are probably too low to raise much hope of increased fortification of the margarine, and since we cannot all become cod-liver oil drinkers, the deficit in the intake must be made good by a greater consumption of vegetables. At first sight all that seems necessary is to raise the daily intake of carotene from 1000 to 2500 IU. But in fact we need an answer to several outstanding problems before we can estimate accurately the amount of extra carotene which will be required. Thus the biological experiments which have enabled us to express quantities of preformed vitamin A in terms of the international unit, which is based on carotene, have all been done with rats. There is evidence that in farm animals carotene is absorbed less completely than in the rat, and possibly the same may apply to man. In others words the unit of vitamin A, which for the rat has been fixed to be exactly equal to the unit of carotene, may for other animals be worth considerably more than a unit. It is of crucial importance, therefore, to decide whether the official estimate of 3000 IU for the daily human requirement should refer to vitamin A or to carotene. Moreover, most experiments on the relative activities of vitamin A and carotene have been made with oily solutions of the two substances. Can carotene be equally well absorbed from vegetable tissues, and if not how will the efficiency of absorption vary with different vegetables? How will cooking, mastication and the individual powers of digestion affect the issue?

Attempts to answer some of these questions have already been made by many workers, who have approached them from different angles. It seems plain that in the human subject carotene is less well absorbed from the intestinal tract than vitamin A, since the fæces contain no vitamin A, but usually large amounts of carotene. Experiments in which the efficiency of absorption of carotene has been placed as low as 1% may however be criticised on the ground of faulty methods of estimation. The available evidence suggests that the average efficiency may reasonably be taken as between 30% and 50%. Possibly a further loss may occur, reducing the total efficiency to about 25% in the case of man, when the pigment is converted to vitamin A after absorption from the intestinal tract. It follows that if the official estimate of the requirement as 3000 IU was intended to refer to preformed vitamin A, it must be multiplied two to four times to be equivalently expressed in international units of carotene. If on the other hand it was intended to express the requirement in terms of carotene, the figure 3000 IU should be divided by between two and four when it is desired to express the requirement wholly in terms of preformed vitamin A.

Whatever the ultimate solution of this intricate problem, it does not affect the fact that during the remainder of the war we must rely on vegetables to supply the bulk of the national requirement of vitamin A. Under these circumstances the evaluation of the requirement in terms of preformed vitamin A becomes much less important than its assessment in terms of carotene, and particularly in terms of carotene as usually eaten in cooked vegetables. Such information seems particularly desirable in regard to the carrot, which must be reckoned as our main source of carotene on a large scale. Its gross carotene content as estimated by chemical tests, is usually about 20,000 IU per 100 g, which means that even with very inefficient absorption the carrot must be a valuable source of vitamin-A activity. Other vegetables, including spinach and broccoli tops, may be almost as rich; but they are available in smaller quantities over a shorter season, crop less heavily and cannot be stored. By the successful planning of the Ministries of Food and Agriculture adequate supplies of carrots were produced last year, and with an equal crop this season about ½ lb per week per head of the population should be available throughout the year. Even though we do not know the exact requirement, efforts should be made to encourage everyone to consume this weekly share of half a pound as a safeguard to their health. The need for this must be frankly explained to the public. It is not enough merely to say "Eat more carrots," for this slogan will arouse no response in the indifferent and in those who do not like carrots; the public must realise that since they can no longer get their pint of milk, egg and ounce of butter they must make up with carrots, helped out with vitaminised margarine. The campaign to introduce new and attractive ways of cooking carrots is a valuable step in this direction. There seems little point, however, in making particular efforts to boost the raw carrot. The carotene is not destroyed by cooking, and only small amounts of the heat-labile vitamins B_1 and C are present in the roots even when raw. There is evidence, too, that cooking increases digestibility, with a corresponding increase in the efficiency of absorption of the carotene.

COMMISSION AND OMISSION

EVEN before the outbreak of the present war the Medical Women's Federation had been in fruitless correspondence with the War Office regarding the status of medical women who might be invited to serve with the land forces. They were then told that in the event of another war no women doctors would be wanted in any capacity by the Army. But when the war came women doctors were asked to volunteer and were offered "relative rank" in the RAMC (and later in the medical branch of the RAF) with status, salary and allowances similar to those of their men colleagues This was accepted as reasonably satisfactory When, later on, the Government decided to grant commissions to other women in the forces, including nurses, it was considered that women doctors must also have commissions of some sort The obvious and natural thing would have been to give them commissions in the RAMC, for which service they had been recruited Whitehall set its face resolutely against this, ostensibly because of some vague legal difficulty, and because women should not be asked to discipline men or to fight Eventually commissions were offered to women for service *with* the RAMC and RAF (medical branch), but not *in* these services Such commissions are not equal to those held by men because they give women a status definitely lower than men of equivalent rank

The grudging attitude of the Whitehall authorities is difficult to understand Presumably women doctors are needed by the Army or they would not be asked to volunteer in considerable numbers And if they are needed it is ungenerous to offer them conditions of service which necessarily lower their professional position Many of the young medical women who have been recruited have probably accepted the conditions offered without much thought, but the fact that they are satisfied with their work is no excuse for an insistence on professional inequality based on a theoretical difficulty as to combatancy The likelihood that a medical woman might find herself suddenly called on to take command (say) of a hospital unit, because her superior officers were killed or absent, is remote, especially having regard to the relatively small number of women doctors and the kind of work they are doing, although in modern fighting no situation can be ruled out, and any day a woman may find herself in a tight corner and be called on to face dangers and assume responsibilities which were certainly not contemplated as part of her medical duties

No wonder medical women are wounded at the refusal of the authorities to recognise their claim for equal treatment The accepted principle of professional equality has been ignored and women doctors are left in an indefinite and unsatisfying position, attached to one service but actually belonging to none The fact that the younger women doctors are in future to be conscripted makes it irrational that they should not be offered conditions similar to those offered to medical men It is for the medical profession as a whole, and women doctors in particular, to protest firmly against this discrimination The Medical Women's Federation proposes (p 487) that for the present women doctors, while accepting "relative rank," should not accept commissions in the women's forces

THERAPY OF GONOCOCCAL INFECTION

GONOCOCCAL infection is usually confined to a local invasion of the mucous membrane of the lower genito-urinary tract, but the invading organisms may penetrate deeply before the defensive forces stabilise the front, often assisted by such fifth-columnists as alcohol, physical exertion and further sexual excitement Treatment acting through the blood-stream should thus enjoy an advantage over purely local measures and the sulphonamides act in this way Theoretical considerations also indicate that a potent chemotherapeutic drug should be given in doses big enough to ensure the rapid attainment and maintenance of the optimum blood level of its active constituent Furthermore, the help that local measures can contribute is largely of a mechanical nature only, and unless innocuous to the infected tissues they may be better withheld Growing experience of the chemotherapy of gonorrhœa has led to a widening appreciation of these principles and a scientific approach to treatment is now more, and not less, important than before the introduction of these drugs

Sulphapyridine has proved its superiority over the earlier sulphanilamide preparations and experience is now sufficient for its value to be assessed It is of inestimable value in the treatment of gonorrhœa in Service cases, and the wastage of man-power from this disease in the present war contrasts favourably with that during the last The treatment of Service cases in hospital has encouraged the use of intensive dosage along the lines first reported by BOWIE and his colleagues[1] In such courses[2] about 22 g of sulphapyridine is given in 48–72 hours but the results recorded are no better than those obtained with more moderate dosage On another page FAIRBROTHER, AYMER and ASHTON report that large doses do not produce proportionately high blood levels, that clinical cure may be achieved in some cases in which the blood sulphapyridine level is low, and that failure may occur in the presence of a high blood level LAIRD claims that a high fluid intake and urethral lavage are of value in reducing the number of failures, the time for clinical cure, the relapse-rate and the incidence of acute complications during and following chemotherapy Some of this experience in Service cases is applicable to outpatients, in whom one 0 5 g tablet of sulphapyridine four-hourly or the 2 1 1 2 daily tablet scheme constitutes a satisfactory regime for those who must continue at work Hæmaturia may develop in cases receiving the larger doses of sulphapyridine,[3] and the importance of a daily fluid intake of at least five pints cannot be overstated Vomiting is sometimes troublesome, and being central in origin may be favourably influenced by bromides given before and during chemotherapy Agranulocytosis is rare, especially when the drug is limited to 30 g given in less than ten days In the female sulphapyridine is equally successful A dosage of 0 5 g four times a day or even four-hourly gives excellent results and is well tolerated by outpatients[4] Chemotherapy should begin as soon as a diagnosis is made and continue until about 20 g has been administered Whenever possible it should be combined with rest during the first menstrual period to prevent extension of the infection to the pelvic organs Local treatment is usually unnecessary, and, apart from a daily hip bath followed by powder, should be discouraged Bartholinian abscess and salpingitis subside rapidly without local interference but infection of Skene's ducts requires local cautery *Trichomonas vaginalis* infection is uninflu-

---

1 Bowie, F J T Anderson, T E, Dawson, A and Mackay, J *Brit med J* 1939, i, 711

2 King A J and Williams, D I *Brit J vener Dis* 1941, 17 202, MacKenna R M B and Wordingham, R T *Ibid*, p 222

3 See Laird S M *Lancet* 1941 ii, 272, annotation, *Ibid* p 640

4 Moffett, M *Brit med J* 1940, ii, 8, Rawlins, M *Brit J vener Dis* 1940 16 232

nced by the sulphonamides and its presence should always be excluded in gonorrhœa cases in which sulphapyridine fails to abate the discharge Chemotherapy has changed the outlook in vulvovaginitis in children and is superior to œstrin, being being free from its undesirable side-effects As in adults local treatment is contra-indicated except for the hip bath and powder Relapse may occur, and long observation using cultural methods is therefore still required The period of initial hospitalisation and exclusion from school, however, is much less than was formerly necessary[5] Ophthalmia neonatorum, gonococcal and otherwise, has also lost its former terrors SORSBY and his colleagues[6] have reported brilliant results rom oral sulphapyridine in 273 cases Full dosage hould be used and local treatment by irrigation with 5% saline followed by instillation of liquid paraffin s seldom necessary after the first day Corneal ulceration responds rapidly and seldom occurs after chemotherapy has been begun When it is present 1% atropine sulphate drops should be instilled thrice daily Preliminary reports indicate that sulphathiazole and sulphadiazine are at least as effective as sulphapyridine in the treatment of gonococcal infection and are more free from troublesome side-effects That a true "therapia sterilisans magna" may yet be achieved is foreshadowed by the reports of MIESCHER[7] and RAMEL[8] MIESCHER systematically progressed from a six-day treatment to a one-dose administration of sulphathiazole without adjuvant treatment, the single dose varying from ten to four 0 5 g tablets The results claimed were excellent and it is possible that the lime-blossom tea, used to wash down the powdered tablets, favoured absorption of the drug by reducing gastric acidity

Failure to respond to chemotherapy is most often due to a "closed" focus of infection and the discovery and local treatment of all such foci are essential Drug resistance may explain some of the failures but the possibility of failure of the patient's own immunological response to infection should be kept in mind It seems probable that the benefit which may follow intravenous TAB vaccine results more from stimulation of the patient's reticulo-endothelial system than from any direct action of the induced pyrexia on the organisms While chemotherapy is most successful in uncomplicated gonorrhœa it is highly effective also in epididymitis, peri-urethral abscess, acute posterior urethritis, bartholinian abscess, salpingitis, iritis and conjunctivitis It is often disappointing in acute arthritis and tenosynovitis and seldom of value in chronic arthritis and keratodermia blenorrhagica Its success in the metastatic complications depends on the skilful use of all available measures directed to the elimination of the primary focus of infection In such cases pyretotherapy, using the Kettering hypertherm, therapeutic malaria or intravenous TAB vaccine often produces striking results While the treatment of gonorrhœa has thus been revolutionised the assessment of cure still demands adequate observation and stringent tests, including the more widespread use of cultural methods The rapid abatement of symptoms has led to an increased defaulter-rate in clinic practice, and the apparent simplification of therapy has encouraged the treatment of gonococcal infection by practitioners insufficiently equipped to carry out proper assessment of cure Unless these tendencies are overcome the epidemiological position of gonorrhœa in this country may become worse than it was before the introduction of chemotherapy

---

[5] Rice J L, Cohn A, Steer, A and Adler, E L *J Amer med Ass* 1941, 117, 1766
[6] Sorsby, A, Hoffa, E L Smellie, E W *Brit med J* 1942, i, 323
[7] Miescher G *Schweiz med Wschr* 1940 70, 891
[8] Ramel, E *Rev méd Suisse rom* 1940, 60, 602

Annotations

THE BALANCE OF SEX

THE minds of many of us, as Lake[1] has remarked, revolt from the thought that anything in man's body may be ill-designed or imperfect, preferring to believe that all disease must be the result of noxious attack from without In this mentality there is something of the Hitlerian creed Others carry the fallacy a step further and seek to find in bodily ills or malformations an excuse for sickness really of the mind A few years ago it was fashionable to explain away all psychology in terms of the internal secretions of "the glands of destiny" Shelley's genius depended on his thyroid and Byron's on his gonads Had not physiology intervened, opinion might have slipped back three hundred years and replaced the soul in the pineal As in many fads, there was a grain of truth in this The sensations of fear, apprehension and anxiety may be reproduced by the injection of adrenaline The hyperthyroid patient is excitable or even maniacal Hypertrophy of the adrenal cortex may give to a previously normal girl not only the look but the outlook of a man The end of gonadal secretion may turn a placid and affectionate woman into an irritable termagant or an energetic and cheerful man into a melancholy sluggard These changes occur through alterations in the concentrations of substances which normally bathe every somatic cell and are therefore correctly regarded not as new conditions brought about by external attack but as exaggerations of changes which take place from day to day unnoticed in the normal person There is so much of the female in the most masculine of us and so much male in the most feminine that it ill behoves any to speak ill of the intersexual That homesexuality is usually psychologically determined seems certain, but the cells of all of us are bathed in both œstrogens and androgens, and we need not turn to the hermaphrodites to find the results of quantitative imbalance Draper[2] has pointed out that in a male ward the neat, quiet placid patient is conspicuously rare, and in a female ward the restless dominant woman The former is often found to have a suggestion of a feminine physique, the small muscles, and the fat-determined contours of the girl, whereas the latter may have much of the man about her, the deep voice, powerfully moulded forehead and prominent jaw Geddes and Thompson[3] have put the same thought less pictorially by saying that femaleness is correlated with preponderant anabolism, maleness with emphatic katabolism, a view supported by the fact that the average basal metabolic rate of women is lower than that of men

Most textbooks of medicine begin the description of a disorder with a statement of its relevant frequency in the two sexes, but few readers stop at this point to consider its significance A scale can be constructed of the sex-incidence of diseases and the one published by Draper ranges from gout (98% males) and Marie-Strümpell spondylitis (91% males) at one end to hyperthyroidism (91% females) and Heberden's nodes (97% females) at the other At the extremes, metabolic factors in general and endocrine ones in particular, or social usage (alcoholism, 84% males) may give a hazy notion of the underlying cause for these great differences of distribution, but in the middle of the nosographical spectrum the explanation is more obscure Why, for instance, are 67% of cases of whooping-cough female and of chronic glomerular nephritis male? Why should duodenal ulcer be predominantly male (83%) while gastric ulcer takes an almost middle path (57% male)? As Diaper says, such charts have been constructed on the view that men are men because they have testicles and women women because they have ovaries "The concept of non-genital androgyny has not been introduced Yet the very nature of the shifting curve apparent in the chart, which moves almost continuously from one sex predominance to the other, suggests a susceptibility gradient rather than two diametrically opposed sex types" He suggests that often the patients with a disease commoner in the opposite sex show on careful examination physical attributes inappropriate to their own, and quotes Motley's picture of Margaret of Parma, "with her imperious temper, her masculine appearance, her moustache and her gout" This suggests a new ward game, in which marks are given for various andric and gynic qualities in the patients other than the sex of their gonads Their sex would thus be represented not as M or F, but as quantities to the M or F side of the isosexual point If the sexual chart of disease is afterwards reconstructed, will we find that all disorders achieve the admirable impartiality of pernicious anæmia, which, even on the rough criteria of the gonads, affects the sexes with equal frequency?

---

[1] Lake, N C *Brit med J* 1942, i 31
[2] Draper, G *New Engl J Med* 1941, 225 393
[3] Geddes, P, Thompson, J A The Evolution of Sex, London 1901

PROGNOSIS IN STAPHYLOCOCCAL SEPTICÆMIA

STAPHYLOCOCCAL septicæmia has a case-fatality which varies in different series from 60% to 90%, if osteomyelitis with positive blood-culture is excluded In recent years claims for the therapeutic value of staphylococcal antitoxin, bacteriophage and the sulphonamides, particularly sulphathiazole, have been made either because of apparent success in isolated cases or from an improved fatality-rate in comparison with a series of untreated cases in preceding years Unfortunately there are few reliable criteria for prognosis in staphylococcal septicæmia McLellan and Goldbloom[1] believe that increasing interest in new therapies has led to the discovery of a greater number of mild cases through more frequent blood culture, with a resulting unjustified optimism about the worth of these remedies For example, in their own experience the case fatality was 80% among 15 cases in 1933–36, when the ratio of blood culture to total admissions was 1 32 9, whereas it fell to 50% among 28 cases during 1937–40 when the corresponding ratio was 1 22 9 They attribute cure of only 2 of their cases to specific treatment They suggest as favourable prognostic guides of some value a history of antecedent localised staphylococcal infection or a coexisting local lesion, and a low colony count from the blood culture Among their cases which survived, 9 out of 16 had some evidence of previous or coincidental localised skin infection, among 17 patients who died only 6 had a local lesion, of whom one probably died from a massive dose of intravenous antitoxin, while 2 others survived for 68 and 86 days Superficial abscess formation in a generalised staphylococcal infection has, in the experience of others, been a favourable prognostic sign, and it is a question whether the fixation abscess should not be induced more often in staphylococcal septicæmia, for experimentally it has been found to save the lives of mice with streptococcal septicæmia On the other hand, some surgeons believe the local lesion should be excised to prevent continuous seeding into the blood-stream from this septic focus As regards blood-culture, a quantitative colony count should be a routine procedure in all cases of suspected septicæmia, 1 c cm of blood can be added to melted agar and poured into a plate at the bedside, or the blood can be taken into 'Liquoid'[2] and the different media inoculated at leisure in the laboratory Irregular bacteræmia is to be found in cases of carbuncle or other localised staphylococcal infections which should not therefore be regarded as true septicæmias It is difficult in staphylococcal infections to draw a dividing line between bacteræmia and septicæmia, but any case with 5–10 organisms in 1 c cm of blood on two or more *occasions should be included in the septicæmic group* McLellan and Goldbloom regard a colony count of 20 or over per c cm as a bad prognostic sign Of their 16 surviving cases only 2 had counts over 20 organisms per c cm whereas all but 4 of the 17 fatal cases had counts varying from 20 to 500 or more, of the 4 exceptions, 3 had initial colony counts of 1, 17 and 19 and the *last case died before blood culture could be done* They give a useful review of reported cases, which support their contention that a local lesion and a low colony count together or independently are reasonably reliable guides for a good prognosis in staphylococcal septicæmia, and it may be hoped that other workers will use these criteria when recording the results obtained with the newer remedies In both of the cases reported on another page by Flowers and his colleagues the infection became localised in a bone, and in both the colony count were in the neighbourhood of 10 per c cm The prognosis may, then, have been less desperate than the patients' clinical condition suggested Nevertheless, these cases demonstrate that sulphathiazole can be pushed much beyond the generally accepted limits of safety, even if such toxic reactions as drug fever and rashes appear—it is for the clinician to decide whether the toxicity of the drug or of the infection is the more dangerous These patients received 232 g and 169 g of sulphathiazole, and both survived Long and Longacre,[3] in a small experimental and clinical study, demonstrated that cases of *staphylococcal septicæmia can be divided into* those whose plasma protein levels rise to normal or above with treatment and who will recover, and those in which the levels remain subnormal They emphasise the value of large transfusions of whole blood or plasma A high antitoxic immunity is valuable in localising experimental infections,[4] and further trial might be made of very large doses of antitoxin—20,000–40,000 units intramuscularly followed in 4–6 hours by 40,000–60,000 units intravenously—as recommended by Baker and Shands[5] who found the Arneth count a help in assessing the need for and value of antitoxin therapy

FOOD TO WORK ON

"CANTEENS," we say, "are the thing," feeling in our enthusiasm that all is well industrial workers will now be capably fed But a comprehensive and effective canteen system is not set up in a moment In an inquiry[6] into British war production Mass Observation reviews the feeding of workers at its present stage of development Canteens are now obligatory in large firms doing munition work, but many firms have undertaken the task reluctantly and inadequately Thus one managing director complained bitterly that since the canteen had been opened his workers knocked off early in order to be able to make a dash to it as soon as the lunch hour struck, his firm employed 2000 workers and provided *canteen facilities for 300* A few firms take a pride in their canteens Small firms are not obliged to provide canteens, and when resources and premises are limited it is sometimes beyond their power to do so, but where such a firm is placed in a remote country district, lack of a canteen means considerable hardship Since ell over nine-tenths of the country's factories employ ss than 250 workers, and since nearly half the workers the country are employed by small firms, the need for ore canteens, or for some alternative plan, is not rivial It seems that nearly all new factories plan for anteens from the outset, and two thirds of the large rms now have effective ones, according to an official stimate, factory canteens are now being opened at the ate of 100 a month, in July, 1941, the total number had eached 4000, but there seems to have been no full ount since Shortage of qualified staff, of equipment nd cutlery, building difficulties where premises are not vailable, and the conviction of some business men that canteen *must* be run at a profit have all helped to check progress Yet the inquiry quotes the statement of the Engineering Industries Association that by installing a canteen one firm saved £12,000 a year on time previously lost through workers preparing snack meals at the bench

---

[1] McLellan, N W, Goldbloom, A *Canad med Ass J* 1942, 46, 136

[2] Roche Products Sodium polyanethol sulphonate See Penfold J B, Goldman, J and Fairbrother, R W *Lancet* 1940, i, 65

[3] Long, C H and Longacre, A B *Surg Gynec Obstet* 1942, 74, 353

[4] Downie A W *J Path Bact* 1937, 44, 573

[5] Baker L D, Shands, A R *J Amer med Ass* 1939, 113, 2119

[6] Part I—People in Production London Advertising Service Guild 10*s*

Besides saving time and trouble for workers a good canteen, of course, should supplement diet and thus help to maintain health No reliable statistics seem to be available about the effects of diet on work, but the Oxford Nutrition Survey is undertaking a study The inquiry quotes a welfare manager who found that during the heavy snowfalls early this year a girl of nearly 15, who lived 4½ miles away from the factory, was walking to work and arriving before 8 every morning, she said that she knew if she could get to work she would be sure of her dinner—which suggests that in her case, at least, diet and work were closely bonded Where canteens are not to be had British restaurants sometimes supply the deficiency, but they are mostly in the middle of towns, and since they make no discrimination among customers, workers may not be able to get fed there in time Moreover the supply of these restaurants is still below the demand, by the end of 1941 there were 1207 special feeding centres in Great Britain, of which only 517 were British restaurants in the strict sense, the others being evacuee centres, centres provided by local authorities on their own responsibility, voluntary organisations, centres set up during raids and Londoners' Meals Service centres The public are enthusiastic about British restaurants, but the caterers oppose them Since, however, commercial catering has not been able to meet the demand, and since Mass-Observation finds that 96% of people who have eaten a meal in a British restaurant like it, there seems good reason for putting these convenient war time centres within reach of workers who need them, especially since this is a matter affecting production as well as health Lord Woolton has assured caterers that before any more British restaurants are opened the Ministry of Food will consult the trade, he might go further, and say that before any plan to open a British restaurant is turned down he will consult the workers

THIRD SUPPLEMENT TO THE BPC

SINCE the war started there have been two supplements to the British Pharmaceutical Codex 1934, one on surgical dressings and the other containing new formulæ The third and largest supplement,[1] now issued, contains 80 new monographs or submonographs They include substances which have received official recognition in the four addenda to the BP 1932, but also many others, the most notable perhaps being sulphapyridine and sulphathiazole Standards are laid down for non-pharmacopœial substances and the BP standards are summarised There is the usual informative summary of actions and uses for each substance, BP or otherwise Many of the newcomers were once imported but are now manufactured here under the provisions of the 1939 patents legislation, and for these the names suggested by the Therapeutic Trials Committee have been adopted throughout In future we can write BPC after

Acetomenaphthone (vitamin-K analogue), amphetamine, amphetamine sulphate ('Benzedrine Sulphate'), cetyl alcohol, chloroxylenol (antiseptic), solution of diodone, diphenan ('Butolan,' 'Oxylan'), dithranol ('Anthralin,' 'Cignolin,' 'Derobin'), anhydrous ephedrine, menaphthone (vitamin K analogue), mesulphen ('Mitigal,' 'Sudermo'), methyl hydroxybenzoate (preservative), aromatic oil of pine, phenytoin soluble (sodium diphenylhydantoinate, 'Epanutin,' 'Eptoin,' 'Solantoin'), progesterone, propyl hydroxybenzoate ('Nipasol M,' preservative), raspberry leaf, ricinoleic acid (constituent of bactericidal soaps), sphagnum, stilbœstrol, staphylococcus toxoid, sulphacetamide ('Albucid'), sulphapyridine, sulphathiazole, terpineol (aromatic antiseptic), testosterone (an androgen), testosterone propionate (the same but more soluble in oily media), and tocopheryl acetate (vitamin E analogue)

Many of these are still most familiar by their proprietary names, and it would have helped rather than hindered the general adoption of the official nomenclature if these could have been added in each monograph This defect is partly corrected by the revision of Appendix xiv in this supplement, which gives the composition and brief particulars of proprietary preparations, but only works one way The Latin tables are, of course, retained and must be until the whole BPC is revised Their continued use in everyday prescribing must be blamed on the handiness of their shortened form Many of us would be doubtful of the terminations of histaminæ phosphas acidus, yet would cheerfully order histam phosph acid

DOUBTS ON VITAMIN K FOR THE NEWBORN

THE story of lowered prothrombin values in the blood of newborn babies, hæmorrhagic manifestations and the use of vitamin K or its chemical analogues in prevention and treatment sounded too simple for many pædiatricians, and they have been patiently waiting for further evidence or collecting it for themselves, like H N Sanford, Irene Shmigelsky and Josephine M Chapin of Bush Medical College, Chicago These workers now report[1] what is essentially a failure to establish a satisfactory relationship between the first two conditions named above and throw considerable doubt on the value of the third Briefly they studied prothrombin levels in the cord blood and venous blood withdrawn for at least five consecutive days after birth in 711 infants given vitamin K either directly or in a small number of instances indirectly by giving this substance in synthetic form to the mother before the birth of the baby Similar studies were made on a control group of 982 newborn babies receiving no vitamin K The now familiar results were obtained—a drop in the control group of blood prothrombin on the third day of life to low levels whereas in the indirectly protected infants the drop was much less severe and in the directly protected babies even less So far this is on orthodox lines but the Chicago workers introduce the element of doubt when they compare hæmorrhagic manifestations in the two groups

Type	Untreated infants (982)	Per cent	Infants given vitamin K (711)	Per cent
Conjunctival	21	2 1	12	1 7
Vaginal	11	1 1	8	1 1
Cephalhæmatoma	7	0 7	5	0 7
Petechial and ecchymosis	6	0 6	6	0 84
Cerebral	5	0 5	4	0 56
Hæmatemesis	5	0 5	4	0 56
Umbilical	5	0 5	3	0 42
Circumcision	3	0 3	3	0 42
Melæna (bowel)	3	0 3	2	0 29
Total	66	6 6	47	6 59

Discussing these surprising results in more detail they point out that there was no correlation between prothrombin level and hæmorrhagic tendencies The mortality-rates in the two series were identical and among premature infants there were 7 deaths in each group out of 45 control and 48 vitamin-K treated infants respectively It is clear that enough vitamin K was given, for the usual results on the blood prothrombin were obtained The Chicago pædiatricians say that the explanation for these results must lie in two directions "Either we do not know what hæmorrhagic disease is, or there is a marked difference in our newborn babies as compared to other localities" The latter possibility raises questions of maternal diet, seasonal incidence and other problems which can be summed up in the possibility that careful antenatal care may play a part in preventing hæmorrhages in the newborn This point is capable of statistical study and could be quickly settled The former possibility is, of course, the crux of the matter It is palpably absurd to lump all hæmorrhagic manifestations of the newborn together and pretend that this is a "hæmorrhagic disease" due to prothrombin deficiency and preventable and curable by giving vitamin K Whatever the facts as regard adult prothrombin levels and hæmorrhages may be the problem in the newborn is not so simple, and the Chicago workers have done well to introduce the necessary element of scientific doubt into what was threatening to become almost a simplified romance, with disappointment round the corner for those who pinned their faith to vitamin K to the neglect of other factors

---

[1] Third Supplement to the British Pharmaceutical Codex 1934 Part I—Monographs, 1942 London Pharmaceutical Press Pp 101

[1] *J Amer med Ass* 1942, 118, 697

BLOOD IN THE STOOLS

IN those medical emergencies characterised by bleeding into the alimentary tract it is important for the clinician to know now much significance can be attached to the appearance of blood in the stools L Schiff, R J Stevens, N Shapiro and S Goodman[1] have tried to clarify matters by giving citrated blood by mouth Their experiments fall into three groups In the first they determined the amount of blood necessary to produce a tarry stool—defined as "a glistening stool having the same black colour as found on a standard paint colour chart" Citrated venous blood, two to three weeks old, was mixed with soda-water (100–200 c cm) to disguise the taste and given by mouth to three normals and fifteen ward patients A normal diet was allowed and drugs known to discolour the stools were prohibited The amount of blood was varied in quantity and it was found that at least 100 c cm of blood was necessary to produce a tarry stool—or to put it the other way round from the practical standpoint—a tarry stool may result from as little as 100 c cm of blood The second experiment was concerned with the time of appearance of bloody or tarry stools after intragastric administration of citrated blood The blood was three weeks old, from a blood bank, and was given at room temperature by stomach-tube in quantities of 1000–2000 c cm The smaller quantities were allowed to flow in by gravity during a period of thirty to sixty minutes The large amounts were given in divided doses of 700, 700 and 600 c cm at four-hourly intervals An injection of codeine sulphate, gr 1, and atropine sulphate, gr $\frac{1}{150}$, was given hypodermically before the blood to prevent too rapid passage through the alimentary tract Despite this measure, blood appeared in the stools within four hours and a patient's stools might be entirely bloody and were tarry after intragastric administration Neither the appearance—bloody or tarry—nor the number of bloody or tarry stools was directly related to the quantity of blood given None of the subjects vomited the blood Bloody stools may be passed for as long as three days and tarry stools for as long as four days after a single draught of blood Thirdly, experiments were performed to determine the duration of a positive test for occult blood in the stools after oral or intragastric administration of citrated blood After a single large dose of blood the stools gave a positive test for as long as fourteen days, all the patients were of course kept on a meat free, vegetable free diet during the tests and had a preliminary negative test for occult blood in the stool From these observations it seems that a tarry stool does not necessarily indicate a severe hæmorrhage into the digestive tract and that the persistence of tarry stools or occult blood does not necessarily indicate the continuation of such hæmorrhage

SURGERY AT PEARL HARBOUR

ON Dec 3 Dr J J Moorhead of New York arrived in Honolulu at the invitation of the local medical society to deliver a series of lectures on the principles of traumatic surgery Four days later, now acting colonel in the Army Medical Corps, he found himself supervising the application of these principles in treating the victims of the attack on Pearl Harbour He describes[1] the inevitable confusion caused by the influx of a large number of casualties, but soon eight operating teams were on duty and worked continuously for 11 hours, after which regular 6-hour shifts were organised The numerous and varied casualties consisted largely of the multiple lacerated wounds and compound fractures which have made up the bulk of air raid casualties here, and treatment was on familiar lines Initial morphine and blood- or plasma transfusion were followed by cleansing, moderate excision, local sulphathiazole, and, when possible, delayed primary suture, primary suture was never employed and closed plaster was applied only for minor compound injuries Moorhead found very useful for the localisation of metallic foreign bodies the radio-frequency probe which has been used by the Germans in this war and described in these columns[2], this is an electromagnetic induction apparatus which registers the surface position and depth of the fragment and gives audible warning when it is approached by a metal probe In one case, with a bullet lodged in the spinal canal, this instrument provided the only means of successful extraction Another dramatic procedure was the removal of intrathoracic fragments under the radiographic screen by means of a long clamp introduced through a stab intercostal wound, this, perhaps, will not be universally approved though it was found to give gratifying results Summing up the lessons learned at Pearl Harbour, Moorhead emphasise the low operative mortality of 3 8%, the almost complete prevention of suppuration and the absence of deaths from gas-gangrene, and the excellence of the late results All of these were in striking contrast to experience in the first World War, but circumstances were particularly favourable The wounded were received within 6 hours, preliminary treatment for shock was available and climatic conditions were excellent, the standard of surgical skill was high and aftercare was adequate and continuous The results demonstrate the value of a careful and preconceived plan of treatment

As part of the Ministry of Health's policy to make the Central Council for Health Education the sole body responsible for popular health education in England and Wales, last week the Central Council took over educational work for the prevention and treatment of venereal diseases hitherto undertaken for local authorities by the British Social Hygiene Council The BSHC will continue as a voluntary organisation and carry on with its colonial and international work on the control of venereal disease and the social implications of these diseases in Great Britain It will concentrate on problems of social biology, including preparation for marriage, the adjustment of personal problems and the application of present knowledge of the biological sciences to social problems of today, particularly those related to the war effort The BSHC may be addressed at Tavistock House South, Tavistock Square, London, W C 1

---

[1] *Amer. J med Sci* 1942, 203, 409

[1] Moorhead J J *J Amer med Ass* 1942, 118, 712

[2] See *Lancet*, 1941, i, 699, Farmer, F T and Osborn, S B *Ibid*, 1941, ii, 517

Special Articles

CONTROL OF RICKETTSIAS
IMMUNISATION AGAINST INFECTION

G W M FINDLAY CBE SC D.

LITTLE has so far been learnt of the control of rickettsial infections either by chemotherapeutic or specific treatment No human rickettsiases appear to be influenced in any way by members of the sulphonamide group of drugs although Nietz (1939 and 1940) has found that *R ruminantium* the causal agent of heart-water can be influenced in sheep by injections of 'Uleron' (Bayer), while *R canis* infections in dogs can also be cured by sulphanilamide Injections of immune or hyperimmune serum given during the incubation period or during the first few days of the illness have been found by Weigl (1937) and others to abort or curtail the infection Hyperimmune sera prepared in the horse and rabbit are possibly of more value than convalescent serum

A vaccine to be of value against a human rickettsial infection must fulfil certain conditions (1) it must produce a high degree of immunity which lasts for a considerable period (2) it must not produce dangerous reactions nor render the individual a danger to his companions (3) it must be easily produced in large quantities and must be easily administered Not all the vaccines suggested for use in man can be said to comply with these requisites Vaccines, however have been prepared against exanthematic and murine typhus, Rocky Mountain spotted fever and more recently Q fever

Most attention has naturally been directed to finding an efficient means of immunising against exanthematic typhus Two methods of inoculation have been suggested

LIVING MURINE TYPHUS VACCINE

In view of the fact that the rickettsia of murine typhus is closely related to that of exanthematic typhus and that the former produces a much milder disease than the latter, experiments have been made on the effect of injecting murine typhus rickettsias into man In Tunis Laigret and his colleagues (1937 1939) have employed a strain of murine typhus passaged in the brains of mice The mouse brains are ground up and dried in egg yolk and sodium phosphate In Morocco Blanc and Baltazard (1940) have used two methods In the first the infected tissues of guinea-pigs are ground up in physiological saline and immediately before injection the suspension is treated with bile In the second the dried fæces of rat fleas (*Xenopsylla cheopis*) infected with murine typhus rickettsias are mixed with bile before injection. In Tunis roughly a tenth of the indigenous population are said to have been injected with the mouse-brain egg-yolk vaccine As a general rule the injections have been given in areas where epidemics of exanthematic typhus are actually occurring and according to those who have carried out the injections reactions among natives have been minimal, localised epidemics have been rapidly brought to an end and endemic foci where the majority of the inhabitants have been vaccinated have remained free from fresh outbreaks for from two to three years Severe criticism has been directed against inoculation with the egg-yolk vaccine In Europeans, as well as in some natives severe reactions have followed the injection and the rickettsias of murine typhus have been isolated from the blood Absence of reaction has been attributed to the fact that a high percentage of the persons inoculated were previously immune to typhus while in view of the possible conversion of murine into exanthematic typhus, the widespread dissemination of murine typhus among a population heavily infested with lice would seem to be not without its dangers In Spain the Laigret vaccine gave unsatisfactory results (Romero Escacena 1941) Very similar criticisms can be urged against the use of bile-treated rickettsias In the case of Europeans the reactions are too severe to allow of its general use, while in the case of African natives judgment must be suspended until critical and adequately controlled experiments have been performed Sparrow and Mareschal (1938 and 1939), using a particularly mild murine strain, have found that infections were modified to some extent if rickettsias were inoculated directly into the conjunctival sac Temperatures between 103° and 104° F were however not uncommon some fifteen days after the inoculation, and in many cases the febrile reactions lasted for as long as ten days In Japan an attempt has been made to immunise against tsutsugamushi disease by injections of an attenuated strain of the living rickettsias from the island of Formosa

KILLED EXANTHEMATIC TYPHUS VACCINE

The earliest of the attempts to use killed rickettsias for immunisation and up to the present the only one to be employed on a large scale is that of Weigl (1930 1937) This method consists of infecting lice per rectum with suspensions of living *R prowazeki* After a suitable interval the lice are killed, the intestines swarming with rickettsias are removed and ground up in a dilute solution of formalin in saline Although applied on a considerable scale in Poland this method also has certain disadvantages A very considerable number of lice, usually between 200 and 300 are required for the immunisation of a single individual As a result a large and skilled staff are necessary to superintend the inoculation and feeding of the lice while the cost of inoculating a single individual is necessarily high In addition the method cannot be used in countries such as Abyssinia where lice are normally heavily infected with rickettsias of the Rocha Lima type (cf Mariani 1940) A similar method, using ticks instead of lice has been employed by Spencer and Parker (1925) for vaccinating against Rocky Mountain spotted fever Parker (1935) stated that only 64 out of 150 000 persons vaccinated in the endemic area developed the disease while more recently it was found (Parker 1941) that among persons infected within one year of vaccination the mortality was only 8 11% as compared with 82 35% among unvaccinated controls Monteiro (1933) has used the tissues of the infected tick *Amblyomma cajennense* as a vaccine against São Paulo typhus Immunisation must be repeated at least once a year

The crux of the whole problem of immunising against rickettsial diseases with dead rickettsias lies in the difficulty of obtaining them in sufficiently large numbers Numerous efforts have been made to overcome this difficulty Thus the rickettsias have been grown in serum-tyrode mixtures containing chick embryo tissues (cf Nigg and Landsteiner 1930 and 1932), the resulting growth though sometimes luxuriant cannot always be maintained Zinsser Wei and Fitzpatrick (1937) used as a culture medium agar slopes on the surface of which was smeared chick embryo tissue mixed with a suspension of rickettsias Cox (1938 1939 and 1940) has found that injection of rickettsias from typhus Rocky Mountain spotted fever fièvre boutonneuse and Q fever into the yolk sac of the developing chick embryo yields a very rich growth of rickettsias Formolised or carbolised suspensions of rickettsias obtained by this method have been used prophylactically in the recent outbreak of typhus in Spain One dozen eggs yield about 100 c cm of vaccine enough to immunise thirty people Similar methods of producing vaccines have also been used in the case of murine typhus and Q fever

A somewhat different method has been used in Tunis by Durand and Giroud (1940) This consists in setting up a rickettsial pneumonia in mice or in rabbits removing the lungs at the height of the infection and by differential centrifugation of an emulsion obtaining a rich suspension of rickettsias relatively free from foreign matter The rickettsial suspension is then treated with formalin or phenol Although no reactions are caused by the injections it is necessary to administer four to five injections at intervals of five days A good immunity is produced against exanthematic typhus, for a number of persons immunised by this method have been subsequently injected with living cultures of *R prowazeki* without any ill effects Only a very partial immunity however is produced against murine typhus, although Castaneda (1941) has proposed the use against exanthematic typhus of a vaccine prepared from the lungs of rats infected with the rickettsias of murine typhus In countries where both exanthematic and murine typhus exist it would seem preferable to employ a mixture of both types of rickettsia in the vaccine

Up to the present no large-scale figures are available to determine which of these various methods of immunisation is likely to be most effective in controlling epidemics of exanthematic typhus in the field Preliminary results in man with the original egg-yolk vaccine have proved disappointing both in this country and in Germany (Wohlrab 1941) Nevertheless, use of the developing chick embryo and the fact that a variety of rickettsias can be adapted to the mouse lung justify a hope that the problem of obtaining rickettsias in sufficiently large quantities to constitute efficient vaccines is in a fair way to being solved

Specific immunisation, combined with destruction of the vectors together constitute measures which, if efficiently applied, bid fair to rid the human races of the scourge of rickettsial infections

REFERENCES

Blanc, G and Baltazard, M (1940) *Rev Hyg* **61**, 593
Castaneda, M R (1941) *Brit J exp Path* **22**, 167
Cox, H R (1938) *Publ Hlth Rep, Wash* **53**, 2241, (1939) *Ibid*, **54**, 1070, (1940) *Ibid*, **55**, 110, (1940) *Amer J Trop Med* **20**, 463
Durand, P, and Giroud, P (1940) *Arch Inst Pasteur, Tunis*, **29**, 25, (1940) *Ibid*, **29**, 234
Laigret, J, Belfort J and Lefaucheur, J (1937) *Arch Inst Pasteur, Tunis*, **26**, 153
— and Durand, P (1939) *Bull Acad Méd, Paris*, **122**, 84, and *Bull Soc Path exot* **32**, 735
Mariani, G (1940) *Minerva Med* No 4, p 69
Monteiro, J L (1933) *C R Soc Biol, Paris*, **115**, 1358
Nietz, W O (1939) *Berl tierarztl W schr* No 9, p 134, (1940) *J S Afr vet med Ass* **11**, 15
Nigg, C and Landsteiner, K (1930) *Proc Soc exp Biol, N Y* **28**, 3, (1932) *J exp Med* **55**, 653
Parker, R R (1935) *J inf Dis* **57**, 78, (1941) *Amer J trop Med* **21**, 385
Romero Escacena, G (1941) *Rev clin espan* **2**, 349
Sparrow, H and Mareschal P (1938) *Bull Acad Méd Paris*, **119**, 140, (1939) *Rev Immunol* **5**, 469
Spencer, R R and Parker, R R (1925) *Publ Hlth Rep, Wash* **40**, 2159
Weigl, R (1930) *Bull int Acad Cracovie, Classe de Méd* **4**, 25, (1937) *Arch Inst Pasteur Afr N* **26**, 665
Wohlrab, R (1941) *Med Klin* **37**, 532
Zinsser, H Wei, H and Fitzpatrick, F (1937) *Proc Soc exp Biol, N Y* **37**, 604

SCOTLAND

FOUR TERMS A YEAR

AT a graduation ceremony at Aberdeen University on April 2 Lord Meston, the chancellor, recalled that in 1937 representatives of the Scottish universities agreed to recommend that the medical curriculum be lengthened from the minimum period of 5 years or 15 academical terms Aberdeen adopted this recommendation and in October, 1938, all students beginning the study of medicine entered on the extended course of 5½ years or 17 academical terms When war broke out none of the other Scottish universities had introduced the longer curriculum and all of them decided to continue meantime with the old 15 terms, since if the new curriculum were to be carried through as originally planned there would be no medical graduates in 1943, for students starting in 1938 could not complete their course before April, 1944 Aberdeen had decided to carry on with the new course but had promoted an emergency ordinance which gave it powers to include in any calendar year a fourth academic term This it could do by running an extra term in the summer vacation The university had decided to make use of these powers and to accelerate the curriculum during the fourth and final years Students who completed their fourth academic year at the end of June, 1942, would take extra terms during the summer vacations of 1942 and 1943 and graduate at the end of September, 1943 He emphasised that this decision did not indicate any change of view regarding the importance of an extended curriculum, nor did it lend any support to the contention that there should be a general acceleration of the medical curriculum The sole purpose was to secure a steady flow of well-trained doctors

TOXÆMIAS OF PREGNANCY

In his Honyman-Gillespie lecture in Edinburgh on March 19 Dr Douglas Miller gave some observations on the eclamptic toxæmias and on hypertension and chronic nephritis in pregnancy Since Volhard's work in 1924 the view has increasingly gained ground that eclamptic toxæmia is to be regarded as a generalised vascular disease in many ways similar to essential hypertension The similarity is indicated by the lability of the blood-pressure in the early stages, and by the response to the cold-pressor test of Hines and Brown A familial tendency to hypertension is to be found in a significant number of toxic patients It is wise, however, to continue to regard eclampsia as an entity in itself peculiar to pregnancy Such terms as nephritis of pregnancy, nephritic toxæmia, occult nephritis and low reserve kidney should be discarded because they place undue emphasis on the rôle which the kidney plays and tend to obscure the fact that in toxæmia the disturbance is primarily a generalised vascular lesion, impairment of the kidney being either entirely absent or occurring only as an incidental or secondary effect There is no evidence that toxæmia is a manifestation of impaired kidney function, or that pre-existing chronic nephritis is ever in itself a cause of toxæmia

The prognosis of toxæmia uncomplicated by essential hypertension or chronic nephritis depends on the number and severity of certain features According to Eden, if two out of the following occur there is a fatality of 32% —deep coma, more than ten fits, pulse-rate over 120 per min, temperature over 103° F, systolic blood pressure over 200 mm Hg, urine solid with albumin on boiling If none of these is present the fatality does not exceed 7% A fall in blood-pressure without other signs of improvement is a very bad sign, indicating myocardial failure or peripheral circulatory collapse The severity of œdema bears little apparent relation to prognosis Some of the cases of "dry eclampsia" may be examples of hypertensive encephalopathy due to essential hypertension and not true eclampsia The after effects of toxæmia are cardiovascular rather than purely renal The incidence of permanent after-effects depends rather on the duration than the intensity of the toxæmia The frequency with which hypertensive disease follows toxæmia has been variously estimated Where pre-eclampsia or eclampsia develops in a woman previously healthy permanent cardiovascular damage will be sustained by at least 1 in 4 As regards the prognosis in pre-existing essential hypertension complicating pregnancy, it is probable that in half the cases pregnancy will aggravate the disease, and in 1 case in 3 the aggravation will not subside after delivery When chronic nephritis complicates pregnancy there is, as a rule, a progressive deterioration in the condition as pregnancy advances, and the fœtal and neonatal death-rate is very high With each successive pregnancy the aggravation in symptoms appears earlier and is more severe

The treatment of the eclampsias has undergone a fundamental change in the past two decades from radical to conservative Routine antenatal work has greatly improved the early recognition of the toxæmias Tribute must be paid to the work of Stroganoff and Tweedie In the detection of incipient toxæmia, determination of the blood-pressure level and of changes in weight are of greater importance than examination of the urine for albumin, since albuminuria may not appear until the toxic disturbance has been established for some time In an established case of moderate severity the patient is isolated in a quiet, dark room and not disturbed in any way, except for necessary treatment A retention catheter is passed and the urinary output measured two-hourly, together with the blood-pressure, temperature, pulse-rate and respiratory rate Constant observation by the doctor and nurse is necessary The lower bowel is cleared by an enema, but gastric and colonic lavage are omitted Sedative treatment consists in the administration of morphia, gr ¼, at once and three hourly until the seizures subside, unless the respiratory rate drops to 12 per min Chloral hydrate, gr 30, is given per rectum every eight hours, 20 c cm of a 10% solution of magnesium sulphate is injected slowly intravenously and may be repeated every twelve hours, 500 c cm of a 20% solution of glucose may also be given by the same route if œdema is severe Saline infusions are strongly contra-indicated, as are also sodium containing drugs in any form To avoid respiratory embarrassment maintenance of a free air-way is essential Pulmonary œdema associated with left ventricular failure is treated by intravenous glucose, the slow withdrawal of 500 c cm of blood, oxygen and rapid digitalisation If there are indications of peripheral circulatory collapse shock therapy is instituted Nothing is given by mouth until the patient is fully conscious Thereafter she is iven water, fruit juices and milk proceeding cautiously s the diuresis increases and watching the general condiion Dr Miller stressed that in pregnancy and in atients who may become toxæmic drastic restriction f protein and the forcing of fluids should be discouraged n so far as obstetric treatment is concerned, if the cervix s taken up and the uterus hardens on abdominal palpaion labour is induced by puncture of the membranes After the cervix is fully dilated delivery is completed in he most appropriate way Cæsarean section may very arely be performed in the severe case which is not esponding well to treatment and in which the reaction to induction is likely to be unsatisfactory In view of their action on the vascular system the ergot group of drugs should not be employed post partum

A SECURE PLACE OF REFUGE

The stigma which has attached itself to the word "asylum" has been giving trouble in Scotland People in Fife are apt to think that voluntary patients are not treated at the county asylum at Springfield, and many who can ill afford it are sending their relatives as paying atients to other mental hospitals, or keeping them at ome till it is too late to treat them successfully Dr Villiam Boyd, medical superintendent at Springfield as told the joint asylum committee that the wording f the Lunacy Acts precludes any change in the name f the institution, but efforts had been made and would e made again to revise these sections in the acts In he meantime when a new hospital was added to the sylum the opportunity was taken to christen it Stratheden Hospital, and Dr Boyd hoped that in time the whole institution would be known by this name The ommittee suggested that "asylum" should be changed o "mental hospital," "nerve institution," or "psychoogical institute" But the difficulty of keeping nomenlature ahead of popular prejudice was shown by a plea made the same day at a meeting of the Dundee branch of the Scottish Association for Mental Hygiene, when Dr D J Forbes, of Baldovan Institution, urged that the erm "institution" should be dropped Mr John Mann, headmaster of Fairmuir Special School, wanted to get rid of "mentally defective" and "feeble-minded" too Surely it is a pity to go on spoiling good words if the new name is soon to excite the same prejudice as the old

---

In England Now

A Running Commentary by Peripatetic Correspondents

GENERAL practitioners ought to be (and in rural areas certainly are) the handymen of medicine Many take great pleasure and a modest pride in the diversity of tasks they perform It is not unusual to find a general practitioner who is a sound physician, a good obstetrician, a reliable anæsthetist, no mean psychiatrist and even—within limits which he fully recognises in himself—a safe surgeon If and when the health-centre system becomes established, will the general practitioner still be permitted to exercise his hard-won skill in divers directions, or must he, forsaking all others, cleave only to one small specialty ? Must he, for instance, because he chooses to do obstetrics, give no more anæsthetics or perform no more herniotomies ? May not the doctor who looks after the pneumonias tackle an anxiety-neurosis or remove a tonsil or two by way of a change ? Variety and varied responsibilities are to some of us the spice of life If the new system converts the handyman into a limited and rigid sort of petty specialist the community, no less than the general practitioner himself, may lose more than it gains by the change

* * *

The cold weather—now happily passed, one hopes—brought into high relief the peculiarly ostrich-like attitude of the Englishman to his climate Is it because one's first lesson in geography lays down firmly and for ever that the Gulf Stream gives the British Isles an equable climate with mild winters, in contrast to those poor fish on the Continent ? In fact we do not, in general, have mild winters Not great cold, of course nor deep snow, but enough each year to cause endless annoyance, and in war-time serious loss to the war effort A Czech acquaintance, an engineer, travelled between Manchester and London during a cold snap, and his comments were all the more irritating for being justified Woken in his sleeper by the failure of the heating half-way to London several hours after he should have arrived there, he was told that the delay was due to "freezing of the points" "In my little backward country," he replied, "forty years ago when I was a boy we knew how to deal with frozen points, we sprinkled a little salt on them" "Was the heating system," he asked, "for use in summer or winter ?" Because, for technical reasons which I could hardly follow, it appeared to be designed so that in severe cold it would almost inevitably freeze between the carriages, thus ensuring that the occupants of the first carriage would be parboiled, while the rest froze Driven to loquacity by the memory of his frozen water-bottle, he described the efforts of a string of engines in a few inches of snow to leave their shed adjoining his works on three successive days Unable to bear it any longer he made his foreman knock up a snow-plough out of some "blitzed" pipes, and presented it to the engine-drivers with his compliments They were as pleased as a child with a new toy and sailed triumphantly out of the yard This should not be In a country pouring out millions a day on its war, a little money, time and thought expended on organising against winter dislocation would be well spent If we are inexperienced in such organisation there are plenty of refugee technicians from central Europe to advise us

In another department of life we allow ourselves to suffer seriously—and quite unnecessarily—from the effects of frost Winter after winter one hears the same tale of burst pipes, damage, discomfort and loss For this, I suppose, architects must be primarily to blame The ordinary man who builds, buys or rents a house looks to his architect or surveyor to advise and protect him against inconveniences or difficulties How is it that we are allowed to go on building, buying or renting homes with unlagged pipes running under the eaves with nothing but a few unlined tiles to protect them from the bitter North-Easter ? Is plumbing beneath the dignity of an architect, or does he just not think about it ? The Gulf Stream has a lot to answer for For that matter, why are our fireplaces and chimneys so often on the outside wall ? To warm the garden ? In December, 1918, in a miner's cottage at Frechen, near Cologne, I was laid low with 'flu There was no fireplace in the bedroom, but lo and behold the miner's wife opened a shutter in the wall and beautiful warm air, with no smoke, flowed in from the kitchen stove The battalion moved on in a hurry, and in any case I was not then interested in public-health questions, so that I never investigated the details, but if a German miner could have this in his cottage why can't we ? Perhaps some architects will reply

* * *

The farm lies in a hollow, out of sight of, and two wet and trackless fields away from, the nearest road I struggled down to it through the mud to find a pop-eyed and flea-bitten farmer in the throes of an attack of acute cholecystitis. Five times, very slowly and carefully, I explained to him and his mother what was amiss, that I expected the present attack to subside within a few days, but that he had better consider the advisability of having an operation to prevent further attacks, and prescribed measures for his immediate relief Next morning there came another urgent call to the same farm Once more I motored the six miles and trudged across the two fields to find the patient a good deal better "What is really wrong with him, doctor ?" asked his mother I drew a deep breath Five times, very slowly and carefully and mostly in words of one syllable or two, I described the condition, prescribed immediate treatment and advised admission to hospital at a not too distant date I took my leave of him and his mother saw me to the door I was about to depart when with arms akimbo she barred my way "And now, doctor," she said, "I wants vor you to tell me what is *really* the matter" I gave it up and fled

* * *

I have just read a book on the skin and its diseases, quite a good local guide-book, but it doesn't tell me much about the country as a whole—the "oneness" of

Up to the present no large-scale figures are available to determine which of these various methods of immunisation is likely to be most effective in controlling epidemics of exanthematic typhus in the field Preliminary results in man with the original egg-yolk vaccine have proved disappointing both in this country and in Germany (Wohlrab 1941) Nevertheless, use of the developing chick embryo and the fact that a variety of rickettsias can be adapted to the mouse lung justify a hope that the problem of obtaining rickettsias in sufficiently large quantities to constitute efficient vaccines is in a fair way to being solved

Specific immunisation, combined with destruction of the vectors together constitute measures which, if efficiently applied, bid fair to rid the human races of the scourge of rickettsial infections

REFERENCES

Blanc, G and Baltazard, M (1940) *Rev Hyg* 61, 593

Castaneda, M R (1941) *Brit J exp Path* 22, 167

Cox, H R (1938) *Publ Hlth Rep, Wash* 53, 2241, (1939) *Ibid*, 54, 1070, (1940) *Ibid*, 55, 110, (1940) *Amer J Trop Med* 20, 463

Durand, P, and Giroud, P (1940) *Arch Inst Pasteur, Tunis*, 29, 25, (1940) *Ibid*, 29, 234

Laigret, J, Belfort J and Lefaucheur, J (1937) *Arch Inst Pasteur, Tunis*, 26, 453

— and Durand, P (1939) *Bull Acad Med, Paris*, 122, 84, and *Bull Soc Path exot* 32, 735

Mariani, G (1940) *Minerva Med* No 4, p 69

Monteiro, J L (1933) *C R Soc Biol, Paris*, 115, 1358

Nietz, W O (1939) *Berl tierarztl Wschr* No 9, p 134, (1940) *J S Afr vet med Ass* 11, 15

Nigg, C and Landsteiner, K (1930) *Proc Soc exp Biol, N Y* 28, 3, (1932) *J exp Med* 55, 653

Parker, R R (1935) *J inf Dis* 57, 78, (1941) *Amer J trop Med* 21, 385

Romero Escacena, G (1941) *Rev clin espan* 2, 349

Sparrow, H and Mareschal P (1938) *Bull Acad Med Paris*, 119, 140, (1939) *Rev Immunol* 5, 469

Spencer, R P and Parker, R R (1925) *Publ Hlth Rep, Wash* 40, 2159

Weigl, R (1930) *Bull int Acad Cracovie, Classe de Méd* 4, 25, (1937) *Arch Inst Pasteur Afr N* 26, 665

Wohlrab, R (1941) *Med Klin* 37, 532

Zinsser, H, Wei, H and Fitzpatrick, F (1937) *Proc Soc exp Biol, N Y* 37, 604

SCOTLAND

FOUR TERMS A YEAR

AT a graduation ceremony at Aberdeen University on April 2 Lord Meston, the chancellor, recalled that in 1937 representatives of the Scottish universities agreed to recommend that the medical curriculum be lengthened from the minimum period of 5 years or 15 academical terms Aberdeen adopted this recommendation and in October, 1938, all students beginning the study of medicine entered on the extended course of 5½ years or 17 academical terms When war broke out none of the other Scottish universities had introduced the longer curriculum and all of them decided to continue meantime with the old 15 terms, since if the new curriculum were to be carried through as originally planned there would be no medical graduates in 1943, for students starting in 1938 could not complete their course before April, 1944 Aberdeen had decided to carry on with the new course but had promoted an emergency ordinance which gave it powers to include in any calendar year a fourth academic term This it could do by running an extra term in the summer vacation The university had decided to make use of these powers and to accelerate the curriculum during the fourth and final years Students who completed their fourth academic year at the end of June, 1942, would take extra terms during the summer vacations of 1942 and 1943 and graduate at the end of September, 1943 He emphasised that this decision did not indicate any change of view regarding the importance of an extended curriculum, nor did it lend any support to the contention that there should be a general acceleration of the medical curriculum The sole purpose was to secure a steady flow of well-trained doctors

TOXÆMIAS OF PREGNANCY

In his Honyman-Gillespie lecture in Edinburgh on March 19 Dr Douglas Miller gave some observations on the eclamptic toxæmias and on hypertension and chronic nephritis in pregnancy Since Volhard's work in 1924 the view has increasingly gained ground that eclamptic toxæmia is to be regarded as a generalised vascular disease in many ways similar to essential hypertension The similarity is indicated by the lability of the blood-pressure in the early stages, and by the response to the cold-pressor test of Hines and Brown. A familial tendency to hypertension is to be found in a significant number of toxic patients It is wise, however, to continue to regard eclampsia as an entity in itself peculiar to pregnancy Such terms as nephritis of pregnancy, nephritic toxæmia, occult nephritis and low reserve kidney should be discarded because they place undue emphasis on the rôle which the kidney plays and tend to obscure the fact that in toxæmia the disturbance is primarily a generalised vascular lesion, impairment of the kidney being either entirely absent or occurring only as an incidental or secondary effect There is no evidence that toxæmia is a manifestation of impaired kidney function, or that pre-existing chronic nephritis is ever in itself a cause of toxæmia

The prognosis of toxæmia uncomplicated by essential hypertension or chronic nephritis depends on the number and severity of certain features According to Eden, if two out of the following occur there is a fatality of 32% —deep coma, more than ten fits, pulse-rate over 120 per min, temperature over 103° F, systolic blood-pressure over 200 mm Hg, urine solid with albumin on boiling If none of these is present the fatality does not exceed 7% A fall in blood-pressure without other signs of improvement is a very bad sign, indicating myocardial failure or peripheral circulatory collapse The severity of œdema bears little apparent relation to prognosis Some of the cases of "dry eclampsia" may be examples of hypertensive encephalopathy due to essential hypertension and not true eclampsia The after-effects of toxæmia are cardiovascular rather than purely renal The incidence of permanent after-effects depends rather on the duration than the intensity of the toxæmia The frequency with which hypertensive disease follows toxæmia has been variously estimated Where pre-eclampsia or eclampsia develops in a woman previously healthy permanent cardiovascular damage will be sustained by at least 1 in 4 As regards the prognosis in pre-existing essential hypertension complicating pregnancy, it is probable that in half the cases pregnancy will aggravate the disease, and in 1 case in 3 the aggravation will not subside after delivery When chronic nephritis complicates pregnancy there is, as a rule, a progressive deterioration in the condition as pregnancy advances, and the fœtal and neonatal death-rate is very high With each successive pregnancy the aggravation in symptoms appears earlier and is more severe

The treatment of the eclampsias has undergone a fundamental change in the past two decades from radical to conservative Routine antenatal work has greatly improved the early recognition of the toxæmias Tribute must be paid to the work of Stroganoff and Tweedie In the detection of incipient toxæmia, determination of the blood-pressure level and of changes in weight are of greater importance than examination of the urine for albumin, since albuminuria may not appear until the toxic disturbance has been established for some time In an established case of moderate severity the patient is isolated in a quiet, dark room and not disturbed in any way, except for necessary treatment A retention catheter is passed and the urinary output measured two-hourly, together with the blood-pressure, temperature, pulse-rate and respiratory rate Constant observation by the doctor and nurse is necessary The lower bowel is cleared by an enema, but gastric and colonic lavage are omitted Sedative treatment consists in the administration of morphia, gr ¼, at once and three hourly until the seizures subside, unless the respiratory rate drops to 12 per min Chloral hydrate, gr 30, is given per rectum every eight hours, 20 c cm of a 10% solution of magnesium sulphate is injected slowly intravenously and may be repeated every twelve hours, 500 c cm of a 20% solution of glucose may also be given by the same route if œdema is severe Saline infusions are strongly contra-indicated, as are also sodium containing drugs in any form To avoid respiratory embarrassment maintenance of a free air-way is essential Pulmonary œdema associated with left ventricular failure is treated by intravenous glucose, the slow withdrawal of 500 c cm of blood, oxygen and rapid digitalisation If there are indications of peripheral circulatory collapse shock therapy is instituted Nothing is given by mouth until the patient is fully conscious Thereafter she is

Letters to the Editor

MEDICAL WOMEN WITH THE FORCES

SIR,—It seems desirable to the Medical Women's Federation to clarify the situation as to the difference in the terms and conditions offered to medical men and women serving with the Forces. The federation is anxious that women should respond to the appeal for women doctors in the Forces, but is profoundly disturbed that the long-established and well-proved principle of complete equality between medical men and women is being infringed, thus creating a precedent which paves the way for trouble now and in the future.

A medical man receives a commission *in the land forces* to serve in the RAMC or RAF medical branch. He is thus regarded in some degree as a soldier as well as a doctor; he may be asked to carry out certain combatant duties and is given general disciplinary powers. A medical woman is offered a commission *in the women's forces* for service *with* the RAMC and the RAF(MB). It is argued that there is no authority for offering a woman a commission in the land forces, and that a woman doctor cannot have disciplinary powers or any combatant duties.

The Medical Women's Federation has no grievance as to pay and allowances; on this score there is complete equality with their men colleagues, and they have "relative rank." The federation is fully aware that women doctors with the medical services are as a rule working happily under their commanding officers and that they have received fair and just treatment. However, they suffer definite handicaps. They are *not members of any* service, and they have no settled status. Regulations peculiar to them may be made at any time since RAMC, RAF(MB) and other service regulations do not necessarily apply to them. The Women's Services (Nursing, ATS, WAAFs) each have an established organisation and each woman is a part of her service; all have their status fully recognised and defined.

The Medical Women's Federation is strongly of the opinion that it would work for greater efficiency and stability to grant medical women commissions *in* the Medical Services; this would ensure a generally recognised status and the protection afforded by membership of a professional body having defined conditions and established precedents. The federation cannot see that there is any insuperable difficulty in creating if necessary a temporary women's section *in* the Medical Services, having appropriate functions and duties. In the event of an acute emergency, such as invasion, medical women would be expected to rise to the occasion just as medical men would do and in such circumstances it would unquestionably be easier for all concerned if they had well-defined rank and status. This argument applies with even more force in the event of conscription of medical women. The federation hopes that this course will be adopted. The present inequality of status is definitely a retrograde step, contrary to the principles which have been accepted as fundamental by the British Medical Association, and which have been found to work in the best interests of both medical men and women.

The federation feels that the course to take at present is to advise medical women to accept "relative rank" in the meantime, but *not to accept commissions in the Women's Forces*. This leaves the door open for a more equitable arrangement at any future date; whereas the acceptance of commissions in the Women's Forces will *permanently* put medical women in a separate category from their male colleagues.

CLARA STEWART,
President, Medical Women's Federation.

VITAMIN C IN TRANSPORTED MEALS

SIR,—The Ministry of Food has provided in many parts of the country large depots for supplying homeless persons with hot meals in cases of serious bombing, and use of these is being made on a large scale to supply canteens including school canteens, with hot dinners which have to be transported considerable distances and are kept warm in a hot-plate installation for prolonged periods. Now it is well known that in the case of vegetables treated in this way vitamins are lost or destroyed and on such a scale in the case of vitamin C (the scurvy-preventing vitamin) that the amount left might average less than 10% of the original quantity. It is also true to say that the persons who get these hot meals including school-children will be depending mainly on them to obtain their supply of this vitamin so essential to health.

I suggest therefore that in the coming spring, summer and autumn months, vegetables be served in the form of salads, for in salads nearly all the vitamins would remain preserved, or, if this is not possible, that ascorbic-acid tablets of at least 25 mg. should be given with each meal. Regarding the meals for school-children it has been suggested to me that raw grated turnip, kohlrabi or swede could be served with the hot dinners and to these I would add raw minced parsley, mustard and cress, or watercress, mixed with mashed potatoes. If this procedure were carried out first, salads could be more gradually introduced and given in larger amount until the children got used to them. If something of this kind is not done those partaking of these meals are neither receiving the benefit they should get nor being protected adequately against disease.

Glossop. E. H. M. MILLIGAN.

DIAGNOSIS OF PERNICIOUS ANÆMIA

SIR,—The letters of Professor Davidson and his co-workers and of Dr. Stark Murray call for comment because both represent retrograde views. I think the former are referring to their correspondence with me; they did me the honour of inquiring about the classification of erythroblasts that I, among others, have advocated. I endeavoured to explain as fully as is possible by correspondence and sending specimens, the basis used and the difficulties experienced in its application; in return they sent me some of their slides. They were, it seems, unconvinced by these efforts and, for my part, I thought that their technique was not that best adapted for the differentiation of megaloblasts and normoblasts and that in their good slides the differentiation could be quite easily made not only by myself but by others less experienced. The Edinburgh workers still thought their methods were best and they are, of course, entitled to their opinion, but they have had to adopt a classification which, though useful—and undoubtedly easier—for the special research they were engaged on is I feel uninformative and confusing. In ordinary times we would all have met and discussed our differences personally and not through correspondence only; I hope that by the time this is again possible the Edinburgh workers will either have become more convinced or have produced a more convincing alternative.

In your leader of March 21 you discuss which among the various systems of classification at present available is most useful to the clinician for diagnostic and therapeutic purposes. As I wrote on this subject as recently as August, 1941, I naturally support the view that what is most useful is whether a marrow is hyper- or hypoplastic or about normal, whether megaloblastic or normoblastic. By megaloblastic I mean that all members of the megaloblastic series, from early to late, are present and in significant numbers. It is known that megaloblastic marrow occurs in pernicious anæmia, in the refractory achrestic anæmia and in certain nutritional anæmias such as that accompanying sprue; apart from these, in my extensive experience normoblastic marrow is always present. Therefore megaloblastic marrow *is* of diagnostic significance; but no-one is going to base diagnosis on "the presence in the bone-marrow of any particular red-cell or white-cell precursor"; it is the *total change* in the marrow picture that is important—your leader perhaps does not make that sufficiently clear. I think this differentiation can be made with fair certainty after suitable training, and methods like those I have advocated are now in regular and successful use by several hospitals and practitioners in this area, among others. The normal range of variation in the differential cell-counts of sternal marrow material has been shown by all workers to be large; consequently only gross changes are significant and I think that it is still more useful for the clinician to know the main qualitative changes in the marrow than to be presented with a set of figures representing the proportion of "types" present—especially when these types don't reflect the point he chiefly wants information about.

How often is sternal puncture needed? The practice skins. It doesn't tell me why when I found that I had got scabies—not when I got them—the whole of my skin panicked and kept sending alarms from all sorts of unlikely places. One of my colleagues reacts in this way to the written word "scabies," and several others do when they see a grazing herd of *Pediculi capitis*. I once heard a boy say, "I rather enjoy chilblains, you get such a lovely feeling rubbing them." Now there is a problem my book didn't touch, a problem ranging from the original amœba's reaction to its first bath, the semi-hypnosis of cats and dogs by stroking, to the common human habit of stroking the chin to assist or quell thought. Then there was the man in the canon's stall at the service for ARP workers at the cathedral last Sunday, whom I watched detaching a small scab from his forehead. It must at last have fallen, for I saw him searching round and round for it on his surplice and the seat. We all got up and sang, but when we sat down again I saw that search still going on—a reasoned search, for it explored the desk where the scab might have fallen from the surplice when he stood up. We knelt down and again I saw that right hand restless, hunting hassock and cassock. I have seen my fox-terrier doing the same thing; he eats his when he finds it, but I can't say what the canon would have done if he'd found his. But why this very persistent search for so small amount of nutriment? My skin Baedeker has no information on the subject.

* * *

"I had no idea an operation was such a chatty affair." Thus the occupant of the room next the nursing-home theatre. And I suppose we surgeons and anæsthetists are rather prone to treat what may be a matter of life and death in a spirit of light-heartedness. Ogilvie put it well when he said that operating as a sport was a purely British conception. Understandable, no doubt, since we seem to go about our wars in the same fashion.

The other morning I suggested to my wife, who although a laywoman has witnessed several operations, that she should come to the theatre in ten minutes time to join us for 'levenses after my next case, which was a simple rib-resection for empyema under intravenous 'Pentothal.' The anæsthetist had hit the bull's-eye, and the knife was in my hand ready for the incision, when the patient coughed and went horribly blue, and creamy pus began to trickle from her nose. She had ruptured the empyema into a bronchus. Immediate passage of a hastily-produced bronchoscope, together with an extreme Trendelenburg tilt, allowed the pus to run out and give her an airway. House-surgeon, nurses and porters hung on to her legs, arms, and shoulders to keep her on the precipitous table, while a rapid rib-resection allowed the tension in the empyema to expend itself outwards instead of inwards. (Incidentally, she made an uninterrupted recovery.) At this stage my wife arrived for her coffee, and finding the surgeons' room empty peeped in through the door of the theatre. Her comment later was illuminating. "Whatever were you doing to that poor woman? I thought she must be pretty bad, because you were all looking as serious as we expect you to look when you're operating on us." It raised visions of operations seen at the pictures—chromium-plated theatre, discreetly draped body, male chorus of eager students and female ditto of nitwit blondes, the whole subservient to brilliant surgeon (preferably young and Adonoid, complete with headlight and stethoscope in situ, but without glamour-obscuring mask), and an all-pervading air of tenseness; for the knife to slip the hundredth part of an inch would mean death—admirable as a setting for bilateral pneumonectomy or decerebration, but how long could we work at that pitch? Major procedures (not forgetting that what is major to one surgeon is chicken-feed to another) of themselves evoke the requisite amount of concentration, but when an operation is so familiar as to become mechanical we just couldn't stay the course if we lived up to the Hollywood standard all the time. Hence the relaxation afforded by the tonsils and appendixes on the end of the big list, even though such minor operations must be performed with the care which is their due.

Imagine the feelings of the patient if he knew that his was to be the privilege of providing light relief for a tired surgeon! There is something in professional secrecy after all.

* * *

My old missus says you must cook a sauce for twenty minutes and that is where so many of them fail—they are not cooked long enough. We have to face the possibility next winter of living on the potatoes and the pulses that we grow this spring, and sauces are then going to be more important than they were. You can get on with potatoes so far as calories are concerned, and you can take vitamins in tablet form, but there is a third thing in diet and that is variety and flavour. This is where potatoes and pease pudding fail. One lot of flavourings comes from fruit, but with these you are dependent on sugar. Jam goes very well with potatoes, but we cannot get jam. The other comes from herbs with or without sauces. Boiled potatoes with a sauce that has so much parsley in it that it is quite green make an excellent meal. I do not want to have my dinner off this every day, but we may come to it. As an occasional one it is already on our menu; chopped chives makes another. Both these herbs grow well in London and if in London why not in a midland town. We had parsley sauce the day after the snow melted, and there is one thing about parsley that we learnt from Sutton's book. Never pull up a bit of "rogue" parsley, which means self-sown. It will be the best bit in the garden, waxing like the mustard-tree in the Gospel, which is a picture from the Jordan Valley. But sauces need something else beside the flour and the flavouring, and that is milk; and how are we going to spare that? To save dried milk in the summer won't do because it does not keep; and tinned milk is not over plentiful. Can anyone recommend a substitute for milk in a sauce? There is a bit of research for the housewife. In a high potato diet its first cousin the tomato should play a part; but again the question of keeping comes in. My old missus, being a nurse, had a shot at it. She boiled her jars and boiled the tomatoes and poured them straight in, and used boiling paste she had made herself without touching the paper. But one spore would get in and one spore is enough to cover the jar like a microbe in a petri dish if you leave it long enough. It will keep all right in the refrigerator; but even those who have one cannot fill it with six months' supply of tomato purée. She keeps an eye on it and boils it down again as soon as she sees a fungus beginning to grow. That takes a lot of labour and a lot of gas, but she is going to try again; and tomatoes also grow well in London. I know a couple who grew 160 lb against the north fence of a small garden. At that rate you can guzzle tomatoes while they last and still have quite a lot to keep at any rate through the first part of the winter.

* * *

"Half-past-six, sir." I rolled over in my camp bed and pulled my blankets more tightly over me, as I glared at the youngster who was my batman. On a box in the far end of the bare duty room was a basin of water. I slid out of bed and tried it; it was tepid again, but that really was not to be wondered at. There was no water or heating in the old house in which we were living, and the wretched batman had to carry the water from the nearest cookhouse; with snow lying thick on the ground it was not surprising that it had cooled in transit. Shaving was dismal, like my reflection in the mirror, and my reflections as I shaved. A week before I had been billeted comfortably in a colleague's house, and working hard at an adjacent hospital—a pleasant, busy appointment. Then one day came great news: authority had decided to recognise me as a specialist. Within a week I had left the hospital, and was installed as medical officer-cum-sanitary-inspector, remote from all hope of practising the art. My bitter reverie was interrupted suddenly as I caught another reflection in the mirror—that of my batman moving with coal-black hands to clean my tunic. "Get out," I shouted, "I'll clean it myself. And what's more I'll do my own boots." They say medicine is a good all-round training.

The address of the drugs branch of the Home Office is now Meyrick Cliffs Hotel, Beacon Road, Bournemouth. But applicants for import or export licences under the Dangerous Drugs Acts should be made to the finance branch at Trouville Hotel, Priory Road, Bournemouth.

f post-war reconstruction with the vision and courage hich they will demand We appreciate the difficulty accepting the word of the German government, but elieve that a scheme of controlled food relief similar to at proposed by Hoover in February, 1941 could be perated as successfully in this war as his similar scheme ndoubtedly was in the last war, in any case the mount of food in the country under the scheme at any iven time would not make any significant difference to he war if it were seized by Germany, an event which vould immediately result in the ending of the scheme Ve think that some such body as the International Red ross would be willing and able to operate such a scheme f the governments concerned were willing We realise hat shipping is a serious problem but think that this might be supplied by neutral countries, or if this were mpossible that it is our duty to liberate for their immedi- te and desperate need some of the merchant fleets which he occupied countries have put at our disposal Single hips sailing under the International Red Cross would ot need to be convoyed We are grateful for the relief ow being allowed to Greece, but are concerned that it hould be adequate and should be extended to the other tarving occupied countries of Europe

JEAN BELL, DONALD RAMAGE,
HELEN GURNEY, ELSIE WRIGHT
ENID HUGHES,

Newcastle on Tyne.

JAUNDICED CHILDREN

SIR,—During the last few weeks I have seen at least 10 children (aged 3–14) suffering from jaundice—pale stools, dark urine, yellow sclerotics and vomiting, &c The condition has cleared up readily within 10–14 days on a fat-free, plain diet *plus a bottle of rhubarb and soda* I think the cause is the excessive quantity of fats—dripping, lard, suet, &c —in the diet, minus fruit In view of the fact that the epidermis is more grateful for a constant soaping than is the gastro-intestinal mucosa, would it not be a good thing if the cooking-fats ration were halved and the soap ration doubled ? Or are these cases of simple dietetic jaundice, portents of some coming epidemic ?

Kearsley, Lancs D OCKMAN

HOSPITAL'S LIABILITY FOR NEGLIGENCE OF STAFF

SIR,—It would be unfortunate if the obiter dicta of Justice Tucker (*Lancet*, April 11, p 457) following ift J should encourage a contention that hospitals ght to be liable for the negligence of qualified technical sistants Incidentally it may be noted that the atten- n of the court does not seem to have been directed to analogous American case mentioned by Dr S W onaldson in "The Roentgenologist in Court" (p 56) e decision of the court in favour of the physicians ning the hospital is the more noticeable as the merican courts, while generally disposed to give judg- ent in favour of charitably maintained institutions, are t so kindly disposed towards those owned by private dividuals Actions in the English courts are only ought against the hospital authorities as they possess e means to pay substantial damages The sound ocedure from the point of view of administration as ell as of law is to make medical auxiliaries liable for eir own negligence If patients demand damages for ne slip after a number of careful treatments then technical ssistants, like medical men, will have to insure for their wn defence

Essex Street, W C 2 C E A BEDWELL

DOSAGE OF INSULIN

SIR,—I think it must be admitted that the avoidance f errors in dosage is a problem Owing to the variation n the strengths of insulin, there is much to be said for iscarding all syringes with unit markings and to use, s Dr Lawrence does, the 1 c cm syringe without other markings than those in cubic centimetres, and without ny minimum markings to complicate things Dr Behr's assumption that hospital patients can be made o understand decimal points is not always true, although very desirable We have therefore introduced at the Willesden General Hospital diabetic clinic rough-line drawings of the 1 c cm syringe, indicating the measurement of insulin by an arrow drawn in ink. Further, to make things as simple as possible, we favour keeping to one strength of insulin—namely, 40 units per c cm for most cases—but exceptions are recognised Unfortunately the present scarcity of syringes does not permit us to insist on a special type

Harley Street, W 1 S L SIMPSON

ZINC PEROXIDE

SIR,—Having recently had the privilege of meeting Dr. Meleney in New York, and seeing demonstrations of his technique, your leading article of April 4 on the use of zinc peroxide interests me very much There is grievous complacency in some quarters about what can and cannot be done for heavily infected wounds No-one will deny that modern chemotherapy has done much to control microbic infections, but this is hardly true once sepsis is firmly established in wounds and has become chronic Until such time as chemotherapeutic advance makes the control of chronic wound sepsis really practicable it is well to explore fully all other forms of treatment which show promise The efficacy of zinc peroxide has been doubted by some of those who have used it in septic wounds, but it appears that at least certain of this number have not followed accurately the technique as described by its originator or have used unsuitable zinc peroxide Dr Meleney kindly gave me a small supply of the peroxide he uses, and I should be pleased to send a few grammes to anyone requiring it for comparative chemical assays

London, N W 11 W R THROWER

STUDENTS' CALL-UP

SIR,—As a final student who has spent about six years on his medical studies and passed part of his final, I view with deep concern the decision of medical schools to dereserve all final students who fail in their examinations on two or more occasions (see *Lancet*, March 28, p 392) Such a decision implies that repeated failure in examinations means slackness and waste of time on the part of the students There is no denying that some students are slackers Such students should in any circumstances be weeded out both in the interests of the profession and the interests of the national effort But there are many capable students who, though working very hard and achieving a good standard of practical knowledge, yet fail in examinations because of their psychological make-up To dereserve such men would be a loss of valuable material to the profession, and a loss of valuable time to the students themselves It would surely be wiser to grant them junior appointments in EMS hospitals, thus enabling them to continue with their studies, to render service to the community for which they are already equipped, and to release qualified doctors for the forces Such appointments should of course be on the recommendation of deans or teachers

SIXTH YEAR MEDICAL STUDENT

"RAT VIRUS"

SIR,—In his interesting article in your issue of Jan 31 (p 158) on the control of rats, Mr Hardy comments rather unfavourably on the use of "rat virus" because rats are liable to become immune to it and also because certain cases of enteritis have been attributed to the bacterium employed in such viruses Few real attempts appear to have been made to check up in the matter Rat-virus bacteria belong to the salmonella group and outbreaks of disease attributed to the virus mostly seem to have occurred before this group was properly classified Rat viruses have been sold on the open market for years and are employed on a large scale by rodent-destruction companies throughout the world If the risk due to their use is appreciable it is remarkable that more outbreaks of disease caused by them have not been reported, and it is still more remarkable that no case of disease has so far been recorded among the staff of the laboratories where the cultures are prepared Any suspected infection should be investigated, the bacteria isolated from the patient being compared with the original cultures both by agglutination and fermentation tests and by animal experiments Due weight should be given to the fact that rats are notorious carriers of salmonella and other infections and that among the organisms which they carry in nature is the one used as an antidote against them Rats also harbour the of this department may be helpful As in most clinics, the majority of the patients are dealt with as outpatients, the minority as inpatients, sternal puncture is done rarely on the former, commonly on the latter The indications are any doubt about the diagnosis such as history of failure of liver treatment, unusual age, or exceptional clinical signs or symptoms, grave anæmia with an equivocal blood-picture, and finally any case the subject of current research about whom the fullest information is desirable

To treat a patient with liver extract before getting a blood count is certainly indefensible, but reliance on the halometer—or any other method of measuring red-cell size—has also led to mistakes because, as has been often shown in the literature, increased red-cell size may occur in other conditions than pernicious anæmia If clinical findings and blood-count are not diagnostic the investigations to be made are, in order of importance, sternal puncture, fractional gastric analysis, examination of the serum for bilirubin and methæmalbumin Dr Murray properly regards reticulocytosis after a dose of liver extract as important confirmation of pernicious anæmia, but this takes time and sternal puncture will save possibly vital days

Diagnosis in hæmatology, as in other branches of medicine, depends on the consideration of the whole picture presented by all the information available, the results of sternal puncture are an important part of this picture, but must always be judged in relation to the rest of the clinico-pathological combination In my work I have been in the fortunate position of being both physician and pathologist In hæmatology this seems to be a useful combination, I see no reason why the physician should not be encouraged to use his microscope as he did in Osler's day, and surely a physician ought to know what tests to apply in a given case and also to have a fair idea of the possible results, it is in the difficult cases that the clinical pathologist's extra knowledge will be needed

Manchester Royal Infirmary M C G ISRAELS

MIGRAINE RELIEVED WITH A HORMONE

SIR,—A case in which attacks of migraine were brought on by administration of œstrin suggested to me the possibility that migraine might be relieved by a counteracting hormone A woman of 25, who had suffered from periodical attacks of migraine severe enough to keep her in bed, sought treatment for an obscure vaginal discharge which was apparently glandular in origin She was given stilbœstrol, a tablet of 1 0 mg t d s by mouth, and after the third tablet she was violently sick and had a typical attack of migraine When the natural hormone was substituted the result was the same An intramuscular injection of œstradiol benzoate, 10,000 units, was then tried, and this was followed by an attack of migraine within three hours She was then given anterior pituitary-like hormone in the form of 'Antuitrin S' (PDCo) in increasing doses for two weeks and has since remained free from attacks If then, I argued, migraine can be induced, in certain cases at least, by excess of œstrin or some similar substance, it is reasonable to expect benefit from treatment with a hormone, obtained from pregnancy urine, with luteinising properties Accordingly over a period of fourteen months I have given antuitrin-S by subcutaneous injection to a series of 20 unselected cases of migraine of whom 15 have lost their headaches and other symptoms entirely and in the remainder the interval between attacks has been prolonged and the attack shortened I begin with 75 rat units, followed by 100, 150 and 200 units at intervals of 4–6 days Then 200 to 300 units once or twice weekly for two weeks depending on the severity of the case After this 250 units weekly for one month, continuing with 250 or 300 units monthly for two months These doses can be increased without danger if an attack is severe, but care should be taken not to give an injection within 3 days of the expected date of the menstrual period In most cases such a course is sufficient, but severe cases may require a continuation of treatment with 300 units, at least once a fortnight, to keep up improvement, or 500 to 600 units on alternate days for a week if attacks are brought on by a toxic condition such as influenza In some of the cases there was no apparent relation between the migrainous attacks and the menses Only one case of migraine in a male has been treated, but this also yielded to a series of injections of antuitrin S

Little is known about the exact composition of the APL hormone which has to be distinguished from the gonadotropic hormone said to be present in the urine of some migrainous patients before and during an attack [1] That APL hormone acts through the pituitary and not directly on the gonads is shown by the fact that no effect is produced in the experimental animal if the pituitary is first extirpated Chemically, also, it has been shown that while cysteine completely inactivates the pituitary gonadotropic hormone it has no effect on the APL hormone [2] The treatment of migraine with this hormone does not appear to have been reported in this country though Moffat, in Canada, has described 11 cases of menstrual migraine treated with 'Follutein' (Squibb) Using much smaller doses he nevertheless reported good results [3]

London, W 1 NEVIL LEYTON

RCS COUNCIL ELECTION

SIR,—We desire to draw the attention of all who have the best interests of the Royal College of Surgeons at heart to the forthcoming election to its council The average age of the present council is over 62 years and three of its members are septuagenarians The college is particularly fortunate in having at this time a president equipped at all points to guide it and shape its future destiny but we believe the council need younger surgeons to help in framing its policy today

A fellow is elected for a first term of eight years and it is the accepted custom for him to serve a second, making sixteen years in all Of recent years there has been an increasing tendency for councillors to seek a third term, and it is the harmful effects of this practice we wish to bring to your notice This leads to an inevitable increase in the number of members of seventy years or over, and delays the successful candidature of men of the right type and age, so that they either abandon their hopes or apply when they are too old In this present election two councillors offer themselves for re-election for a third term, both of whom personally we regard with respect and affection, while other candidates are already of such an age that the end of their first term will bring them near to the 65-year standard

The future is unknown but enough can be seen of the trend of affairs to leave us in no doubt that our profession must face problems of great complexity in reorganising the whole structure of our professional life and in regulating our relationship with the state It seems both just and logical that those who will have to live and work in this new world should help to fashion it For this reason we believe that the council is in urgent need of younger men of established professional reputation and known administrative experience

We hope that in recording their votes fellows have already had in mind these points we have raised, and that those who have not yet voted will not fail to do so after giving careful consideration to what we believe to be the best interests of the college If in the future it influence wanes and its counsels are no longer heard in the land, it will be useless for us—the voters of today—to lament, for we shall have had our chance and thrown it away

ERIC A CROOK,	J B HUNTER
W D DOHERTY,	G T MULLALLY,
R M HANDFIELD-JONES,	GEORGE E NELIGAN,
RUPERT VAUGHAN HUDSON,	VICTOR RIDDELL,
J BASIL HUME,	W H C ROMANIS,

Fellows of the College

RELIEF OF FAMINE

SIR,—We view with deep concern the state of famine existing in most of the German-occupied countries We realise the great difficulties in the way of relief but feel that every effort should be made to find a way, as victory will be robbed of much of its value if thousands of our conquered allies starve before it is achieved, and as a generation which has been warped in body and mind by starvation cannot be fit to meet the immense problem

---

[1] Riley, H A, Brickner, R M, and Kurzrok, R *Bull neurol Ins N Y* 1933, 3, 53

[2] Fraenkel Conrat, H L, Simpson, M L and Evans, H M *J biol Chem* 1939, 130 243

[3] Moffat, W M *J Amer med Ass* 1937, 108 612

Prof A T Jurasz writes "When the Polish Medical hool was founded in Edinburgh in March, 1941, I had no sitation in calling on Stocki to lecture in pathological stology for I knew his record in Poznan He has done eful work for us and his death has left a gap which will be fficult to fill Dr. Stocki died far from his own country, id it was not given to him to see the liberation of our untry But the scattering of Polish earth into his ave testifie that he rests in Polish soil, for which he ve up his home and his family and sacrificed every- ing"

Medical News

oval College of Surgeons of England

At a meeting of the council of this college held on April 9, ith Sir Alfred Webb-Johnson, the president, in the chair, e Jacksonian prize for 1941 was awarded to Mr W Bremner ighet for his essay on injuries to peripheral nerves, with pecial reference to the late after results The subject for e prize for 1943 will be the treatment of acute intestinal struction The John Tomes prize for 1939–41 was awarded Dr R V Bradlaw, L D S, for his researches into the icroscopical structure of the dental tissue

Dr N G Horner, editor of the *British Medical Journal*, nd Group Capt P C Livingston, consultant in ophthalmo- gy to the R.A.F were elected fellows under the charter hich permits the council to elect annually to the fellowship, ithout examination, two members of twenty years' standing

Mr H S Souttar was re-elected a member of the court of xaminers for a year Mr Eardley Holland was reappointed presentative of the college on the Central Midwives Board

A diploma of fellowship was granted to P F J Hickin otham (Birm and Lond) and diplomas in child health were ranted jointly with the Royal College of Physicians to the ollowing —

Irene M Bower J L Emery Monica M M M Fisher Margaret Graveson Eleanor J Herrin Mary C Hopper A M Lester earl Lyons Zina E Moncrieff Arna E Rides L M Shorvon eanor M Singer T H E Taylor Jones Celia K Westropp and ermann Wolfsohn

niversity of London

The following have been recognised as teachers of the university in respect of the posts mentioned —

Dr H W Breese, L D S teacher of dental surgery at Middlesex ospital medical school Dr Noel Harris teacher of mental diseases t Middlesex Hospital medical school Dr H L Marriott eacher of medicine at Middlesex Hospital medical school, Dr A L. ackham L D S teacher of dental surgery at Middlesex Hospital edical school Dr Eliot Slater, teacher of mental diseases at the audsley Hospital

niversity of Dublin

At recent examinations at the school of physic, Trinity ollege, the following were successful —

FINAL EXAMINATION FOR M.B, B CH., B A O

Medicine—Cecilia J Dippenaar and J W Dignan (second-class honours) A. M Russell K. J Swanepoel Andrew Aitken Brenda R. Boydell A. M Jacobson S D Killen M G Jackson-Smyth Lavinia F Nightingale J W van der Roos and P J Mentz

Surgery—Cecilia J Dippenaar and Franziska G Brill (second-class honours Florella Starritt Gladys M Byers D M. Brooks M. B Flanagan K. J Swanepoel C W Lloyd G F Shaw R C Pylance T J N Bates S B Stein T A H Black Muriel Eakins and A G Lee

Midwifery—F S Stewart W J C Hill and A V Poots (first-class honours) G A M Lee Heinz Scheyer R B Brenan Hannah E Hinchcliff J M T Adamson E K Holland P St G Anderson J J Musgrave Violet K St G Breakey Mary D Moriarty A W Pringle K. M Shaw K. H Anderson Samuel Potgieter G R Connolly and W B Martin (second-class honours), L T H Mills F M. Lanigan O Keeffe Helen L Croasdaile C K. Elliott J B FitzSimons N L Smith, D K Walshe Catherine E Craig Dorothy W M Last P H Seaton J D O Neil Donnellon Joseph McNutt O D Nightingale R H C Conyngham H H B Lamb Margaret E McClelland J M Hanrahan W J W Wolfe and M T S Conradie

Society for Relief of Widows and Orphans of Medical Men

At a quarterly court of directors held on April 8, the president, Mr V Warren Low, being in the chair the accounts for the year 1941 were approved Of the two widows reported deceased one had been receiving grants for 32 years £2 400 in all (member had paid in subscriptions £39 18*s*) the other had been receiving grants for 23 years, £1,770 in all (member had paid £52 10*s*) Membership is open to any registered medical man, who at the time of his election is residing within a twenty-mile radius of Charing Cross Particulars from the secretary, 11, Chandos Street, London, W 1.

THE Central Midwives' Board have re-elected SIR COMYNS BERKELEY as chairman for 1942–43

Czech Medical

At special final examinations for the Czechoslovak MUDr degrees held at the request of the Czechoslovak minister of the interior and education in London by the examining board in England of the Royal Colleges of Physicians and Surgeons the following were successful —

Part I (pathology and bacteriology)—Frantisek Adler Judita Fejerova Imrich Gluck, Hugo Keszler, Alfred Kozdon Zoltan Leffkovits K A Machacek, Pavel Merory Hanus Neuner W M Politzer Oldrich Prec Lotar Sik P J Sonnek, Vilem Taussig, Zdenek Urbanek and Otto Weiss

Part II (medicine)—Jan Glaser Jan Kudrna Josefina Liebsteinova Velimir Macharacek M K Martischnig Charles Novak Vladimir Pekarek, Pavel Retter, K J Susat, Walter Tausig, and Josef Voracek

Harveian Society of London

Colonel L E H Whitby will deliver the Harveian lecture to this society at 11, Chandos Street London W 1, on Monday, May 4, at 4 P M. He will speak on the hazards of transfusion

Medical Society for the Study of Venereal Diseases

A meeting of this society will be held at 2 P M on April 25, at 11, Chandos Street, London, W 1, when Major S M Laird will open a discussion on the need for further powers to deal with sources of infection, contacts and defaulters

Imperial Cancer Research Fund

The annual general meeting will be held at the Royal College of Surgeons, Lincoln s Inn Fields, London, W C 2, on April 22, at 2 30 P M.

Royal Sanitary Institute

A meeting of the institute will be held at Bradford on May 1 and 2 when Dr John Gibson, medical officer of health for Huddersfield, will open a discussion on the regionalisation of hospitals On May 9 the institute will meet at Newcastle-on Tyne, when Dr Ian McCracken will speak on administrative and practical problems raised by the scabies order.

Imperial Chemical (Pharmaceuticals) Ltd

A private limited company has been formed under this name as a subsidiary of Imperial Chemical Industries Ltd The research work of ICI (Dyestuffs) Ltd in the higher organic chemical field has for some years included the closely related branch of chemical therapeutics and several important products, including some previously only obtainable from foreign sources, are already on the market The new company is the outcome of these developments

Medical Casualties

In recent casualty lists Captain G R Royston, M D Lond., R.A M C, was posted as wounded and Lieutenant John McSorley, M.B N U I, R.A M C, as prisoner of war

Since the fall of Singapore the following R A M C officers have been reported missing Colonel C F Burton M R C S, Major G A Gauld M R C S, Captain J G Jesson, M.B Lond and Captain E D H Williams, M B Lond

Medical Planning at Sheffield

The first meeting of a discussion group which has been formed by the assistants and residents of Sheffield hospitals was held on April 7 at the Royal Hospital Dr A E Barnes, who was in the chair, introduced a discussion on the future of British hospitals Dr E G G Rhind read a paper on regionalisation, which was followed by a general discussion The secretary explained that the group has been formed to provide the more recently qualified medical men and women in Sheffield with an opportunity of expressing their views on medical reorganisation

Conference on the Health of the Worker

The Labour Research Department in coöperation with the Socialist Medical Association are holding a conference at the Conway Hall, Red Lion Square London, W C 1, on Saturday, May 16, at 2 30 P M, under the chairmanship of Mr Jack Tanner, president of the Amalgamated Engineering Union Dr T O Garland will open a discussion on the health of the war worker in which speakers from various industries will afterwards take part Further information may be had from the secretary of the department 6, High Holborn, W C 1

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export

fleas which may carry typhus and other diseases If these rodents can be largely controlled by the use of an organism, which has yet to be proved to cause infection to human beings, is it in the country's interest to suppress its use and to risk the increase of other and more serious infections?

London, W C 1 THOMAS McLACHLAN

The Editor of the *Medical Journal of Australia* writes to say that as the result of enemy action copies of the *Lancet* for Jan 4, March 15 and Aug 16, 1941, have not reached him These issues are now out of print and we should be glad to hear from any reader who has spare copies for these dates and would be willing to help us to complete the Australian journal's file

Obituary

GEORGE McNEILL

M B EDIN , F R C S E

Dr George McNeill who died on April 1, the day after his 64th birthday, graduated from Edinburgh University in 1902 Before joining the medical staff of Morningside Mental Hospital he voyaged to South America He served under Clouston for three years till his interest in surgery led him to become assistant to the professor of anatomy at St Andrews In 1908 he took his F R C S E with anatomy as special subject, and the following year he went as surgeon to the Rio Tinto mines in Spain where he had a considerable experience of major surgery He returned in 1912 and after a short period in general practice he was about to confine himself to surgery as a consultant when war broke out McNeill served in France as surgeon in charge of a hospital in Etaples, and reached the rank of major before he was invalided as the result of an abdominal injury and appointed surgeon to Lord Derby Memorial Hospital at Winwick, Lancs In 1920 he joined the staff of the Ministry of Pensions, first having charge of surgical cases at Orpington and later at Sidcup In 1928 he became medical superintendent to the Ministry's hospital at Dunston Hill near Newcastle-on-Tyne where he continued to serve until his death

Dr McNeill created an atmosphere of dignity, kindliness and justice which was appreciated by his staff and patients The hospital and his family occupied all his thoughts and energies He treated his resident medical officers like sons, setting them a high standard of professional conduct, stimulating their postgraduate studies and following their professional and family careers with fatherly interest His courtesy and quiet humour endeared him to his senior colleagues, and in these last months of failing health his fortitude and cheerfulness were never failing Dr McNeill leaves a widow with three sons of whom the two younger are studying medicine

DAVID HENRIQUES de SOUZA

M D , D SC LOND , F R C P

MANY doctors will remember Dr de Souza, who died on March 25, for not only was he physician to the Westminster Hospital but he was also for many years lecturer in physiology at King's College where students from St George's, Charing Cross and KCH attended his classes Born into a Portuguese family which had lived for many generations in this country at Portsea and in the City of London, de Souza was educated at York Castle School, Jamaica, and University College, London He graduated B Sc, with first-class honours in physiology, in 1899, and qualified in medicine four years later Appointed to a lectureship in physiology at Sheffield he returned to London to take up his post at King's where he soon realised that his main interest lay in clinical medicine, and he secured higher medical qualifications to join the staff of the Westminster first as registrar and later as a physician to the hospital and a teacher at the medical school, of which he was at one time dean His appointment at King's allowed him to take a detached interest in consultant practice and the hospital and its patients and students became his hobby He was outstanding as a teacher in the wards, for his experience as an examiner both in medicine and physiology for the Conjoint Board and the Universities of London and Liverpool had persuaded him that students were not sufficiently trained to rely on their own observation, judgment and knowledge He himself proudly claimed to be a consultant general physician and he deplored increasing tendency to overspecialisation He held a physician should have enough clinical acumen courage to make his diagnosis after examining a patient and to use pathological reports and X rays only as confirmation or refutation of his opinion

In 1928 Dr de Souza felt he could no longer com his duties at King's and the Westminster and he gave his lectureship in physiology but not his interest in the subject At the time of his death he was busy with research on the administration of oxygen at St Thomas's and was about to begin work in a laboratory at the Westminster which had been equipped for him by the ladies committee He was a barrister-at-law of the Middle Temple and of recent years had found much interest and amusement in his legal cases

De Souza's quiet and somewhat formal manner hid genuine kindness Nurses who were ill naturally gravitated to beds in his wards, and former students were apt to ask him to attend themselves and their own families in illness He was a strong supporter of the higher education of women and of co education in medicine A fine musician, he had been an accomplished pianist He had no interest in large gatherings of casual acquaintances and was happiest at work in the wards and his laboratory or at home where he and his wife kept open house for their friends, many of whom were former students One of these crystallises his epitaph thus he was a remarkable man with the heart of a child

ROBERT BROWN CAMPBELL

M D EDIN , F R C P E

Dr R B Campbell, who died at his home in Edinburgh on March 26, was for more than a quarter of a century medical superintendent of the Stirling District mental hospital at Larbert He graduated in Edinburgh in 1895 and after serving as senior assistant at the Crichton Royal and the Montrose he was appointed to the Inverness District mental hospital in 1904 He was transferred to Larbert in 1908 and in 1912 took his M D and was elected to the Edinburgh fellowship When the hospital was taken over by the Admiralty in 1917 Dr Campbell was appointed consultant physician to the Royal Navy for nervous and mental diseases with the temporary rank of surgeon commander In 1932 he became president of the Royal Medico-Psychological Association, which he had already served well as secretary of the Scottish division He was also secretary and later chairman of the Scottish asylums pathological scheme and soon after he retired from Larbert in 1934 he joined the board of managers of the Edinburgh Royal Infirmary Dr Campbell always took a keen interest in the Royal College of Physicians of Edinburgh and for some years before his death was a member of the council His wife died about three months ago and he leaves one daughter and three sons

WACLAW STOCKI

M D POZNAN

Dr Stocki, who died in Edinburgh on March 17 at the age of 40, was born in Waligrod, in Southern Poland He studied medicine in the medical school at Poznan, and after he took his M D in 1928 he worked in the pathological department of the university as junior assistant and later as lecturer and senior assistant to the professor After five years he had to give up this congenial appointment and start in general practice in Poznan But he always remained in close contact with the pathological institute His patients appreciated his sympathetic and human approach, and he represented the younger generation of doctors on the governing body of the medical association

During the Polish campaign of 1939 Stocki was attached to a military hospital Afterwards he went to Warsaw where he saw so much German cruelty and barbarity that he decided to escape and join the Polish Army in France In January, 1940 he parted from his wife and mother and during the severe winter made his way through the ice and snow-covered Carpathian mountains to Hungary where he was interned But he escaped and reached France where he joined the Polish Army and with this army he came to Britain

EPILEPSY FOLLOWING APPLICATION OF SULPHATHIAZOLE NEAR THE BRAIN

A. C WATT, M.B EDIN G L ALEXANDER, F R C S

(Brain Injuries Unit, Edinburgh, and Wilkie Surgical Research Laboratory, University of Edinburgh)

THE purpose of this paper is to draw attention to the danger of applying sulphathiazole in proximity to the brain, particularly in the frontal region The local application of the sulphonamides in actually or potentially contaminated wounds has recently acquired some popularity The bone-flap in many craniotomy operations is necessarily largely deprived of blood-supply and may be regarded virtually as a free auto-graft, so that even aerial contamination may become important in such operations Accordingly the local use of chemotherapeutic agents as a prophylactic against possible infection in primary operations has been adopted in many neurosurgical centres

When sulphathiazole became available we applied it in the same manner as had been our practice with sulphapyridine Two to three grammes of the powdered drug, sterilised in the autoclave, was insufflated into the wound after closure of the dura mater, both deep and superficial to the bone-flap The closure of the dura mater was, as usual never complete enough to prevent cerebrospinal fluid from percolating through and thus gaining direct contact with the sulphathiazole powder All went well with the first two cases, then we began to have postoperative complications intermittently, in the form of epileptic seizures in quick succession, beginning about two hours after operation There were 2 deaths in the 5 cases exhibiting this train of symptoms

CASE-RECORDS

The following brief case-records are given chronologically, cases 3 and 7–10 were complicated by epilepsy

CASE 1 —Man, aged 44 Lateral bone flap craniotomy for removal of postfrontal meningioma, 3 g sulphathiazole No postoperative epileptic symptoms

CASE 2 —Man, aged 30 Four years' history of focal epilepsy due to left parietal meningioma Lateral bone flap, tumour removed, 3 g sulphathiazole No postoperative complications *in spite of history of epilepsy*

CASE 3 —Man, aged 35 Pituitary adenoma Left frontal intradural approach, intracapsular removal Multiple punctures made in arachnoid to drain large fluid lakes in sulci and facilitate retraction of brain, 3 g sulphathiazole applied as described above An hour after return from theatre there were three fits in quick succession, generalised but more severe on right side Chloroform inhalation and intramuscular phenobarbitone soluble given, 10 min. after cessation of chloroform there were four fits within 15 min. Spinal puncture low pressure, slightly blood stained fluid (not examined for sulphathiazole concentration) Fits continued throughout the night at intervals of 2–30 min in spite of a total of gr 10 phenobarbitone soluble and rectal paraldehyde About 150 fits recorded in first 20 hours, after which they ceased No hyperthermia and respirations 24–30 between attacks Gradual improvement, but return of consciousness very incomplete Spinal puncture, 24 hours after onset 100 mm pressure, fluid as before On third day condition was slowly deteriorating, not improved by 'Icoral' or intravenous sucrose, gaseous distension of abdomen Shortly before death on fourth day two pints of bright red blood was vomited

At autopsy the tumour in the region of the sella turcica was found to be very large and extending into adjacent structures The brain showed some generalised flattening of cerebral gyri and a deep impression due to pressure by the tumour in the region of the interpeduncular fossa Nothing unusual was noted in the vicinity of the operation wound, and there was no obvious source of the blood vomited before death A small amount of sulphathiazole was still discernible extradurally

CASE 4 —Man, aged 22 years Hand grenade accident, compound fracture in frontal region. Localised craniectomy *without opening of dura* some weeks after accident about 2 5 g sulphathiazole No epileptic disturbance

CASE 5 —Man, aged 37 Parieto occipital bone-flap craniotomy for removal of tumour at inferolateral border of occipital lobe, 3 g sulphathiazole Convalescence uneventful

CASE 6 —Woman, aged 46 Left parietal bone flap craniotomy for exposure of parasagittal meningioma, tumour not removed, arachnoid not extensively opened, dura not closed, 2–3 g sulphathiazole Subsequent X ray therapy Convalescence uneventful

CASE 7 —Man, aged 25 Left frontal intradural approach for suprasellar pituitary epidermoid, tumour removed Ventricle tapped through dura early in exposure; 3 g sulphathiazole applied during closure Six generalised epileptic attacks from second to twelfth hour after operation, no further symptoms Very incomplete recovery of consciousness until attacks ceased

No family or personal history of epilepsy in this case

CASE 8 —Woman, aged 48 Orbital neurofibroma, right frontal craniotomy and removal of roof of orbit *Dura merely punctured* to permit tapping of anterior horn of ventricle in order to facilitate exposure, 0 5 g sulphathiazole inserted deeply in operation field and 0 5 g sulphapyridine placed superficial to bone flap Immediate postoperative recovery normal Six hours after operation, five generalised epileptic attacks with unconsciousness, duration 1–2 min each Fits readily controlled by chloroform inhalation and phenobarbitone soluble Subsequent progress uneventful

CASE 9 —Woman, aged 25 Extensive right frontal lobectomy for tumour, dura sutured, 2 5 g sulphathiazole applied only to outer aspect of bone flap Seven focal epileptic attacks of one minute's duration, 1½–6 hours after operation Left side of face and neck involved, no generalisation No further epileptic symptoms thereafter, but recovery of consciousness was delayed until after the epileptic phase

CASE 10 —Woman, aged 67 Right frontal approach to pituitary tumour, intracapsular removal, sulphathiazole 2–3 g applied after closure of dura Remained unconscious, 2 hours after operation epileptic attack began on left side of body and then became generalised, duration 1½ min Phenobarbitone soluble gr 3 intramuscularly, in spite of which five similar attacks observed in next 40 min Chloroform inhalation for 20 min and 3 min thereafter attacks recurred with increasing frequency until the interval between each was less than 3 min, duration 1½ min Chloroform inhalation repeated four times during the night for periods from 25 to 90 min., giving only very temporary relief from attacks After each inhalation the first few fits were milder and confined to the left side of the face but soon regained their former characteristics, always beginning on the left side of the body During the second day the fits became fewer and ceased at 7 P.M Thus in the first two days the patient had over 200 fits all similar in character, she had not recovered consciousness On the third day she improved sufficiently to be able to make some response to stimuli and questions, and began to swallow fluids Spinal puncture 200 mm pressure, slightly blood stained fluid By this time signs of congestive heart-failure were becoming evident, consequent on the exhaustion occasioned by the epilepsy She died on the fourth day after operation Autopsy not permitted

Chemical assay of total sulphathiazole (combined and free, method of Marshall and Litchfield) in the lumbar field 48 hours after operation gave the finding of 8 9 mg per 100 c cm, and in fluid aspirated from under the scalp flap the significantly high figure of 13 8 mg per 100 c cm Spinal fluid immediately after death contained 14 8 mg of the compound per 100 c cm

COMMENT

In this series of 10 craniotomies in which sulphathiazole was used, 5 of the 6 frontal explorations were complicated by postoperative epilepsy Death resulted from status epilepticus in two of these cases, both of which were explorations for pituitary tumour In the remaining frontal operation not complicated by epilepsy the thickened dura was not opened, this is significant. None of the affected patients had either a personal or family history of epilepsy It is further to be noted that *in the four cases* of lateral or posterior craniotomy epilepsy did not occur, *not even in case 2 with a history of previous epilepsy* Case 8 (orbital tumour) is of particular interest in that the dura and ventricle were merely punctured, and in this instance initial recovery of consciousness was average and the onset of fits was delayed until six hours after operation, moreover the

Notes, Comments and Abstracts

STUDENTS' BOARD AND LODGING

Up to now the Ministry of Health has not contributed to the cost of billeting, boarding or lodging students except in special circumstances when, for instance, they have been needed to help in the reception of casualties. The minister has now decided to pay for the board and lodging of a fixed quota of resident students, allocated by agreement between the hospital authorities and the group officer, for each hospital within the emergency scheme found to require them The object will be to ensure a small nucleus of resident students who will be available to help in special transfusion and resuscitation teams, to act as stretcher-bearers, porters or otherwise in the reception and treatment of casualties, or, in the case of senior students, to act as house-officers where ordinary house posts have been abolished For short periods of exceptional pressure this quota may be expanded, but students may only be included if they have been helping in the reception or treatment of casualties "materially and necessarily during the whole period for which the costs are claimed" Fire-watching and ARP duties will not count as helping for this purpose The ministry will contribute up to £100 a year towards the board and lodging of any senior student acting as junior house-officer

A DIETETIC READY RECKONER

The research laboratories of Vitamins Ltd have issued a food value calculator[1] which magnificently simplifies the work of evaluating family and institutional diets in terms of calories, proteins, inorganic elements and vitamins Like a planisphere, it consists of two concentric cards, the smaller pivoting on the larger The position of the smaller is adjusted so that the amount of a particular food eaten appears in a slit in the upper card and immediately beneath appear figures for protein, calcium, available iron, vitamins A, B_1, C and calories in that amount Thus if I eat 4 oz sprats I can read off at a glance that I have consumed 20 g of protein, 720 mg of calcium, 3 mg of iron, 112 I U vitamin A, 20 I U vitamin B_1, no vitamin C, and material to yield 100 calories The calculator is designed mainly for large-scale dietary surveys and would give less accurate results in calculating a diet for a solitary bachelor The laboratory worker, of course, will shy at the thing, for naturally it cannot take account of the minutiæ with which he is accustomed to deal, but it should be in the hands of every dietitian and in every kitchen where people are beginning to think in terms of food values, and those with old-fashioned families should find it a useful piece of domestic apparatus

MICROSCOPES FOR RUSSIAN VETS —Sir Robert Gower, chairman of the RSPCA, writes that a hundred microscopes are needed by the Soviet Army Veterinary Corps for the treatment of horses suffering from disease as a result of the strenuous campaign He asks that anyone who has an unwanted microscope should present it to the RSPCA for transmission to Russia The appeal has the approval of the British Ministry of Supply The address of the RSPCA is 105 Jermyn Street, London, S W 1

ROYAL SOCIETY OF MEDICINE —The section of therapeutics and pharmacology of this society will meet on Tuesday, April 21, at 2 30 P M, when Dr J C Bridge, Sir David Munro, Dr Catherine Swanston, Dr R E Lane and Prof T B Davie will open a discussion on TNT poisoning The general meeting of fellows will take place at 5 P M on the same day On April 23, Mr Geoffrey Parker will read a paper to the section of urology on hæmospermia Miss M E Flambert, deputy chief nursing officer of the Ministry of Health, will open a discussion on the future of public health nursing at the section of epidemiology and state medicine on April 24, at 2 30 P M Other speakers will include Miss E C Phillips (America), Miss I Hawkins (New Zealand), Miss Eleanor Jones (Canada) and Dr Nicholas Gebbie, medical officer of health for Hull The section for disease in children is holding a meeting at the children's unit of Windsor Emergency Hospital on April 25, at 2 30 P M

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED MARCH 28

Notifications —The following cases of infectious disease were notified during the week smallpox, 0, scarlet fever, 1307, whooping-cough, 1504, diphtheria, 891, paratyphoid, 5; typhoid, 9; measles (excluding rubella), 3188, pneumonia (primary or influenzal), 1258, puerperal pyrexia, 181, cerebrospinal fever, 105, poliomyelitis, 5, polio-encephalitis, 3, encephalitis lethargica, 6, dysentery, 125, ophthalmia neonatorum, 105 No case of cholera, plague or typhus fever was notified during the week

The number of civilian and service sick in the Infectious Hospitals of the London County Council on March 25 was 1446, including scarlet fever, 133, diphtheria, 187, measles, 101, whooping-cough, 462, enteritis, 82, chicken pox, 50, erysipelas, 41, mumps, 10, poliomyelitis, 1, dysentery, 25, cerebrospinal fever, 39, puerperal sepsis, 24, enteric fevers, 7, german measles, 5, malaria, 8, other diseases (non infectious), 114, not yet diagnosed, 9

Deaths —In 126 great towns there were no deaths from scarlet fever, 3 (0) from enteric fevers, 4 (1) from measles, 10 (2) from whooping-cough, 23 (0) from diphtheria, 34 (5) from diarrhœa and enteritis under 2 years, and 42 (5) from influenza The figures in parentheses are those for London itself

Liverpool, Exeter and Cardiff each reported 1 death from an enteric fever, and there was also 1 fatal case in Greater London. Middlesbrough had 3 deaths from diphtheria

The number of stillbirths notified during the week was 251 (corresponding to a rate of 38 per thousand total births), including 31 in London

Appointments

DODD WILLIAM, M D LPOOL, M R C P deputy M O H and school M O for the Isle of Ely

FRIEDMANN, ERNEST, M D BERLIN, L R C P E obstetric and gynæcological registrar at the Royal Free Hospital

HAMILI MARY, M B N U I R M O at the maternity and child welfare department of the Babies' Hospital, Canwell Hall Birmingham

PRICEE, L W, M D CAMB director of the pathological department at the Royal Cancer Hospital (Free), London

RICHARDSON, F C RUTH L R C P R M O at Three Counties Hospital, Arlesey, Beds

TITLER, JESSIE, M B GLASG, D P H temp deputy M O H for Chester

WALKER, J Z, M B GLASG, D M R E, F F R director of radiotherapy for Lincolnshire

The following have been appointed medical referees for cases of dermatitis under the Workmen's Compensation Act —

HALDIN-DAVIS, H D, D M OXFD, F R C P, F R C S, for circuits 45, 47–50 and 56,

MACCORMAC, HENRY, M D EDIN, F R C P, for circuits 27, 34, 35 37–50, 56 and 58, and

SEMON, H C, D M OXFD, F R C P, for circuits 27, 34, 35, 37–44 46 and 58

Births, Marriages and Deaths

BIRTHS

BROOKE —On April 5, in London, the wife of Dr Bryan Brooke—a daughter

CHITNIS —On April 4, in Birmingham, the wife of Dr C N Chitnis of Castle Bromwich—a son

DRAKE LEE —On April 7, at Kettering the wife of Dr W Drake Lee—a son

FAIRBAIRN —On April 8, the wife of Captain A S Fairbairn R A M C —a son

FERGUSSON —On April 11, at Edgware, the wife of Mr J D Fergusson, F R C S —a son

MILLER —On April 12, at Newcastle on Tyne, to Dr Sheila Miller (*née* Franklin), the wife of Dr Frederick Miller—a son

PORTER —On April 10, at Watford, the wife of Captain D Paterson Porter R A M C —a son

PRIDIE —On April 5, to Dr Joanna Pridie (*née* Egerton), wife of Mr Kenneth Pridie F R C S of Bristol—a son

VICKERS —On April 8, the wife of Surgeon Lieut Commander H R Vickers, R N V R of Sheffield—a daughter

WAINWRIGHT —On April 7, the wife of Mr Denys Wainwright F R C S of Stoke on Trent—a daughter

WATSON —On April 11, in London the wife of Flight Lieutenant John Watson, M B —a daughter

MARRIAGES

BELDON—GAUNT —On April 7, at Calverley, Edgar Beldon lieutenant, R N V R, to Maria Lambert Gaunt, M B of Duchy Road Harrogate

HOBBS—KENNEDY —On April 11, at Oxford Henry Hobbs, F R C S, to Jean Kennedy

LENTON—NETHERCOT —On April 13 at Bristol, Peter Henry Lenton, captain R A M C, to Joan Nethercot

DEATHS

COX —On April 9, Edwin Marion Cox, M D COLUMBIA, L.S.A, of Holland Street, London, W 8 frequency and severity until the outburst of the major fit It seems probable that the freer diffusion of the drug into the subarachnoid space in these two animals promoted the well marked epileptic display observed and allowed a higher concentration of dissolved sulphathiazole to bathe the surface of the brain than in the preceding experiments

---

[1] Obtainable from Vitamins Ltd 23, Upper Mall, Hammersmith, London, W 6

In two further cats, sulphathiazole was applied to the lower surface of the frontal lobe well down towards the base, some of the drug also coming in contact with the lateral part of the sensori motor cortex in the region of the cruciate sulcus (dosage 0 2 and 0 86 g respectively), a frontal approach was used and the upper and lower walls of the frontal sinus on the side of operation were removed to gain the necessary access Also in two dogs of 7 and 9 kg the drug was applied, by temporal approach, in the middle fossa as far medially as the carotid artery and pituitary, the basal cistern being opened (dosage 0·3–0 4 g) Here again some of the drug was in contact with the lower part of the motor cortex The epileptic sequelæ were severe and prolonged The attacks began focally as in the first experiments, within the hour, increased in severity, and soon each terminated in generalised tonic-clonic involvement accompanied by snapping of the jaws salivation arrest of respiration and unconsciousness Duration 1–2 min, rather abrupt cessation followed by panting and somnolence frequency every 3–10 min, total duration of the epilepsy 36–48 hours

Thus sulphathiazole was applied to the cerebral surface on 10 occasions, with 9 positive results None of the animals succumbed and all recovered normal function The resultant epilepsy was most severe when the substance was applied to the base of the brain and seemed also to have some relation to the freedom with which the sulphathiazole could diffuse into the subarachnoid space and basal cisterns

Five control experiments with sulphapyridine in similar dosage were entirely negative The animals were three of the cats and the two dogs of the preceding sulphathiazole experiments, in each the sulphapyridine was applied symmetrically to the opposite hemisphere subsequent to the *sulphathiazole* experiment

Sulphadiazine and sulphacetamide ('Albucid') proved quite innocuous

Sulphadiazine (0 12–0 47 g) was applied to the *anterior* basal region of the brain subdurally in two cats, and to the brain surface in the anterior parietal region after multiple puncture of the arachnoid in one cat Neither epilepsy nor signs of focal cerebral dysfunction were noted thereafter

Exactly similar procedures on three cats, using sulphacetamide (0 18–0 32 g), likewise occasioned no disturbance

Posterior-fossa experiments—Although the small clinical experience of Mr Northfield and ourselves with sulphathiazole applied in the posterior fossa gave no reason to suspect complications Colonel Hugh Cairns has had one instance of epilepsy following application of sulphapyridine to the cerebellum It was therefore desirable to put the matter to experimental test Circumstances have prevented more than a small number of experiments in this part of the investigation

In three cats the posterior fossa was opened, exposing the vermis and part of each lateral cerebellar lobe The roof of the fourth ventricle was also opened up Sulphathiazole (0 47–0 56 g) was applied to the exposed brain and the neck muscles were sutured in place All three animals developed a more or less well-marked "cerebellar" syndrome, the outstanding features of which were imbalance and broad-based stance, hypotonia (especially of the forelimbs), and nystagmus No vomiting, but little or no food was taken for several days One of the three in which the exposure had been carried particularly far laterally on each side, also developed epilepsy about 5 hours after operation, differing from the fits of the preceding experiments in preliminary neck retraction with tonic extension of the forelimbs, proceeding in 7–10 sec to lateral flexion of the neck, twitching of the eyelids and face bilaterally, generalised clonic movements, snapping of the jaws and salivation, duration 20–30 sec in groups of two or three attacks in quick succession every 15–30 min Each attack ceased suddenly and there was no somnolence The attacks persisted with diminishing frequency and severity for 36 hours, leaving the ataxia and other phenomena noted above Recovery was complete in 4–7 days in all three animals

In two similar experiments on cats with sulphapyridine (0 33 and 0 37 g) the animals recovered normally and showed no evidence of cerebellar dysfunction This was in agreement with our clinical experience

It seems therefore a warrantable inference that sulphathiazole may be harmful when applied to the cerebellum in man Such a possibility cannot be excluded in our two cases, unfortunately both with large cerebellar tumours extending widely, and the considerable cerebellar dysfunction observed was to be expected for a time after operation Although both patients made good functional recoveries initial convalescence might possibly have been more rapid had sulphathiazole not been used Mr Northfield, however, thinks that his case showed no unusual postoperative disturbance

Histology—Further observations planned for histological purposes are necessary before conclusions can be drawn In most instances in the above work the animal was preserved for some weeks for continued observation and at autopsy the implanted drug had disappeared or, in much reduced quantity, was compacted into a white plaque separated from the adjacent tissues by a thin layer of organising exudate The animals of the posterior-fossa experiments were killed earlier, as soon as the ataxia and other signs had disappeared Preliminary evidence available from this limited material suggests that sulphathiazole in particular may have a pronounced local neurolytic effect on Purkinje cells in addition to setting up a considerable glial reaction in the cerebellar cortex

DISCUSSION

There are an increasing number of reports of toxic effects following continued oral or parenteral administration of the sulphonamides but with the exception of a report by Roseman and Aring (1941) of one case of hæmorrhagic encephalitis following sulphamethylthiazole (112 g in five days) in which terminal convulsions occurred there is no reference to epilepsy Hurteau (1941), in a research planned to investigate whether the sulphonamides had any unfavourable effect on healing of wounds of the brain, employed sulphathiazole in 7 cats and makes no mention of epileptic sequelæ His procedure involved the coring-out of a cylinder of cortex 0 5–1 cm in diameter, and after implantation of 70–110 mg of the drug the cerebral wound was covered over with amnioplastin, so as to keep the drug localised It may be presumed that this intention was realised and that sulphathiazole diffused into the neighbouring subarachnoid spaces in concentration too low for epilepsy to be induced Nevertheless, the foregoing observations show that when applied in powder form on or near the cerebral surface sulphathiazole is a powerful epileptogen The syndrome resulting both clinically and experimentally, has the characteristics of a true epilepsy This epileptogenic property is not shared by sulphanilamide, sulphapyridine, sulphadiazine or sulphacetamide and therefore seems to be associated with the thiazole part of the molecule, this possibility is under investigation

It will be noted that in the clinical cases recorded here epilepsy was observed after the frontal explorations alone—operations in which with one exception the basal fluid spaces had been exposed and opened In the animal experiments no such exclusive localisation of the convulsant effect was apparent, though the epilepsy was most severe and persistent when the anterior basal region of the cerebrum was chosen for experiment

Sulphathiazole may have some harmful effect on the cerebellum, as suggested in the small series of posterior-fossa experiments on cats The one instance of epilepsy in this series was of interest in that neck-retraction and tonic extensor rigidity of the forelimbs were in evidence before the clonic phase appeared Rather similar tonic attacks are seen clinically in some cases of compression of the midbrain by tumour and in traumatic lesions involving the midbrain

SUMMARY

Five cases of epilepsy following application of sulphathiazole in proximity to the brain in the frontal region are reported

This epileptogenic property of sulphathiazole has been confirmed experimentally in animals and is apparently not shared by sulphanilamide sulphapyridine sulphadiazine or sulphacetamide

Continued at foot of next page

attacks were readily controlled and soon ceased In case 9, only the external surface of the bone-flap was treated with powder and although the basal fluid spaces were opened extensively the epileptic attacks were focal and relatively mild A contributory alleviating factor may have been dilution of dissolved sulphathiazole by the large volume of fluid occupying the cavity resulting from the lobectomy

The general inference to be drawn is that the factors favouring development of epilepsy in these cases were the free opening of the cisternal spaces of the anterior basal region, and the placing of the drug so as to be freely accessible to the fluid of those spaces After frontal craniotomy, cerebrospinal fluid commonly accumulates under the scalp-flap in considerable quantity, more so than after lateral craniotomy, and thus a copious reservoir of fluid saturated with sulphathiazole can be formed superficially If, as is often the case, intracranial tension is low after operation, the tidal excursion of fluid through apertures in the dura mater at each pulse-beat contributes to rapid diffusion of the drug in solution within the cranial cavity

Interspersed with these 10 cases chronologically, and all treated with sulphathiazole locally, were several instances of scalp wounds without underlying fracture, two cranial exploratory burr-hole operations, two removals of cerebellar tumour, one occipital compound fracture involving craniectomy above and below the lateral sinus with exposure of the contents of the posterior fossa, and two laminectomies (one cervical) None of these patients showed any evidence of postoperative epilepsy In both the cerebellar cases the tumour was so situated that after surgical interference considerable immediate neurological dysfunction was to be anticipated, and was observed No clear parallel can therefore be drawn between these two cases and the posterior-fossa experiments recorded below

The dosage employed in each case is probably not important, owing to the relative insolubility of sulphathiazole, and it may be assumed that the drug was present in excess at least in the first day or two Sulphathiazole is soluble in water at 20° C only to the extent of about 1/2500 (40 mg per 100 c cm), the solubility is greater at body temperature, and amounts up to 104 mg per 100 c cm have been recovered from wound fluid (Ewins, A J quoted by Hawking 1941) The finding of as much as 14 8 mg per 100 c cm of the compound in the lumbar fluid (case 10, immediately after death) indicates that quite high local concentration may be reached in the fluid of the subarachnoid spaces at the site of operation

Other neurosurgeons in this country have told us of their experience with sulphathiazole Surgeon Captain Lambert Rogers had one case, involving a frontal bone-flap craniotomy for old compound depressed fracture, the dura being opened Powder (either sulphanilamide or sulphathiazole) was applied after the frontal lobe had been covered with a sheet of amnioplastin The patient recovered consciousness but later had numerous fits and became unconscious. The bone-flap was re-elevated 12 hours after operation but nothing untoward was found, more of the powder was applied Epileptic fits soon recurred and the patient became hyperthermic, dying 24 hours later There was later some doubt whether the powder used was indeed sulphathiazole, but the case so parallels those recorded here that there is good reason to suppose sulphathiazole was used Moreover it seems to be the general experience that sulphanilamide and sulphapyridine may be used freely on the cerebral surface without risk of epilepsy

Mr D W C Northfield implanted 2 g of sulphathiazole widely into the posterior fossa after total removal of a tumour of the cerebellopontine angle without observing associated ill effects This is in accord with our clinical experience

Lieut -Colonel E H Botterell informs us that Lieut -Colonel W V Cone, now overseas, used a mixture of approximately two parts sulphanilamide, two parts sulphathiazole and one part sulphapyridine, only a very thin layer being left on the brain surface, and that in a relatively small series they observed no epileptic complications with this mixture Unfortunately a survey of this material is not at present possible owing to transfer of records, and in particular the number of frontal explorations involved cannot be ascertained

SULPHAPYRIDINE

Our experience with sulphapyridine has includ 26 supratentorial exposures (more than half of the frontal region), and 5 cerebellar operations In postoperative recovery of consciousness was and convalescence was uneventful, with the exc of the following case

Man, aged 19, *acromegaly and gigantism* He was a operative risk on account of cardiac disease, but act to be taken to preserve vision By the transsphenoi *route access was gained to the adenoma*, and during operation it was noted that the basal subarachnoid space been entered Accordingly about 0 5 g sulphapyridine insufflated into the tumour cavity From the prompt or of polyuria, and blood staining of the CSF, operative d to the tuber was inferred Recovery of consciousness incomplete 28 hours after operation the patient pas into coma lasting nearly 2 hours, with initial epileptic symptoms After some improvement the general conditi progressively deteriorated without further epilepsy, and t patient died 52 hours after operation Autopsy not obtainab

The clinical picture was for the most part that spreading hypothalamic thrombosis, though there w undoubted epilepsy in the syndrome for a short perio With such direct access to the basal fluid spaces sulphapyridine may possibly have been responsible for t epileptic symptoms, but this seems improbable in view of our experience with transfrontal pituitary op corroborated further by the experimental work to later On the basis of this single and exceptio case it is not possible to associate local application sulphapyridine with subsequent epileptic manifestation

EXPERIMENTAL OBSERVATIONS

Experiments were undertaken in dogs and cats t elucidate several points arising out of this clinica experience The application of sulphathiazole to the cerebral surface was followed by an epileptic syndrome comparable to that observed clinically Sulphapyridine similarly applied was not associated with epilep nor were sulphadiazine or sulphacetamide Sulphanilamide was not used in this investigation since it was considered that clinical observations, and the experimental work of Russell and Falconer (1940) a Botterell and others (1941), with sulphanilamide provid sufficient evidence against its association with epileptic manifestations It had been our practice to sterili the sulphathiazole powder for use in operations in th autoclave as recommended by the manufacturers, the possibility that some chemical change might hav occurred in the process and might be responsible for the convulsant property of the powder was soon disproved Unsterilised powder obtained by crushing a table intended for oral administration was fully as effective experimentally By courtesy of the American Hospital in Great Britain a supply of sulphathiazole of Americ manufacture was provided, this proved equally potent

Experiments with sulphathiazole—In four cats (weight 1 6–2 5 kg), under intratracheal ether anæsthesia sulphathiazole in dosage of 0 14–0 23 g was applied to the cerebral *surface over the fronto-temporal area*, just behind the cruciate sulcus, the arachnoid being left intact All but one develop d epilepsy 1–2 hours later The attacks were focal, the contralateral *face, ear and neck muscles* showed typical tonic clonic sequence recurring every 3–5 min and lasting 5–15 se The onset was sudden, consciousness was not definitely lost while the attack was in progress but reflex reaction to tactile and auditory stimuli was reduced or almost in abeyance and pupils were dilated, reacting poorly to light Each *attack* ceased abruptly and normal *activity* was promptly resumed The attacks were most marked about six hours after the application of the sulphathiazole and ceased 12–15 hours later

In two cats the powder was applied over the occipito temporal region and free egress of fluid was assured by multiple punctures in the arachnoid Dosage of the drug was similar The development of the epilepsy was as previously, but soon each attack, initially focal, became generalised, with salivation and snapping of the jaws, and consciousness was lost The maximal duration was 2 min and the interval between these major attacks was 20–30 largely occupied in sleep Often as another major at was imminent larval focal attacks appeared, increasing

TABLE II—ATTRIBUTES WHICH WERE FOUND IN SIGNIFICANTLY DIFFERENT PROPORTIONS IN THE TWO HOSPITALS

—	Hosp A (%)	Hosp B (%)	Ratio diff to its standard error
Unsatisfactory work record			
Full duty	22	6	2 5
Discharged	38	11	3 6
Symptoms before enlistment			
Dull duty	42	13	3 7
Discharged	74	38	4 6
Psychopathic traits before			
Discharged	78	58	2 6
Dislike of Army in past			
Discharged	38	18	2 3
Adequate external cause			
Full duty	42	63	2 5
Discharged	30	60	3 7
Querulous hypochondriasis			
Discharged	40	11	3 8
Fugue, amnesia Discharged	26	10	2 3

of any attribute in the table depends on its having been reported in the notes . it is therefore likely that the figures, say, for " dislike of Army service," " keenness to return to the Army " or " querulous hypochondriasis " indicate only those in whom these features were prominent In one of our hospitals only half the material could be utilised for the recording of the first two of these attributes—i e , only those cases admitted after a time when the recording of these factors had shown itself to be important

Two different collections of statistical material cannot be combined for analysis unless it can be shown that there are not significant differences between the one collection and the other Therefore our two collections were compared with each other (table II) It was found that the difference between the two hospitals was more than twice its standard error in respect of the following attributes unsatisfactory work records, symptoms before enlistment, adequate external cause (difference significant in both full duty and discharged groups), and previous psychopathic traits, dislike of the Army, querulous hypochondriasis and fugue (difference significant in the discharged group only) It is probable that these differences are due to systematic differences between the two hospitals in the attention paid to these attributes, or the degree to which they had to be present before they were recorded, or possibly to a difference in the nature of the clinical material It would therefore be unsafe to combine the two sets of figures for the purpose of getting any *absolute* proportions This procedure would in any case be of little value because one has no wish to know the absolute frequency of, say, a positive family history in a special group of neurotics who were returned to duty, though its frequency in the general run of military neurotic patients would admittedly be of interest Furthermore our method of recording the presence or absence of an attribute did not provide for any variation in its intensity and such findings as " poor work record " might have been much more widely assessed by other investigators

TABLE III—PROPORTION OF THOSE WITH OMINOUS ATTRIBUTES IN EACH HOSPITAL WHO WERE SUBSEQUENTLY DISCHARGED FROM THE ARMY AS UNFIT

Attribute	Hospital A			Hospital B			Difference %	S E %
	No +	No dischd	%	No +	No dischd	%		
Unsatisfactory family history	33	20	60 6	77	44	57 2	3 5	
Poor school record	12	6	50	20	11	55	5	
Unsatisfactory childhood	40	23	57 5	60	33	55	2 5	
Unsatisfactory work record	30	19	63 3	17	11	64 7	1 4	
Psychopathic traits before	58	39	67 3	92	58	63	4 2	
Previous neurotic breakdown	22	12	54 5	32	21	65 6	11 1	
Symptoms before enlistment	58	37	63 8	51	38	74 5	10 7	
Dislike of Army in past	24	19	79 2	16	9	50 6	28 6	15
Not keen to go back to Army now	33	21	63 6	33	23	69 7	6 1	
Dunkirk, &c. not experienced	25	17	68	50	29	58	10	
No adequate external cause	36	21	58 3	23	63	51 2	7 1	
Physical factor or complication	24	14	58 3	57	32	56 1	2 2	
Conversion symptoms	29	18	62 1	39	22	56 4	5 7	
Querulous hypochondriasis	26	20	76 9	19	11	57 9	19	14
Depressive symptoms	43	22	51 2	80	36	45	6 2	
Anxiety symptoms	60	31	51 3	116	60	51 7	0 3	
Fugue, amnesia	15	13	86 7	18	10	55 6	31 1	14 6

But we are not concerned here with absolute frequencies but with differences or *relative* frequencies, and for this purpose our two collections of material can be safely combined When, of all persons showing a given attribute, the proportion having a bad subsequent record is compared with the proportion who subsequently did satisfactorily (table III), the differences between the two hospitals fade away In no case do the proportions calculated in the one hospital and the other differ by an amount approaching twice its standard error We can therefore say that in demonstrating the psychiatric differences between men with good and bad posthospital records the findings of our two hospitals confirm each other

SIGNIFICANCE OF OMINOUS ATTRIBUTES

The failure, already mentioned, to allow for different intensity of manifestation probably weakens our next step, which was to see whether the ominous attributes (those which were significantly more common in the men discharged from the Army) occurred together with such frequency in individuals that a mere counting of them might have prognostic value In other words, could it be shown that the occurrence in any individual of, say, five or more ominous attributes indicated an almost certain discharge from the Army, or that the occurrence of not more than one of the attributes in any individual meant that he had a good chance of doing well ? The weakness of this lies in the lumping together of attributes irrespective of their degree of severity in the individual patients, and in the concentration on ominous attributes without paying attention to the auspicious attributes We were aware of this omission, but considered it impracticable to deal statistically with the large number of favourable factors, though of course these had played the chief part in bringing about the permanent or temporary return to military duties, on discharge from hospital, of almost all the patients studied One of us first compared the number of men in each of his two groups of 50 who had one, two, or more, ominous attributes, with the following results

No of ominous attributes	0	1	2	3	4	5	6	7	8	9	10
No of "full duty' men with that no of attributes	3	11	10	5	7	5	6	1	2	0	0
No of " discharged " men with that no of attributes	0	1	4	3	8	9	9	6	3	4	3

It is evident from this analysis that 72% of those who did well in the Army had not more than four attributes, and that 68% of those who did badly in the Army had five or more attributes The result has a high degree of statistical significance ($\chi^2 = 16$, for one degree of freedom P <0 01)

One important purpose of such an analysis is to indicate the criteria on which unsuitability for the Army may be detected before actual breakdown has occurred The list of attributes, however, included symptoms such as hypochondriasis which if persistent would be enough to make Army duties impossible It was therefore necessary to make a reduced list eliminating from among the ominous attributes those which could be directly and solely decisive against doing well in the Army. These were active dislike of the Army and unwillingness to resume duty, hypochondriasis, amnesia and surly paranoid attitude Taking in each hospital 50 of the men on full duty and 50 discharged and combining them, the numbers in the reduced list were as follows

No of ominous attributes	0	1	2	3	4	5	6
No of "full duty' men with that no of attributes	21	21	20	12	12	10	4
No of " discharged " men with that no of attributes	8	14	17	20	13	17	11

Here the difference in distribution of the two groups is not so striking, nor does it reach such a high degree of

NEUROSIS IN SOLDIERS

A FOLLOW-UP STUDY

AUBREY LEWIS
M D ADELAIDE, F R C P
CLINICAL DIRECTOR AND LECTURER IN PSYCHIATRY TO THE MAUDSLEY HOSPITAL

ELIOT SLATER
M D CAMB , M R C P , D P M
CLINICAL DIRECTOR OF THE NEUROLOGICAL BLOCK AT AN EMS HOSPITAL

IN neurosis centres where most of the patients are soldiers, the success of treatment must be judged by the proportion of those treated who are able to resume and continue at military duties It is misleading to judge it by the proportion of those treated who, by the time they leave hospital, are either free of symptoms or merely thought likely to be able to carry out their military duties Neurotic illness is so dependent on circumstances, and especially on the stresses of the soldier's life, from some of which he is free while in hospital, that his condition after some weeks in this relatively sheltered place is not a sure indication of his fitness Conclusions about the success of treatment must therefore be based on condition 3 months, 6 months or more after discharge As with the assessment of treatment so with the assessment of prognosis It is not sufficient to weigh the likely prognostic factors in men who are apparently well on discharge from hospital against those in men who are invalided from the Army by a medical board because the hospital doctors and others think them unsuitable, that would only show the factors determining doctors' opinions about probable fitness for military duty It is necessary to compare groups in whom a trial of fitness after treatment has been made in the Army and the outcome ascertained

In each of the two hospitals in which we work two groups were compared one made up of men who on inquiry some months after discharge from hospital were doing full duty in the Army efficiently and willingly, and the other of men who sooner or later after return to duty had been discharged from the Army under para 390 (XVI) K R 1940 as ceasing to fulfil Army physical requirements. The groups consisted in the one hospital of 100 men each, and in the other hospital of 50 men each, in all, therefore, 150 men on full duty were compared with 150 men who had been discharged The samples were selected by taking all successive names, up to the required number, in the lists of men on whom the follow-up questionnaire had been answered by the commanding officer of the man's unit The records of these men had been compiled by many psychiatrists in the two hospitals, the extraction of data from the records was done by one person in each hospital. It was therefore unlikely that in the group as a whole individual bias could have greatly influenced what observations were made and recorded and unlikely that the extraction of the relevant data from the records was done inconsistently The conditions were thereby laid down for a statistically unobjectionable controlled experiment, such as is but seldom possible in clinical medicine

We took, first, 35 attributes which from experience and common belief might be thought of prognostic significance in cases such as these It soon became evident that some of them could not profitably be included, a reduced list of 20 attributes was finally taken, and the presence or absence of each attribute in the individual patients determined (table I) Combining our figures the significant differences between the "full duty" sample and the "discharged" are in respect of these attributes positive family history, unsatisfactory work record, psychopathic traits of personality, symptoms of the present illness before enlistment, previous dislike of Army service, keenness to get back to Army [illegible] exposure to Dunkirk or other severe stress of bomb ment and active service, querulous hypochondria complaints, amnesic phase, surly paranoid attitu

In every case the difference is to the disadvantage the discharged group, keenness to get back to the Arm and exposure to severe stress counting as favourable att butes, the rest as unfavourable ones In the case of these attributes the difference between the two groups more than twice its standard error, the actual ratio bein given in the last column of the table, but a glance down the table shows that there are consistent differences between the two groups in respect of all the other attributes, though they are not large enough to have individually, statistical significance In a few cases the difference is trifling—for instance, there is little difference shown in the average time spent in hospital, and in the frequency of anxiety symptoms or of an adequate precipitating cause (a favourable feature) In 2 cases the difference between the two groups is not quite what one might expect The presence of depressive symptoms is shown to be favourable rather than otherwise, and there is a surprisingly small difference between the two groups in the frequency of the grosser degree of stupidity as shown by school record One of us who first employed a less strict criterion (standard 6 or lower) obtained a larger difference between the two groups, but it was thought better to maintain the general rigour of definition throughout the table A "positive family history," for instance, means that at least one person among the patient's parents or siblings had an actual psychiatric illness for which he has been treated, or had shown a sufficiently gross degree of psychiatric abnormality to lead to social consequences The appearance

TABLE I—FREQUENCY OF CERTAIN FEATURES IN MEN ON FU DUTY, AND IN MEN DISCHARGED FROM THE ARMY, SO MONTHS AFTER TREATMENT IN HOSPITALS A AND B

	FULL DUTY		DISCHARGED		TOTAL		Rati diff to S of diff
	A (50)	B (100)	A (50)	B (100)	Full duty (150)	Discharged (150)	
Family history positive	13	30	20	44	43	64	2 6
Poor school record (St 5 or lower)	6	9	6	11	15	17	
Unsatisfactory childhood	17	27	23	33	44	56	
Unsatisfactory work record	11	6	19	11	17	30	[illegible]
Psychopathic traits before	19	34	39	58	53	97	[illegible] 3
Previous neurotic breakdown	10	11	12	21	21	33	
Symptoms before enlistment	21	13	37	38	34	75	5 1
Duration of stay in hospital (av days)	46	33	51	36	39	43	
Dislike of Army in the past	5	7 (of 50)	19	9 (of 50)	12 (of 100)	28 (of 100)	[illegible] 5
Keen to go back to Army now	21	23 (of 50)	12	10 (of 50)	44 (of 100)	22 (of 100)	3
Strain (Dunkirk, &c)	17	29	8	21	46	29	[illegible] 3
Adequate external cause	21	63	15	60	84	75	
Physical factor complication	10	25	14	32	35	46	
Conversion symptoms	11	17	18	22	28	40	
Querulous hypochondriasis	6	8	20	11	14	31	[illegible]
Depressive symptoms	21	44	22	36	65	58	
Anxiety symptoms	29	56	31	60	85	91	
Fugue, amnesia	2	8	13	10	10	23	[illegible] 4
Surliness, paranoid attitude	4	8	8	14	12	22	3
Fits and faints	7	6	8	12	13	20	

S E = Standard error

DR WATT, MR ALEXANDER (*continued*)

We are indebted to Mr Norman Dott for the opportunity of recording these observations, and to him and Prof J. R Learmonth for their criticism, also to the American Hospital in Great Britain, Dr John Martin of Chicago, and Dr J M Robson for providing us with some sulphonamide compounds not readily procurable Dr William Blackwood assisted in the interpretation of the histological material The expenses of the investigation were met by grants from the Earl of Moray Fund and the Wilkie Surgical Research Fund of the University of Edinburgh

REFERENCES

Botterell, E H , Carmichael, E A and Cone, W V (1941) *J Neurol Psychiat* 4 163
Hawking, F (1941) *Brit med J* i, 263
Hurteau, E F (1941) *J Canad med Ass* 44 352
Roseman E and Aring, C D (1941) *New Engl J Med* 224, 416
Russell, D S and Falconer, M A (1940) *Lancet*, ii, 100

Method of administration of pholedrine —In 1 c cm of pholedrine there is 0 02 g of pholedrine sulphate At first pholedrine was given intravenously The result was immediate and lasted up to ¼ hour, 0 2–0 25 c cm was found to be the useful dose, amounts above this being followed by excessive rises Intramuscular injections of pholedrine 0 75–1 c cm, act in 3–5 min, restoring a fallen pressure to about the normal for 20–40 min At the end of a long operation, when one or two administrations have already been made, 1 25–1 5 c cm are necessary When the blood-pressure fall is extreme, 0 2–0 25 c cm intravenously plus 0 75–0 8 c cm intramuscularly will give an instantaneous rise lasting for 30–40 min

Subcutaneous injections are undependable for the low systolic pressures encountered at operations, but are useful for debilitated subjects in the ward, to raise the pressure before or after operation when the levels are not as low as those found during operations

Leptazol ('Cardiazol') was often given with the pholedrine in cases where the pulse was irregular, where the colour was poor, the patient sweating, breathing difficult or there was reason to suspect cardiac weakness The combination exerts a stronger pressor effect than veritol alone Leptazol alone was found to exert no pressor effect when given intravenously intramuscularly or subcutaneously in doses up to 1 c cm

RESULTS

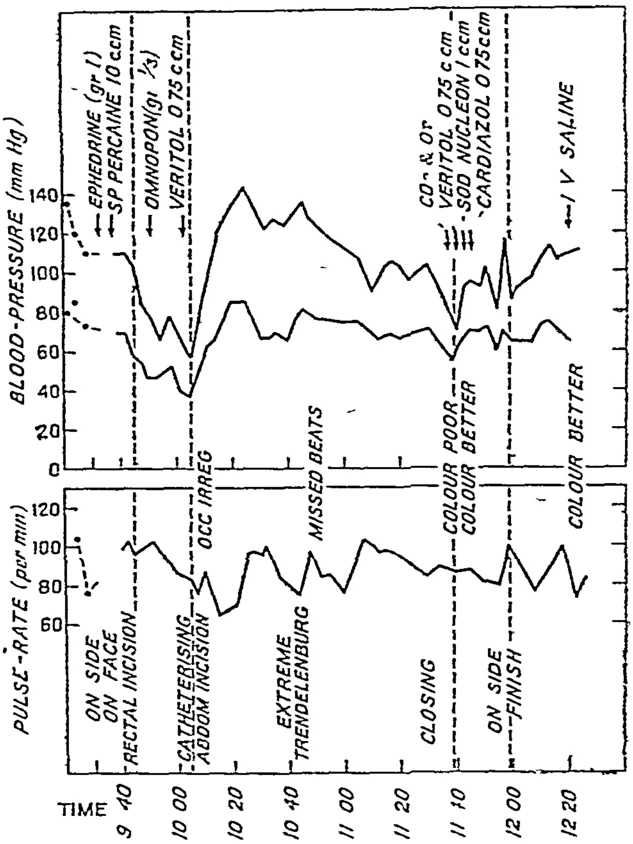
The table gives the results in 89 operations where pholedrine was given The responses were divided into three grades The response was called normal if it brought the systolic blood-pressure to within 25% of the preoperative level, a small response was recorded where the pressure rose to less than this, and an excessive response where it rose to over 25% above the preoperative figure In no case was a fall in pressure noted after injection of pholedrine, but in 3 instances irregularity and occasional missed beats in the pulse were noted after its use

Single administrations —Of the 89 patients on whom pholedrine was used 60 required a single dose, and of these 53 (89%) responded to within 25% of the normal systolic blood-pressure In 6 there was an excessive rise, 2 of these were undergoing operations for herniæ under spinal anæsthesia where the operative shock was small and the patient's power of response good, so that pholedrine was not strictly necessary. This point was realised as the study proceeded In case 35 the systolic pressure was raised from 80 to 190 mm Hg (normal 135 mm) on account of irregularity of the pulse leptazol 1 c cm was given with the pholedrine and this case illustrates the powerful effect of the combination, especially in shocked patients In case 38 in which the systolic pressure was raised from 80 to 200 mm for 135 min, pholedrine 0 5 c cm was given intravenously as well as 0 5 c cm intramuscularly, this was one of the first patients to whom the drug was given by both routes and the intravenous amount was excessive Subsequent experience has shown that 0 2–0 25 c cm is the maximum useful intravenous dose, followed by 0 8–0 75 c cm intramuscularly In only one case was the response small after a single dose (case 68 radical excision of carcinoma of the breast) Here the pressure was raised from 60 mm to 95 mm for 45 min after pholedrine 0 5 c cm, a dose which was too small to produce an adequate rise, but this was intentional, since to minimise bleeding from a large wound it is my practice to allow the blood-pressure to remain low

EFFECTS OF PHOLEDRINE IN SINGLE AND REPEATED DOSES IN 89 PATIENTS

Operations	Single dose response				Repeated doses response				
	Cases	Normal	Excessive	Small	Cases	Doses	Normal	Excessive	Small
Cholecystectomy and choledochostomy	15	13	2	(1*)	8	19	14	3	2
Partial gastrectomy for gastric and duodenal ulcers	12	11	1		2	4	3	1	
Partial gastrectomy for carcinoma of stomach	5	5							
Excision of colon and rectum for carcinoma	8	8			6	16	15		1
Radical excision of breast for carcinoma	3	2		1	4	11	6		5
Laparotomy and appendicectomy	6	5	1						
Radical cure of inguinal hernia	4	2	2						
Pneumonectomy					1	3	2	1	
Block excision of malignant glands of neck	1	1			1	2	1		1
Cervical sympathectomy	1	1							
Operations on kidney and bladder for stone or carcinoma	5	5			5	10	8		2
Total	60	53	6	1	27	65	49	5	11

• Case 12 subcutaneous administration



Simplified version of record chart in a man of 73 years during 2nd stage of resection of carcinoma of rectum. Omnopon gr ⅓ scopolamine gr 1/150 and nikethamide (Coramine) 0 5 c cm were given at 9 A.M Spinal anæsthesia Patient died from heart failure four days after operation

Thus in 59 of 60 patients (98%) with low pressure during operation the normal systolic pressure was restored or exceeded after a single dose of pholedrine

Repeated injections —On the evidence of the blood-pressure charts and the clinical condition, repeated doses were judged necessary in 27 patients, 66 doses being given in all In 49 (74%) the pressure was restored to within 25% of the preoperative level There were 5 excessive responses 3 during operations on the gall-bladder and common bile-duct and one each during partial gastrectomy (local infiltration gas and oxygen) and pneumonectomy (spinal anæsthesia)

CASE 9 —Preoperative BP 135/95 mm Hg Cholecystectomy and exploration of common bile duct under spinal percaine Duration of operation 90 min Systolic pressure fell to 85 mm, pholedrine 1½ c cm raised it to 180 mm for 35 min It then fell to 70 mm, pholedrine 1 c cm raised it to 105 mm for 45 min Another fall to 73 mm, pholedrine 1 c cm raised it to 153 mm for 45 min After a further fall to statistical significance, though still an adequate one ($\chi^2 = 14·6$, for 6 degrees of freedom $P < 0·025$). It will be seen that 74% of those on full duty have 3 or less of the ominous attributes listed in this table.

Because of these findings, at one of the hospitals the records were re-examined of those men who had been sent back to the Army in spite of their possessing six or more of the ominous attributes, and who had subsequently been discharged from the Army. In 6 instances, it was found, the psychiatrist who had been treating the patient in the neurosis centre had advised his discharge from the Army, but the military board had not agreed with this opinion and had sent the man back in a lower category. In the other instances the psychiatrist had either recommended that the man should be tried in a lower category on home service or had been influenced by the man's keenness to return to military duty. In 7 of them the fact that the man had improved rapidly while in hospital and was almost free from symptoms had led to his return, although the prognosis for military duty could be recognised as decidedly poor. On the other hand the one patient with less than two ominous attributes who had been subsequently discharged was found to have hysterical conversion symptoms which in themselves were *sufficient to make military duty impossible.*

* * *

It is important to recognise that the patients studied had been discharged from hospital before the procedure was introduced whereby a neurotic soldier, previously engaged in duties for which he was unfitted, could be transferred to more suitable duties on the psychiatrist's recommendation. There are grounds for believing that the results obtained since that procedure has been used are more satisfactory, and that criteria of prognosis will have changed correspondingly. It is obvious that prognosis must be influenced by the conditions under which the soldier will be working when he resumes duty on leaving hospital.

SUMMARY AND CONCLUSION

At two hospitals for the treatment of neurosis a group of soldiers who on return to the Army after treatment were still on full duty some months later were compared with a group of those who had subsequently to be discharged from the Army. The medical records of 300 soldiers (150 in each group) were investigated, and 10 features determined which occurred with significantly different frequency. There were consistent differences in the frequencies of other features, which were however, individually, not statistically significant.

Comparison of the separate data of the two hospitals confirmed this.

The traits which were found with significantly greater frequency in men who proved unsuitable for military duty were: a history of mental disturbance, including neurosis, in parents or siblings; unsatisfactory work record prior to enlistment; psychopathic traits of personality; symptoms of the present illness before enlistment; resentment or strong dislike of Army life; reluctance to return to Army duties; onset of the illness without its having been precipitated by exposure to *bombardment, continuous danger, and other stresses of* active service; querulous hypochondriasis; fugue or amnesia; and surly or paranoid attitude.

The fewer of these attributes a patient has the greater the likelihood of his remaining in the Army. The evidence however does not indicate that prognosis can be safely based on the number of these attributes a patient is found to possess. The intensity with which each such attribute has been exhibited, its nature, and the favourable attributes also discovered must be taken fully into account in each case.

The findings do not pay regard to the varying conditions of Army life, to which soldiers return; these also are important in determining the course of the man's illness and successful adaptation to Army requirements. The groups investigated were dealt with before a new and valuable procedure had been introduced permitting a measure of adjustment to be made on the psychiatrist's recommendation.

AUXILIARY R.A.M.C. FUNDS.—The annual meeting of members will be held at 5 P.M., on Friday, May 1, at 11, Chandos Street, London, W.1.

USE OF
PHOLEDRINE AT MAJOR OPERATIONS

HAROLD DODD, CH.M. LPOOL, F.R.C.S.
SURGEON TO KING GEORGE HOSPITAL, ILFORD; SURGEON, E.M.S.

PHOLEDRINE ('Veritol') is a comparatively n pressor agent which came to this country from German with good clinical reports in 1937. Hicks (1937) brough it to my notice, and I began a clinical study of its u during and after major general operations under al types of anæsthesia. My findings (1939, 1940) were i accord with the claims of the German authorities, an much subsequent work has confirmed the value pholedrine, but Schoenwald, Schweitzer and Steel (1940 from animal observations reached adverse conclusions.

This article deals with the restorative action o pholedrine on the blood-pressure during and after ma operations—that is, with purely clinical findings. Blood pressure records during operations have been made si 1932; in this article the results from nearly 300 unselected charts are used.

Most of the charts have been made by Mr. Gerald Marte, Ph.D., at first with the mercury sphygmomanometer, an later with the oscillometer, which besides giving the blood pressure gives some indication of the volume of the pulse by the amplitude of the needle oscillations. This swing at the beginning of operations is usually 25–40 dial calibration, but after 1½–2 hours, although the pulse rate and the blood pressure may be around normal, the swing has often fallen 10–15 divisions; thus some indication of the output of the heart is available, an important factor in shock. Most of the charts were obtained during important operations where shock in some degree was always present. The purpose of the observations was to anticipate and prevent shock; they were in no way experimental. On many patients the readings were continued for some time after the operation and in the ward for the next few days.

At first every large fall in blood-pressure was treated in some way—e.g., ephedrine, pholedrine or inhalation of carbon dioxide—but latterly pressor agents were used only to counteract serious falls of blood pressure and when the patient's condition caused anxiety. Where the falls could be attributed to the immediate effects of *operation time was allowed for the patient's* recuperative power to act before resorting to stimulants. Some of the earlier patients were given unnecessary and incorrect doses of pholedrine, which produced excessive rises in blood-pressure.

The anæsthetics used included (*a*) spinal 1 in 1500 'Percaine,' which in some instances was supplemented by gas-oxygen, open ether, gas-oxygen with cyclopropane, ether or 'Vinesthene,' or by 'Pentothal'; (*b*) general anæsthesia with gas and oxygen, gas oxygen and ether, gas-oxygen and cyclopropane, gas oxygen and vinesthene and open ether; (*c*) local anæsthesia, employed with increasing frequency since June, 1937, sometimes alone, or supplemented by gas oxygen, ether, cyclopropane, pentothal or light open ether. Thus *pholedrine has been tried* with most anæsthetics in current use. With local anæsthesia the falls in blood pressure have been less and the corrections required reduced. Not all of the 300 patients required a pressor drug; in fact with increasing experience stimulants have been used less and less. Several pressor agents have been used but pholedrine has been the main one since January, 1938.

Ephedrine, gr. ½–1, intramuscularly was given before spinal anæsthesia was administered. The blood pressure charts showed that gr. 1 was the minimum dependable preoperative dose to protect an adult against a fall in blood pressure during operations under spinal anæsthesia. During operations, ephedrine gr. ½ was injected intravenously to counteract falls under spinal anæsthesia; pholedrine ousted it because it was *more consistent* in effect, acted for longer periods, was effective in repeated doses and was equally potent intramuscularly.

Hypertonic saline (30%), 20–40 c.cm. intravenously, will raise the blood pressure and improve the patient's colour, especially during operations under spinal anæsthesia (Walker 1936). It also reduces the incidence of headaches after spinal anæsthetics.

a trained observer three times in 126 administrations, ut otherwise no ill effects were observed

Leptazol was found to be ineffective by itself but when ombined with pholedrine had a powerful pressor effect

I am indebted to Dr Gerald Merton for making observations t operations between 1935 and 1939, war time blood ansfusion work prevents him joining in this paper

REFERENCES

odd, H (1940) *Lancet* i 358
— and Merton, G (1939) *Brit J Surg* 27, 78
icks S (1937) *Aust J Surg* ii 112
choenwald G Schweitzer A and Steel, G C (1940) *Lancet*, i 544
alker, J (1936) *Brit J Surg* 24, 105

ANEURINE AND CARBOHYDRATE METABOLISM IN DIABETICS

E KODICEK, M D PRAGUE

(Dunn Nutritional Laboratory, University of Cambridge and Medical Research Council)

THE action of aneurine (vitamin B_1) has been linked up with carbohydrate metabolism by the identification of cocarboxylase as aneurine pyrophosphate (Lohmann and Schuster 1937) This substance is believed to exert its catalytic influence in the pyruvic-acid stage in the breakdown of carbohydrates (Peters 1940) The phosphorylation of both hexosemonophosphate and glucose itself during oxidation of pyruvic acid may be another important factor relating aneurine to carbohydrate metabolism (Ochoa 1940) Also aneurine may be involved in Krebs s C_4 acid cycle and in the carboxylation of certain carbohydrate metabolites (Krebs 1941)

Although these findings prove the close connexion of aneurine with carbohydrate metabolism, the question whether aneurine influences the level of blood-sugar in animals and particularly in man is still controversial Some direct influence on the blood-sugar might be expected but it is doubtful whether under physiological conditions such action will be effective enough to overpower the regulatory mechanism maintaining the blood-sugar level This is of practical importance because claims have been made that vitamin B_1 exerts a beneficial effect in diabetic patients, both on blood-sugar and on the response to insulin (Desgrez et al 1923, Lewinson 1937, Gottlebe 1938, Beckert 1938)

Since Funk and Schönborn (1914) first reported that hyperglycæmia is produced in pigeons kept on a vitamin B_1 deficient diet, various others have reported similar although rather variable results (Random and Lelesz 1926, Labbe et al 1933) In vitamin-B_1 deficient rats, however, Eggleton and Gross (1925) Bell (1931), Kodicek and Joachim (1935) did not find any significant rise of blood sugar, and equally negative results were obtained by Stucky and Rose (1929) in vitamin-B_1 deficient dogs Lepkowsky and his colleagues (1930) found a disturbance in sugar tolerance in rats with vitamin B_1 deficiency, but it was late in appearing and was possibly of a secondary nature The fasting blood sugar levels of deficient rats remained within normal limits On the other hand, Lajos (1936) reported a rise in the fasting blood sugar in vitamin B_1 deficient rats, and Usuki (1936) in deficient dogs, especially in the last stages of deficiency The hyperglycæmia returned rapidly to normal after administration of vitamin B_1 The influence of vitamin B_1 on the blood sugar of normal dogs and rabbits was studied by Tislowitz (1937) He found on administration of aneurine an increased sugar tolerance and an increased sensitivity of the normal dogs to insulin Also Burke and McIntyre (1938, 1939) state that the presence of aneurine in a diet otherwise deficient in vitamin B complex increased the sensitivity of the rat to insulin But according to later experiments by Martin (1937) aneurine was ineffective in curing the insulin resistant hyperglycæmia of depancreatised dogs, which had been kept on a vitamin B deficient diet for 6–7 weeks and treated with insulin A mixture of aneurine and riboflavin promptly corrected the disturbance in the sugar metabolism If these findings could be confirmed, they would show the importance of the vitamin B complex rather than of aneurine only

TABLE I—BLOOD SUGAR CURVES OF DIABETICS AFTER INTRAVENOUS INJECTION OF 2 MG OF ANEURINE

Patient	Blood-sugar (mg per 100 c cm) Fasting	After injection of 2 mg aneurine 30 min	60 min	120 min
1	318	280	208	268
2	208	223	173	208
3	138	125	120	125
4	228	164	194	228
5	163	126	83	200
6	106	173	194	186
7	164	154	163	182
8	144	75	154	144
9	126	126	144	134
10	275	235	295	344
11	194	235	218	200
12	272	294	314	236
13	173	270	330	320
14	323	282	278	253
15	125	130	175	120
16	194	173	218	218
17	181	194	125	208
18	144	106	245	200
19	228	200	218	245
20	184	200	262	228
Mean	194 7	188 3	205 6	209 9
Differences from mean of fasting level		−6 4	+10 9	+15 2

Variance ratio = $\frac{V_1}{V_2} = \frac{1958\ 6}{[illegible]}$ = 1 5184 z = $\frac{1}{2}$ log e [illegible]

The position is equally confusing with regard to human blood-sugar levels and the response towards insulin, especially in diabetic patients Vorhaus and his colleagues (1935), Lewinson (1937) Gottlebe (1938), Mosonyi and Aszodi (1938) reported that aneurine slightly lowered the blood-sugar in diabetics, and increased both their sugar tolerance and their sensitivity to insulin Many workers, however, have found no such favourable influence of aneurine on blood sugar Priesel and Wagner (1930), Jonata (1931), Drigalski (1935) Schröder (1937), Smith and Mason of the Mayo Clinic (1940) and Joslin (1940) reported negative results Owens and his colleagues (1940) could not reduce the insulin requirement of well-controlled diabetics, even when large amounts of aneurine and riboflavin were administered Serious criticisms have also been raised in several monographs (Harris 1938, Williams and Spies 1938, Joslin 1940)

TABLE IV—DIFFERENCES BETWEEN VALUES IN TABLES II AND III

Patient	Blood sugar (Δ) Fasting	30 min	60 min	120 min
21	− 10	− 28	+ 18	− 57
22	0	− 20	+ 37	+ 38
23	+ 30	+ 46	+ 10	+ 8
24	+ 62	− 18	+ 38	+ 68
25	0	− 10	− 35	−130
26	− 29	− 94	+ 10	− 37
27	0	+ 78	− 89	−174
28	− 63	0	− 20	− 38
29	0	− 18	− 71	− 10
30	− 34	− 27	− 10	+ 31
31	+ 63	+ 66	+135	+ 99
32	+127	+ 70	+ 77	+ 14
Mean	+ 12 2	+ 3 8	8 3	− 15 7

Mean difference of 48 readings = $\frac{\Sigma\Delta}{48}$ = + 2 2

Standard error of the mean difference = 10 4

" " " " of 12 patients = 20 8

TABLE II—BLOOD SUGAR CURVES OF DIABETICS TREATED WITH 20 I U OF INSULIN SUBCUTANEOUSLY CONTROLS

Patient	Blood sugar (mg per 100 c cm) Fasting	After injection of 20 I U insulin 30 min	60 min	120 min
21	218	228	126	163
22	173	200	126	97
23	300	268	235	200
24	200	200	106	106
25	308	245	235	312
26	274	312	218	245
27	312	228	280	280
28	245	163	163	135
29	314	280	262	154
30	314	262	218	85
31	182	154	75	55
[illegible]	[illegible]	[illegible]	85	50
Mean	247 9	219 3	177 4	156 8

TABLE III—BLOOD-SUGAR CURVES OF DIABETICS FROM TABLE II TREATED WITH 20 I U INSULIN AND 2 MG ANEURINE

Blood-sugar (mg per 100 c cm) Fasting	After injections of insulin and aneurine 30 min	60 min	120 min
208	200	144	106
173	180	163	135
330	314	245	208
262	182	144	173
308	235	200	182
245	218	228	208
213	306	191	106
182	163	143	97
314	262	191	144
280	235	208	116
245	220	210	154
262	162	162	64
260 1	223 1	187 4	141 1

100 mm pholedrine 1 c cm raised it to 135 mm for 60 min (The observations were continued in the ward after the operation)

CASE 14 —Preoperative BP 180/115 mm Hg Cholecystectomy under open ether Pholedrine 1 c cm raised systolic pressure from 115 to 230 mm for 50 min This is an exceptional response , possibly some of the injections passed into a vein

CASE 20 —*Preoperative BP 155/85 mm Hg Cholecystec*tomy under spinal percaine After 1 c cm of pholedrine no change occurred for 10 min , although pholedrine intramuscularly usually acts in 3–5 min A further 1 c cm was given and in 5 min the systolic reading rose from 0 to 160 mm and within 20 min it had risen to 210 mm The patient was stout and perhaps the first dose was subcutaneous and did not take effect until the second dose improved the circulation

CASE 38 —Preoperative BP 135/90 mm Hg Partial gastrectomy under local and gas and oxygen Systolic pressure fell to 80 mm , pholedrine ½ c cm intramuscularly and 0 5 c cm intravenously raised it to 200 mm for 30 min Later it fell to 10 mm , pholedrine 0 5 c cm intravenously raised it to 140 mm (Excessive intravenous dose)

CASE 73 —Preoperative BP 130/90 mm Hg Pneumonectomy At start of operation systolic pressure fell to 85 and pulse was irregular Pholedrine 1 c cm with leptazol 1 c cm raised systolic pressure to 175 mm for 30 min After another 20 min it had fallen to 90 mm , pholedrine 1 c cm with leptazol 1 c cm raised it to 115 mm for 45 min After 105 min pressure was 100 mm and pholedrine 0 25 c cm with leptazol 0 25 c cm raised it to 130 mm for 30 min The excessive response was, I think, due to leptazol being given with the pholedrine

A small response in the repeated-dose series was noted in 9 patients (18%) In only one patient was there no rise The increase was often just short of " normal " and there was clinical benefit to the patient

CASE 8 —Preoperative BP 140/85 mm Hg Cholecystectomy under local anæsthesia Duration of operation 2 hr Systolic pressure fell to 100 mm , pholedrine 1 c cm raised it to 165 mm for 110 min , after which it fell to 65 mm and pholedrine 1 c cm raised it to 90 mm (observations were continued in ward after operation)

CASE 15 —Preoperative BP 145/90 mm Hg Cholecystec*tomy under gas, oxygen and ether Duration of operation* 1 hr During operation systolic pressure fell to 78 mm and pulse was irregular , pholedrine 1 c cm with leptazol 1 c cm intramuscularly raised pressure to 135 mm for 30 min , followed by a further rise to 185 for 15 min , when it fell in 40 min to 95 mm Pholedrine 1 c cm with leptazol 1 c cm had no effect in 20 min Pholedrine 1 c cm and leptazol 1 c cm were repeated, and pressure then rose to 110 mm and slowly to 115 mm in the next 40 min

CASE 54 —Woman aged 77 Preoperative BP 180/100 mm Hg Resection of carcinoma of rectum under spinal percaine After operation started systolic pressure fell to 80 mm Pholedrine 0 25 c cm intravenously and 0 75 c cm intramuscularly raised it to 156 mm for 25 min In 35 min it had fallen to 85 mm , but 1 c cm of pholedrine raised it to 130 mm for 25 min , when it fell to 75 mm in 30 min Pholedrine 1 c cm then restored it to 130 mm The two last rises did not reach 25% of the preoperative figure, but they brought the pressure to a satisfactory clinical level

CASE 60 —Woman, aged 36, a fragile subject Preoperative BP 135/85 mm Hg Carcinoma of breast Radical excision under gas and oxygen Duration of operation 80 min After 45 min systolic pressure fell to 0 Pholedrine 0 7 c cm raised it to 125 mm for 20 min It then fell to 105 mm and pholedrine 0 25 c cm intramuscularly kept it at that figure for 30 min , when it fell to 95 mm Pholedrine 0 5 c cm with leptazol 0 5 c cm then raised it to 110 mm but it gradually fell to 65 mm in the next hour Pholedrine 1 c cm intramuscularly slightly raised it to 80 mm in 20 min Finally, pholedrine 1 c cm with leptazol 1 c cm brought it to 100 mm

CASE 62 —Carcinoma of breast Radical excision under gas, oxygen and ether Preoperative BP 115/68 mm Hg Duration of operation 75 min After 20 min systolic pressure fell to 65 mm , pholedrine 1 c cm raised it to 95 mm for 15 min Pressure then fell to 65 mm and pholedrine 1 c cm raised it to 85 mm for 45 min

CASE 63 —Carcinoma of breast Radical excision under gas, oxygen and ether Preoperative BP 160/90 mm Hg Duration of operation 80 min Pressure fell to 65 mm after 30 min Pholedrine 1 c cm raised it to 95 mm for 15 min It then fell to 65 mm and pholedrine 1 c cm raised it to 85 mm for 45 min

CASE 64 —Radical excision of carcinoma of breast, under spinal percaine Preoperative BP 130/90 mm Hg *Duration of operation 65 min Systolic pressure fell to 70 mm* before operation started Pholedrine 0 2 c cm intravenously and 0 8 c cm intramuscularly raised it to 160 mm in 5 min , *20 min later it was 70 mm and later 0 Pholedrine 1 c cm* intramuscularly restored it to 80 mm for 1 hour, when observations stopped

The modified response in these radical breast operations will be noted, the normal systolic level was seldom restored by pholedrine, but this was never pressed, because in order to minimise the bleeding the blood pressure was allowed to remain low

CASE 84 —Nephrectomy for massive carcinoma of kidney performed under local infiltration and open ether Preoperative BP 130/80 mm Hg Duration of operation 2 hr After 75 min systolic pressure fell to 65 mm , pholedrine 1 c cm raised it to 85 mm for 30 min , when it fell again and a further 1 c cm of pholedrine only raised it to 90 mm

CASE 89 —Age 70 Preoperative BP 150/90 mm Hg Malignant glands of neck Excision under gas, oxygen and ether Systolic pressure fell to 90 mm , pholedrine 1 c cm with leptazol 1 c cm raised it to 110 mm , but later it receded to 80 mm , pholedrine 1 c cm with leptazol 1 c cm raised it to 160 mm

INSTRUCTIVE CASES

The following case illustrates the effective clinical dose of pholedrine

CASE 86 —*Woman, aged 41 Preoperative* systolic pressure 120 mm Hg During nephrectomy, systolic pressure fell to 80 mm and remained so for 20 min , there was thus no natural tendency to recover Every 5 min pholedrine 0 25 c cm was given intramuscularly , there was no response until the fourth injection, when the systolic reading rose from 80 to 120 mm and remained so for 135 min

The next two show that pholedrine by mouth may be ineffective in the presence of shock, but produces good results when given intramuscularly, and that pholedrine is ineffective when given subcutaneously during operation

CASE 10 —Cholecystectomy under spinal percaine Preoperative BP 130/85 mm Hg In the ward 1 hr after operation systolic pressure was 95 mm Pholedrine 1 c cm was given by mouth but no effect was detected in 18 min Pholedrine 0 75 c cm given intramuscularly raised the pressure to 115 mm immediately

CASE 12 —Preoperative BP 155/90 mm Hg Cholecystectomy under local infiltration and open ether Systolic pressure fell during operation to 100 mm , pholedrine 1 c cm subcutaneously had no effect in 20 min

SUMMARY

An analysis is made of the blood-pressure charts of 80 patients who received the pressor drug pholedrine during major surgical operations

The anæsthetics given included all those now in common use, whether general, spinal or local

The effective dose of pholedrine was found to be 0 2–0 25 c cm intravenously , 1 c cm intramuscularly, or 0 2–0 25 c cm intravenously plus 0 75–0 8 c cm intramuscularly

Pholedrine given in these amounts as a single dose raised a low blood-pressure to within 25% of the normal in 89% of patients

Pholedrine given in repeated doses (up to five) still raised the pressure to normal or over in 82% of cases A useful rise was noted in almost all subjects, when the correct dose was used If the operation is long or shock is appreciable the intramuscular dose may be increased to 1 5 c cm

In 126 injections of pholedrine no fall in pressure was observed

Excessive rises in pressure after pholedrine are avoided by correct assessment of the patient's condition and accurate estimation of the dose The patient's own recuperative power must be reckoned with and given time to act

Variability of the pulse after pholedrine was noted have been due partially to the premedication Blood-pressure usually remains unaltered or shows a slight tendency to rise The pulse on the whole is not affected in rate or quality At the outset a few cases were noted where the pulse became slow and grossly irregular but this was attributed to some degree of anoxæmia and has not been seen since it was realised that a considerably greater percentage of oxygen is necessary than when using ether This seems to be an important point

Postoperative complications were much fewer than when ether was used Vomiting was rare and no chest complication was seen Restlessness was diminished, and ward sisters were enthusiastic advocates of the drug

---

ENCEPHALOPATHIA ARTERIOLO-SCLEROTICA BASALIS LETHARGICA

F Parkes Weber,
M D CAMB, F R C P
PHYSICIAN TO THE GERMAN HOSPITAL, LONDON

K Blum,
M.D BRNO
HOUSE PHYSICIAN AT THE HOSPITAL

Somnolence or lethargy from brain disease, when it occurs as a main symptom without gross compression (large tumours, abscesses, hæmorrhages, internal hydrocephalus), is often associated with paralysis of eye muscles and ptosis This favours the view that the oculomotor nerve nuclei are intimately connected with the sleep centre, as Mauthner suggested in 1890 A striking example of this association is the encephalopathia first described by Wernicke in 1881, and named by him polioencephalitis acuta hæmorrhagica superior, this condition is now supposed to be due to deficiency of vitamin B_1 and to various toxic and other conditions (Campbell and Biggart 1939) Owing to the predominance of lethargy in the clinical picture Economo named the epidemic encephalitis which he described in 1917, "encephalitis lethargica" The encephalopathy in our case clinically so closely resembled encephalitis lethargica that it might be called pseudo-encephalitis lethargica, but we suggest that a more suitable term is encephalopathia arteriolosclerotica basalis lethargica

CASE-HISTORY

A married Englishwoman, aged 63, was admitted unconscious on Feb 6, 1941, having collapsed in the street after ailing for a few days with headache and tiredness According to her daughter she had been "knocked about" in an Anderson shelter during two or three air-raids in September, 1940 Otherwise there was nothing special in her past history She had occasionally taken alcohol in moderation In the hospital she was somewhat restless, somnolent, breathing normally She was small and thin and her skin was somewhat atrophic Temperature 97° F, pulse rate 72 Brachial blood pressure, 135/85 mm Hg Nothing abnormal on examination of heart, lungs and abdomen, no enlargement of liver or spleen Pupils unequal, right larger than left, the left reacted well, the right sluggishly Knee-jerks present on both sides No plantar reflex obtained Some cutaneous hyperæsthesia Urine specific gravity 1024, acid, trace of albumin, no sugar, a few leucocytes and calcium oxalate crystals in the centrifuged deposit Blood Wassermann reaction negative Blood count on Feb 18 red cells 6,100,000, Hb 110%, colour index 0 9, white cells 6800, polymorphs 69%, lymphocytes 21%, monocytes 4%, eosinophils 6%)

On Feb 20 she was still lethargic, but she could sometimes be roused to answer questions and could be fed with a spoon, though insufficiently The temperature and respiration were normal, though during the first week in hospital the temperature had been slightly raised (never above 101 4° F) and the pulse rate somewhat rapid There was slight but definite ptosis on the right side. The right eye appeared to diverge slightly to the right, as if from paresis of the internal rectus oculi Ophthalmoscopy by Dr Charles Markus revealed nothing abnormal in either fundus, there was no cataract Lumbar puncture was impossible owing to kyphoscoliosis

The lethargy deepened and early in March no answer could be obtained to questions She could not take food. The ptosis on the right side increased, the right pupil was larger and reacted sluggishly and afterwards not at all, whereas the left pupil reacted promptly to light Treatment was by hexamine caffein injections and (on account of the dehydration) by subcutaneous infusions of hypertonic saline On March 8 the temperature in the morning was 104° F and there were pneumonic signs on the left side, breathing was difficult She died at midday

Post mortem examination of the head only was permitted The brain weighed 1265 g, its surface was very congested; there was no internal hydrocephalus The pituitary gland appeared macroscopically normal Dr J G Greenfield gave the following report on the brain Macroscopically a small hæmorrhage with surrounding softening is seen in the centre of the right optic thalamus Microscopically this softening extends outwards between the red nucleus and the superior nucleus of the thalamus from the wall of the ventricle for about two-thirds of the width of the thalamus There are also several small old softenings in the right lenticular nucleus On the left side there is a smaller focus of softening on the ventricular surface of the thalamus just in front of the posterior commissure This is not visible macroscopically It forms a semicircular area about 1 cm long in the antero-posterior direction, extending about 6 mm outwards into the thalamus No other foci of softening found The cortex in all areas examined, the brain-stem and cerebellum are microscopically normal, except for vascular congestion

Dr Greenfield, on examination of his sections again, wrote that he thought there was enough thickening of the small arterioles to account for the softenings that were present There was no softening or other abnormality round the aqueduct in the upper end of the midbrain, nor was there any evidence of capillary and endothelial hyperplasia such as one sees in Wernicke's encephalopathy He added "I should therefore class the case as one of cerebral arterial disease of unusual localisation"

DISCUSSION

The predominant symptoms of the case—lethargy, oculomotor palsy with ptosis—resembled those of acute encephalitis lethargica, but the post-mortem findings show that these symptoms were really due to an arteriolosclerotic change in the basal ganglia of the brain, with resulting areas of ischæmia and hæmorrhage There was nothing to suggest a toxic or infectious ætiology, blood diseases, trauma, carbon monoxide poisoning, alcoholism and burns could be excluded As Dr Greenfield pointed out, there was no softening or other abnormality round the aqueduct in the upper part of the mid-brain, nor was there any evidence of capillary and endothelial hyperplasia such as is met with in Wernicke's encephalopathia For our case and similar ones we think we are justified in suggesting the use of the term Encephalopathia arteriolosclerotica basalis lethargica It is a purely descriptive term, taken partly from the morbid histology and partly from the clinical aspect of the disease If preferred, instead of the clinical epithet "lethargica," the pathological epithets "ischæmica et microhæmorrhagica" might be substituted

REFERENCES

Campbell A C P and Biggart J H (1939) *J Path Bact* 48 245
Economo C (1917a) *Wien klin Wschr* 30, 581, (1917b) *Neurol Zbl* 36 866
Mauthner, L (1890) *Wien med Wschr* 40, 961, 1001, 1049 1092 1144, 1185
Wernicke C (1881) Lehrbuch der Gehirnkrankheiten Kassel, vol ii p 229

FOOD UNDER FIVE

Between the ages of one and five the human young should properly take a keen interest in food Unfortunately he does not conscientiously seek what he may devour he devours what he can get With a little tact however, the two can be made to coincide, and in order to help those who have charge of young children the Ministry of Health has prepared a memorandum ("The Feeding of Children from One to Five Years" H M Stationery Office 4*d*) in which such tactful feeding is discussed Suggested menus for 22 days do not overlook war-time handicaps, but give due prominence to salads, vegetables and milk Those under five like puddings too, and puddings are usual as a second course for the midday dinner, the first course being fish, stews, cheese or cheese dishes, Scotch broth or vegetable soup, bacon, stoved potatoes or sea pie Recipes for the suggested dishes fill several inviting pages A Medical Research Council note on vitamins and cooking appears as an appendix

In the light of such contradictory evidence it seemed important to investigate under well-controlled conditions the effect of aneurine on the blood-sugar of diabetics, with and without the addition of insulin, and to analyse statistically the blood-sugar curves

EXPERIMENTAL

A series of 32 middle-aged patients suffering from mild diabetes were chosen for the tests They were all on a standard Joslin's diet, most of them without previous insulin treatment These patients were divided into two groups, of 20 and 12 respectively In the first group the effect of aneurine was examined on the fasting level of blood-sugar, and in the second group the combined action of aneurine and insulin was investigated The blood-sugar determinations were performed by the method of Hagedorn and Jensen (1923) The experiments were always timed from 8 A M to 10 A M

Effect of aneurine on blood-sugar in diabetics—The values for the fasting blood-sugar in 20 diabetics were first ascertained, and then 2 mg of aneurine ('Berneiva,' Roche) was injected intravenously Blood samples were analysed 30, 60 and 120 min after the injection, while the patients remained without food (table I) The fasting levels of blood-sugar of normals and diabetics without any treatment do not change appreciably during such a short experimental period If no significant difference in the individual means of the time curve were observed after injection of aneurine, it could be concluded that this was sufficient proof of the inefficiency of aneurine in decreasing blood-sugar in diabetics, at least in a short-time experiment

The individual curves of the patients varied greatly both in shape and in fasting values Fisher's (1938) analysis of variance was found to be the most suitable way of treating these results statistically, the essential data for these calculations are given in table I The mean square between times (v_1 = 1958 6) and the mean square for error (v_2 = 1289 9) provide a basis on which to evaluate whether the changes of the blood-sugar values of the time curve (v_1) are significantly different from the error (v_2) of the experiment The tabulated 5 pt value of z for this particular case is approximately 0 5 (for degrees of freedom 3 and 57), which is greater than the value obtained from the analysis of variance (z = 0 209) We can therefore conclude that the difference between times is not significant and that the variations of the blood-sugar are within the error of observation As a check on these statistical calculations the standard error of the mean for 20 patients was calculated (± 8 03) When compared with the observed differences between two means—namely, the mean of the initial blood-sugar values with the other means of the time curve (see table I)—the difference was not significant, being smaller than twice the standard error of the mean

Combined effect of aneurine and insulin on blood-sugar level—In the second group the fasting blood-sugar of 12 patients was examined, then their response to 20 I U of insulin was determined during the next 2 hours (table II) The third day after these control tests a similar experiment was performed with the same patients, but an intravenous injection of 2 mg of aneurine was combined with a subcutaneous dose of 20 I U of insulin (table III) The differences between the two sets of results were calculated and the main difference statistically analysed, the variance technique being employed as in the previous section Table IV shows that the mean difference between the blood-sugars with and without aneurine does not differ significantly from zero in any of the four groups or for the data as a whole, for no mean is as much as twice its standard error

DISCUSSION

It is evident from the results that aneurine either alone or in combination with insulin does not exert any influence on the blood-sugar of diabetic patients, at least in such a short-time experiment That more prolonged administration of aneurine is also ineffective is suggested by the fact that 10 mg given daily for 4 weeks to 2 diabetics did not improve their sugar-tolerance or insulin requirement These results do not support the view that there is any direct interconnexion between the disease and aneurine requirements, and they do not justify the use of aneurine in diabetes for the purpose of increasing the sugar-tolerance On the other hand, diabetic diets may be often low in vitamin B_1, so that a partial deficiency of vitamin B_1 which would require treatment with aneurine is likely to be an incidental accompaniment of diabetes

SUMMARY

The effect of aneurine on the blood sugar was studied in 32 diabetics, and the results statistically evaluated

Aneurine does not affect the fasting blood sugar values or increase the response to insulin of diabetic patients

These findings suggest that the use of aneurine to increase the sugar-tolerance in diabetes is not justified

I wish to thank Dr J O Irwin for his advice on statistical calculations, and Dr L J Harris for his inte and criticism Roche Products Ltd generously suppli pure vitamin B_1

REFERENCES

Beckert, W (1938) *Med Klin* **34**, 1505
Bell, M E (1931) *Biochem J* **25** 1755
Burke, J C and McIntyre, A R (1938) *J Pharmacol* **64**, 46 (1939) *Ibid*, **65**, 36
Desgrez, A, Bierry, H and Rathery, F (1923) *C R Acad Sc Pari* **117**, 795
Drigalski, W (1935) *Arch VerdauKr* **57**, 1
Eggleton P and Gross, L (1925) *Biochem J* **19**, 633
Fisher, R A (1938) Statistical Methods for Research Worke Edinburgh, p 216
Funk, C and Schonborn, E (1914) *J Physiol* **48**, 328
Gottlebe, P (1938) *Klin Wschr* **17**, 755
Hagedorn, H C and Jensen, B N (1923) *Biochem Z* **135**, 46
Harris, L J (1938) Vitamins and Vitamin Deficiencies, Londo vol I
Jonata, R (1931) *G Clin med* **12**, 159
Joslin, E P (1940) Treatment of Diabetes Mellitus p 25
Kodicek E and Joachim, J (1935) *Z Vitaminforsch* **4**, 250
Krebs, H A (1941) *Nature, Lond* **147**, 560
Labbé, M, Nepveux, F and Gringoire, J D (1933) *C R Soc Biol Paris* **113**, 152
Lajos, S (1936) *Biochem Z* **284**, 279
Lepkowsky, S, Wood, C and Evans, H M (1930) *J biol Chem* **87**, 239
Lewinson, M S (1937) *Z Vitaminforsch* **6**, 209
Lohmann, K and Schuster, P (1937) *Naturwissenschaften*, **25**, 26
Martin, R W (1937) *Hoppe Seyl Z* **248**, 212
Mosonyi, J and Aszodi, Z (1938) *Klin Wschr* **17**, 337
Ochoa, S (1940) *Nature, Lond* **146**, 267
Owens L B, Rockwein, S S and Brown, E G (1940) *Arch intern Med* **66**, 679
Peters R A (1940) *Nature, Lond* **146**, 387
Priesel R and Wagner, R (1930) *Fortschr Ther* **6**, 492
Randoin, L and Lelesz, E (1926) *Bull Soc Chim biol Paris* **8**, 15
Schroder, H (1937) *Z exp Med* **101**, 373
Smith, B F and Mason, H L (1940) *Proc Mayo Clin* **15** 599
Stucky, C J and Rose, W B (1929) *Amer J Physiol* **89**, 1
Tislowitz, R (1937) *Klin Wschr* **16**, 226
Usuki, H (1936) *Nagoya J med Sci* **10** 343
Vorhaus, M G, Williams, R R and Watermann, R E (1935) *Amer J digest Dis Nutrit* **2**, 541
Williams R R and Spies, T D (1938) Vitamin B_1 and its Use in Medicine, New York, p 72

NOTES ON TRICHLORETHYLENE ANÆSTHESIA

H F GRIFFITHS, M D CAMB, D A
ANÆSTHETIST, EMS

It was originally intended to submit a large number of cases in which trichlorethylene ('Trilene' ICI) had been used as an anæsthetic to detailed analysis, but circumstances have rendered this impossible The administration of this drug to some fifty patients has, however, led to certain conclusions which may be worthy of record These cases range from laparotomy to dilatation and curettage and provide a fair cross section of surgical cases Ages ranged from 5 to 68 years Trilene is a purified form of trichlorethylene to which a small quantity of a stabilising agent has been added Its properties have been reviewed by Hewer and Hadfield[1] It is non-explosive, easy to administer, and in my experience safe Premedication used was 'Omnopon' gr 1/3 and scopolamine gr 1/150 except for children, and the apparatus a standard Boyle's machine with the trilene used in the chloroform bottle Induction was in all cases smooth and easy, and coughing and struggling conspicuously absent Relaxation was good except in one case where ether had to be used in addition A point worth noting is that respiration becomes very shallow or ceases if the trilene is pushed too rapidly, but has soon started again after administration of CO and oxygen This respiratory depression may possibly

---

[1] Hewer, C L and Hadfield C F *Brit med J* [illegible] ii, 924

THE LANCET

LONDON SATURDAY, APRIL 25, 1942

MALARIA AND INVASION

On another page we review the report of the India branch of the Ross Institute which reflects the highest credit on the directors, managers and staffs of the tea and other industries which support the branch and its work Not least does it reflect credit on Dr G C Ramsay, his European and Indian colleagues, and the large staff of laboratory and field technicians In many parts of India the prevention of malaria has advanced so far that it could not conceivably ever be abandoned by the governments or by the industries it has benefited It shows what cooperation between Europeans and India can achieve, a noble gift from Ronald Ross, by race a European, by birth an Indian But with a barbarian army on the threshold we are bound to consider how invasion might reactivate the malaria problem In much of Assam, particularly along the foot of the Himalayas, malaria and blackwater fever have been a scourge not less severe than in West Africa The bed of this great valley is flat The melting snows of Tibet rush down through he Himalayas into the Brahmapootra, a river 5 to 7 miles wide, and fill it to overflowing The monsoon ains add their quota, some 100 inches in six months, and the Assam valley becomes almost a lake during he malaria season Nevertheless, as Sir Malcolm Watson has pointed out, the flooded areas are practically free from malaria Ramsay proved that here malaria was carried almost exclusively by *Anopheles minimus*, a mosquito which lives in grassy sunlit streams and clear water wells, but not in shade Ramsay also showed that the mosquito was not found in jungle, but comes in when jungle is cleared The artificial shade of a duranta hedge over a stream is thus an effective anti-malaria measure, there are thousands of miles of such hedge in India, and unless the Japanese deliberately destroyed the shade, invasion would not increase the malaria In other parts of Assam where control depends on oiling or flushing the danger would be greater Fortunately the defenders will have the services of medical men completely conversant with malaria control Bengal is largely the delta of the Ganges and the Brahmapootra, as Holland and Belgium are the delta of the Rhine The Dutch made their land by reclaiming it from the sea and the more embanked the freer it is from malaria Bengal has been embanked to prevent flooding, from the rivers by the British, from the sea by the Bengalese Unfortunately under tropical conditions both forms of embankment have produced malaria so intense that huge areas have been depopulated and abandoned to the jungle and the leopard Eastern Bengal with fewer embankments enjoys vastly greater freedom from malaria It was C A Bentley who most fully realised the risk of embankments and strove to get gates opened through them, in order to flush the land and replenish the dried-up rivers A "scorched earth' policy, if the name can be misapplied to cutting embankments and flooding land, might destroy many lives by drowning but perhaps fewer than have fallen to malaria Many of the rivers might find new courses, changing the face of the land and the ways of the people, the change might be for the good of the soil and the welfare of the people

PROGRESS IN BURN THERAPY

In the whole of the last war The Lancet published but one original article on burns—that by Wakeley in 1918 on skin-grafting It is the modern methods of warfare, and especially of air-warfare, which as Vaughan Hudson[1] puts it have raised burns from small to large type This time the technique of treatment has evolved rapidly under a storm of controversy, and we have seen the establishment of burns units, changes in the design of aircraft for the protection and easier escape of the crews, the adoption of effective and comfortable anti-flash outfits for naval gun-crews, and important EMS directions for first-aid and local treatment of burns, besides great additions to our knowledge of their biochemistry The first and most important problem is still the saving of life, and here the use of plasma is one of the outstanding advances of the war, making it possible to save life when up to two-thirds of the body-surface is burnt Large amounts of plasma may be needed, for not only is there external serum loss but still larger quantities may be lost from the circulation by accumulation in the burnt tissues—thus a second-degree burn from the knee downwards may gather 3 pints of extra fluid in that area According to Bettman[2] 40% of the total fluid shift takes place in the first hour and 60% of the deaths occur in the first 24 hours Early and rapid restoration of the fluid balance is therefore required The concentration of hæmoglobin is the most useful way of following the restoration of blood-volume, but it is not an absolute guide Wolfe and Clegg,[3] for example, found that a burnt patient with hæmoglobin of 162%, who according to Black's method of calculation required 1900 c cm of plasma, did not regain his normal hæmoglobin percentage until he had had 4450 c cm over three days They also observed that when the plasma had been given œdema almost disappeared within 12 hours, and since for burns of the hands and face absorption of œdema is particularly important it may be advisable in such cases to give serum or plasma even when the general condition does not seem to demand it Others have reduced local œdema within a few hours by giving concentrated serum, though they have not yet published their results. It is important, too, to keep up the administration of plasma or serum for some days, especially when sepsis supervenes and there are large discharging areas Estimation of blood protein is apparently not a reliable guide to serum needs in these cases

Views differ about the importance of checking external fluid loss by sealing the surface with coagulants Wallace[4] says that from an untreated second-degree burn involving a sixth of the body surface a man may lose 3½ litres of serum out of a total blood-volume of 5 litres within 24 hours, and no-one will deny the fall in mortality after Davidson introduced tannic acid in 1925 Yet in Canada and the United States no such significance is attached to external fluid loss, and severe cases are treated in total

---

[1] At the meeting of the Medical Society of London on March 23
[2] Bettman A G *J Amer med Ass* 1942 118 344
[3] Wolfe H R I and Clegg, H W *Lancet* 1942 i, 191
[4] Wallace, A B Oxford War Manual, 1914, p 15

Reviews of Books

Four Treatises by Paracelsus

Editor HENRY E SIGERIST Baltimore Johns Hopkins Press Pp 256 $3

MOST men have been content to accept the verdict of his own generation on Theophrastus von Hohenheim, called Paracelsus—that he was an itinerant empirical physician, with a practical knowledge of pharmaceutics unusual at that time and imbued with a fantastic and mystical philosophy Bacon's condemnation of him in the "Novum Organon" contributed largely to the low esteem in which he has always been held in England, but in his own country he never lacked disciples Now, under the editorship of Professor Sigerist, himself one of the translators, four competent and erudite scholars of the history of the period have translated some of the treatises of Paracelsus into English These works did not find a publisher during his life, probably owing to opposition from the orthodox medical hierarchy whom he so bitterly attacked Paracelsus died, still vigorous in his reforming zeal, still inveighing against authority, in his forty-eighth year, and twenty years later his treatises began to appear in print, thanks to the ardour of his disciples But it is only in our own time that his importance as a physician has been recognised his mystical and often fantastic philosophy obscured his share in the rebirth of scientific investigation during the 16th century Though he was a rebel to the accepted medical doctrines of his time and became a ruthless and often coarse controversialist, these treatises throw new light on his personality He held the true physician to be a man who saw things for himself, putting no trust in traditional lore Long before experimental medicine, before even the researches of Vesalius, he insisted on the importance of actual contact with the diseases to which the bodies and minds of men were subject He dismissed tradition and book-learning as false and deceitful guides Observation, which he called experience, was to him the true road to skill in medicine, traditional lore led only to pretentiousness, covetousness and rascality Of his originality and his powers of accurate observation there can be no question He wrote the first treatise ever published on occupational disease—the ailments of miners He described accurately many of the symptoms of acute and chronic arsenical and mercurial poisoning, he wrote a clear account of some mental and (as we should say) psychological states He recognised the hysterical element in chorea major, and gave sensible directions for checking mass suggestion "I write of the crazy dance which the common man calls St Vitus' dance, also of those who kill themselves, also of false maladies which befall through sorcery as well as of people possessed" His somewhat barbarous German—he never used Latin, the language of scholars at that time—must have presented difficulties to the student for he was constantly inventing new names and new methods He triumphantly admits as much, he cannot avoid inventing terms, since he is describing what the medical hierarchy has hitherto ignored It is scarcely strange that a combative self-reliant, intensely observant man should have made enemies of the orthodox, that "self-schooled self-scanned, self-honoured,' he should have walked on earth unguessed at He founded no school of medical thought, he was in fact an empiric, he made no great contribution to knowledge, but his ideals have survived He takes his place among the physicians who prepared the way for the great awakening of the next two centuries

Diseases of the Eye

(2nd ed) *Text Book for Students and Practitioners* EUGENE WOLFF, M B Lond, F R C S London Cassell Pp 222 21*s*

A USEFUL chapter on eye-bandaging and nursing has been added, otherwise this manual retains the good features which made its predecessor a success The strong points are clarity and simplicity of both text and illustrations, and the drawings of anatomical dissections are specially good For the student or general practitioner wanting a general survey of ophthalmology the book is unequalled at present, although one or two points call for criticism—notably the chapter on albuminuric retinitis Surely the time has now come to class this condition with hypertensive changes in the retina, for it is not inflammatory and albuminuria is not necessarily present Malignant hypertension is given three lines under a separate heading, suggesting that it is a thing apart The pathology of detached retina is clearly set out, but it should be impressed upon the reader that the first thing to do on diagnosing the condition, and before operation is undertaken, is to put the patient at rest in the position which prevents the detachment from spreading In fig 5 the light might have been shown focused on the eye from the nasal side, since this makes for ease of examination Mr Wolff is a pathologist of repute, as well as an ophthalmic surgeon and his descriptions of morbid processes maintain the standard we have come to expect from him

Text-book of Pathology

(5th ed) SIR ROBERT MUIR, M D Edin, F R S London Edward Arnold Pp 991 35*s*

THIS new edition contains much fresh material in new photomicrographs, a remodelling of some of the sections and three pages less than the previous edition Most of the chief advances in pathology during the last five years are now included The relation of jaundice to coagulation of the blood, regional ileitis and Sheehan's work on Simmonds's disease are among the newer topics discussed with characteristic caution and judgment The author again stresses that the main function of the teacher of pathology is to explain general principles and the mechanism of pathological processes Readers will feel the lack of a bibliography the modern student wisely prefers to study rather than to be taught It is superfluous to commend a book which has served generations of Scottish students

Trauma and Disease

(2nd ed) Editors LEOPOLD BRAHDY, M D, SAMUEL KAHN, M D London Henry Kimpton *Pp* 655 35*s*

IN England a workman has only to establish precipitation, acceleration or aggravation by injury of a former disease and his disability is then treated in law as entirely due to his injury In some American states, however, it is necessary in law to determine what proportion of incapacity was inevitable from the disease and what proportion was due to the acceleration or aggravation by the injury American doctors have thus been stimulated to consider very closely the relationship of injury to disease In a typical case a man of 36 crushed his left index finger in a cash register, within a week the index and third fingers of the hand became cold, pale and ulcerated, and disability was long and serious The diagnosis was established as Buerger's disease, becoming manifest after the injury, but though this condition cannot be caused by trauma, trauma can aggravate it, as the case shows The book, then sets out to evaluate the rôle of trauma in the development and aggravation of disease, 24 contributors are responsible for the text, 18 of them physicians and they have completed their task well, drawing on their wide clinical experience and reviewing much of the continental and American published work The book does not pretend to be the last word on the subject it has been written to stimulate further observation and discussion Perhaps a young traumatologist may be somewhat depressed, in reading this book, to learn the full extent of his chosen clinical field, but experienced physicians and surgeons will welcome the solid material it offers

Aids to Obstetrics

(11th ed) LESLIE WILLIAMS, M D, M S Lond, F R C S, F R C O G London Baillière, Tindall and Cox Pp 238 4*s*

THIS latest edition of an old and trusty friend has been modernised and largely amended to bring it up to date In a small space is compactly crammed almost all that a student on the eve of his finals will need to know, and the volume being a small one can be slipped into a pocket, ready to improve a few spare moments in bus or train It was never intended to be a book of reference nor to supplement one, and if this is always borne in mind it is probably one of the best of this series of "Aids" The subject matter is concise and the clear-cut dogmatic style will be a relief to the confused student who has found himself non-plussed by the controversies in other textbooks Mr Williams, being an examiner of considerable experience, has known exactly what to include in the text for the man who must answer questions at an obstetric viva Illustrations are few but sufficient, and the teaching represents the best in conservative obstetrics mouse brain and enveloped in egg-yolk[4] or attenuated with bile,[5] and that present in the fæces of rat fleas [6] These vaccines may cause severe reactions in Europeans and in one trial of living murine typhus virus on 500 people in an asylum in Seville there was no evidence that the course of the epidemic had been influenced in any way There is always the possibility that such a vaccine used in a population infested with lice may increase the severity of the epidemic, for it is probable that the murine type may be converted into the exanthematic by louse passage from human to human Killed exanthematic rickettsia were first used in 1918 by DA ROCHA LIMA,[7] who found that some immunity was produced by repeated injections of phenolised emulsions of lice infected with *Rickettsia prowazeki* Following the same idea WEIGL[8] in 1930 tried carrying out immunisation on a larger scale by using the phenolised intestinal contents of lice infected per rectum with *R prowazeki* obtained from the brains of infected guineapigs This method necessitates a huge stock of lice which need a large staff of immune persons on whom they can feed The technique of injection is very delicate and between 200 and 300 lice are necessary to provide sufficient vaccine for one person, so this is an impracticable method of preparing vaccine for large-scale immunisation More recently it has been found that large quantities of rickettsia are produced in the lung following intranasal inoculation of mice and rats, and DURAND and GIROUD[9] have used this source to prepare a vaccine with exanthematic typhus rickettsia, and CASTANEDA[10] with the Mexican murine strain The vaccine which has given the most promise with regard to simpleness of production and minimum of reaction following injection has been evolved from the finding of COX[11] that the rickettsia grow in profusion in the yolk sac of developing chick embryos Pure suspensions of rickettsia are obtained from the yolk sac of infected eggs by differential centrifugation, and inactivation is carried out by the addition of phenol to 1% and formalin to 0 5% It is possible to provide 85–100 c cm , or sufficient for 25–30 people, from fourteen embryos [12] At the Sukum Laboratory, in the Caucasus, the Otto strain of exanthematic typhus rickettsia has been regenerated by passage from infected monkeys to normal monkeys by lice This strain has been used for tissue cultures and egg inoculation by Cox's method, and a vaccine has been made, three doses of which have been found to immunise guineapigs and monkeys

All these vaccines of killed rickettsia have been found to protect experimental animals against the disease but in man the results are not so satisfactory Weigl's vaccine has been used in Poland,[13] Slovakia[14] and Ethiopia,[15] where it appears to have been of considerable value In China[16] it was found that the Weil-Felix reaction was positive and specific typhus rickettsial agglutinins were present in the majority of sera of those recently inoculated but there was no parallelism or constancy between the titres of the respective antibodies However, the rickettsial agglutinins decreased more than did the proteus agglutinins Insufficient data are available on immunisation of human beings to judge the effectiveness of the mouse and rat lung preparations, but some individuals immunised by this method have suffered no ill effects when subsequently injected with living cultures of *R prowazeki* The test for potency of the yolk-sac vaccines made by Cox's method or variations of it usually consists of three doses of 1 c cm each injected intraperitoneally at weekly intervals in guineapigs weighing 300 or 350 g This will protect the guineapig against between 1000 and 10,000 infective guineapig doses of *R prowazeki* in the form of infected guineapig brain Since this is the same initial course of vaccine as suggested for human beings weighing 60 or 70 kg it is not hard to understand why serological evidence of the immunising value of this vaccine has been slow in coming The production of a positive Weil-Felix reaction and neutralising antibodies as tested by Giroud's intradermal rabbit test has been irregular in individuals inoculated from the same sample of vaccine There have been a number of laboratory infections with both exanthematic and murine strains of typhus in people who have had three or more injections of the vaccine sufficiently long beforehand for the expected development of immune bodies However, these workers have all been repeatedly exposed to high concentrations of the living rickettsia so it is not fair to judge the vaccine's effectiveness from this These three injections and repeated stimulating-doses at six months' intervals, as recommended by the American war department[17] for all troops going to typhus areas, may be the solution of the question, but there is little or no available evidence of its effectiveness in the field The only large-scale trial has been in Spain, where some 20,000 people had been inoculated when the Rockefeller workers left the country in 1941 before they were able to evaluate the effect of vaccination Many more people have been inoculated since then and Spanish medical opinion is that it has helped to control the spread of the disease The fact that this vaccine in relatively large doses has effectively immunised guineapigs suggests that the essential factor for better immunisation of human beings is a greater quantity of the killed rickettsial bodies, which will depend on improved methods of culture and refinement in methods of preparation Perhaps a strain of rickettsia will be evolved which it will be possible to use in the living state, as a result of attenuation either gradually during egg passage or suddenly as with the virus now used for yellow-fever immunisation The results of serological tests that have been done on individuals inoculated with killed rickettsia once more give rise to the question of the exact relation between the Weil-Felix reaction and immunity Experiments are necessary on a large scale to try and relate this reaction to actual production of neutralising antibodies

The Germans are using a vaccine, source unknown, which rumour has it produces sufficient reaction for army personnel to be rested the day of inoculation The Russians also are probably carrying out large-scale immunisation, and it would be interesting to know what are their methods and results The general impression is that large-scale immunisation is not practicable with the vaccine available in America and Great Britain, except for those in areas threatened by the disease and in a position to have repeated inoculations

---

1 *Ann epidem Rep Hlth Sect L o N* for 1938, III Hygiene p 60 —2 *Publ Hlth Rep, Wash* 1941 56 1934 —3 Mackenzie M D *Proc R Soc Med* 1941, 35 141 —4 Laigret J Durand R Belfort J and Lefaucheur J *Arch Inst Pasteur Afr N* 1937 26, 453 —5 Blanc G *Int Congr trop Med Amsterdam* 1938 I

Continued at foot of next page

saline baths **Berman**[5] has supported this view by demonstrating that severely burnt guineapigs recover if immersed in water, whether it be distilled, saline or tannic Over here some form of tanning is still preferred, for the total bath requires much skilled nursing and the dangers of subsequent sepsis are considerable Besides sealing fluid loss, tannic acid probably affects the absorption of toxic products An immediate tan with 10% silver nitrate and 5% tannic acid is becoming popular because it produces a rapid coagulum and avoids messy spraying and overheating As **Medawar**[6] points out, this is not tanning but silver-plating, a quick impermeable surface seal being produced by the precipitation of metallic silver **Wakeley** has obtained equally good results with gentian violet (triple dye), which has the advantage of simplicity but the disadvantage of requiring repeated application When he introduced tannic-acid treatment **Davidson** also introduced the principle of cleansing the burn and especially the surrounding areas from which infection comes This may have been the main factor in reducing mortality, though advocates of the Bunyan-Stannard technique have shown how, by open methods, preliminary cleansing can be dispensed with Nevertheless, to treat a burn without cleansing is to face inevitable infection, despite any form of antiseptic irrigation There must be cases where early cleansing is not possible or desirable, and here the Bunyan-Stannard methods come into their own Recently tanned areas should not be left to wallow amidst blankets teeming in streptococci and other organisms, they should be dusted with sulphanilamide, covered with gauze and lightly splinted to rest the part Elevation of burnt limbs is essential for promoting drainage through the lymphatic system In slighter lesions, where there is no fluid loss, simple cleansing, a suitable sulphonamide application and a non-adhesive sterile dressing give satisfactory results

Nine-tenths of burns are superficial, and we must not let the other tenth cloud our treatment of all cases Whatever we do some of these hands and faces desperately burnt by petrol and oil cannot recover. The scorched hands have been the main cause of concern in Service patients With tannic acid there were some appalling results, some probably made worse by bad splinting and bad treatment With saline baths and irrigation, and constant expert supervision, the results improved, though there were still some bad ones At Oxford the immediate application of plaster has been successful, and prolonged immobilisation, with constant care, has seemed no disadvantage Others think the time for plaster is later, when œdema has subsided, and till then use sulphanilamide, tullegras, light splinting, and high elevation The cardinal principle underlying all local treatment, as **Wakeley** was urging in 1918, is the prevention of scar-tissue proliferation by skin-grafting as soon as the dead tissues have separated, for as soon as epithelium covers an area fibroblast development ceases But hurrying the separation of dead tissues carries with it dangers—it takes time for a barrier to be built to seal off tendons and joints If by violent irrigation the slough is got away early there may as yet be no barrier and infection of an underlying joint or tendon may then be inevitable Moreover we need not to hurry the epithelium but to delay the fibroblast, whose growth may be stimulated by too early movement, over-splinting or passive stretching Frequent dressings, too, will tear tender tissues so that more scar-tissue is laid down To get the minimal scar we must combat sepsis and give maximal rest by minimal interference Perhaps we shall see more done in the prevention of keloid by early radiotherapy when the technique described in our issue of April 11 by **Levitt** and **Gillies** has been fully developed **Wakeley**[7] advocates the prolonged use of lanolin and massage as part of the after-treatment, and the application of superficial X-ray therapy at the earliest sign of keloid formation He would see a superficial X-ray therapy apparatus in every burns unit Radiotherapy can do much for the established keloid especially the red fleshy type, and **Gillies**[1] has lately shown what reconstructive surgery can do for some badly scarred faces and hands For the large bu area, as on the thigh, he urges that excision immediate skin-grafting should be practised often, nor is it necessary to wait until the scar fully contracted before beginning reconstructive surgery If this war has put burns at the head of th list of disabling and deforming injuries, then, at least it has stimulated counter measures What is most needed now is a frank record of the results of different methods of treatment

TYPHUS IMMUNISATION

Epidemic typhus, which has been one of the great scourges of mankind in periods of war and famine, continues to rear its head in Spain, the Balkans Germany, Poland and Russia Nearly 46,000 cases were reported in European Russia in 1936[1] over 4000 in Spain from January to June and 370 in July, 1941 and 1000 and 170 for the same periods in Germany[2] Though there are rumours that the disease is being spread in Germany by the return of infected soldiers from the Russian front it is impossible to obtain accurate information of the number of cases There as in most European countries, preventive measures are being thoroughly overhauled

There are various basic methods of combating the spread of exanthematic typhus It is essential to have a large number of personnel thoroughly trained in carrying out the delousing of human beings and their property It is also desirable, when possible to reduce malnutrition in the population, for **Mackenzie**[3] considers this more important than overcrowding in producing an epidemic in an endemic area These methods of attack are a heavy drain on the economic and food resources of both civil and military authorities in a country at war If a method of vaccination could be evolved which would immunise satisfactorily, then the trained personnel, already immune, could more easily deal with the delousing of the population until general immunisation could be carried out in the affected area Ever since the recognition of rickettsia as the causative agent of typhus fever attempts have been made to prepare a vaccine which would safely and effectively immunise against the disease Innumerable preparations from human beings, lice, guineapigs, mice and fleas have been tried Some have contained living rickettsia, such as the murine strain passed through subject of X-ray diagnosis It appears uncertain whether the proposed department will be allowed to form a complete unit of the hospital, with beds under the professor's own control

---

[5] Berman, J K Synopsis of the Principles of Surgery London, 1940, p 118 [6] Medawar, P B *Lancet*, 1942 i, 350

[7] Wakeley, C P G *Ibid*, April 4 1942 04

ACCURATE BLOOD-GROUPING

DETERMINING a person's blood group seems one of the simplest procedures of clinical pathology The patient's finger is pricked, a little blood is run into some citrate solution, the red-cell suspension is mixed on a slide with anti-A and anti-B test sera , if the cells are agglutinated by both the group is AB, if by neither it is O, if agglutination occurs with anti-A only the group is A, if with anti-B only it is B Yet in spite of this surface simplicity, mistakes and accidents keep happening, and with mistaken blood groups the results may be grim G L Taylor and his colleagues[1] at the Galton Laboratory, Cambridge, have proposed a technique which will give a high degree of reliability in the determination of these ABO blood-groups , the available knowledge of the snags of blood-grouping is combined with a scheme of which orderly method is the keynote It differs from the popular simple scheme in several ways First, both red cells and serum from each sample are grouped Either a citrated and a clotted sample can be taken, or one sample of clotted blood will do, since sufficient red cells can easily be obtained from the blood clot after removal of the serum For testing both sera and cell-suspensions of known groups are kept handy , the anti A and anti-B sera are of tested titre, are stored frozen solid in small containers and are diluted 1 2 for use , the cell-suspensions of known A or B cells are about 5% strength The reactions are carried out in small test-tubes, not on slides, and all negative results are checked by microscopic examination The reactions of the test cells and sera are always checked before use A specimen of blood is tested as follows 1 volume of serum is put into each of two test-tubes, diluted with 1 volume of saline, and 1 volume of suspension of A cells is added to one tube and B cells to the other , the unknown red cells are similarly added to diluted anti A and anti-B sera The tubes are capped, kept in the cold for 2 hours, and the results then read Workers should be in pairs, and an experienced pair can read the double tests on 100 samples in about half an hour Taylor and his colleagues also point out how the fallacy of reporting group A_2B as group B can be avoided by re-testing the serum of every reported group B against known A_2 cells , if there is a reaction, the group B is confirmed since the serum is thus shown to contain the antibody α which reacts with A_2 as well as with A_1 cells, so that the unknown blood cannot be either group A_1B or A_2B It is necessary to use A_2 and not A_1 cells since the serum of some A_2B persons contains the antibody α, which reacts with A_1 but not A_2 cells, hence if A_1 cells are used in such a case the reaction will incorrectly indicate group B No-one who has to determine blood-groups, whether on a large scale or only as occasion demands, should fail to digest the advice given in this paper

WHERE THE WASTE PAPER GOES

SOME hospitals have lately given their clinical records for salvage—Guy's, for instance, handed in 4½ tons of clinical and X-ray records—and though this may seem sacrilege the need justifies extreme measures Before the war most of the waste paper collected went to the manufacturers of corrugated paper, the cheaper wrapping papers and paper board, an important material used in making packing cases and containers, the shanks, stiffeners and insoles of boots and shoes, trunks and suitcases, insulating and wallboard for building, and in bookbinding The remaining and largest section of the paper industry relied on imported wood pulp, supplemented by a little pulp made from esparto grass and rags A great deal of both paper and board was imported ready made from Scandinavia, Finland and Holland, the United States, Canada and Newfoundland The German occupation of Norway immediately cut us off from the main source of supply of wood pulp—Scandinavia and Finland—and enemy activity in the Mediterranean, in conjunction with the need for conserving shipping, subsequently cut off supplies of esparto grass, which is obtained from North Africa Canada and the United States were left as the only producers of wood pulp from whom supplies could be obtained, and the United States normally used more than it makes The spread of the war has since made shipping space a primary consideration , imports are now small and likely to become still smaller Meanwhile our expanding munitions industry calls for more and more paper—for shell, bomb and cartridge containers, gun fuses, some of the working parts of mines, dust covers for aero-engines and the like Hence the need for making the best use of all home produced or home accumulated materials suitable for paper making Straw, rags, waste wood and hemp and jute bagging are being used as far as possible but they require special boiling plant which few mills possess This plant is being installed and extended, but the potential output of pulp from these sources is quite inadequate to maintain essential supplies As in the last war we have had to fall back on waste paper and this has the advantages that existing machinery can be adapted for reconverting it into pulp, that it consists almost entirely of good paper making fibre, that the basis of a nation-wide organisation for its collection already existed, and that there was a great deal of it The ink does not matter for most war-time purposes—it gets evenly distributed and produces the grey tint to which we are already accustomed in our cartons For whiter papers the ink must be bleached out or materials which have not been printed on must be used The inferior qualities of waste—cardboard, heavily printed and coloured paper—can quite well be made into board Most local authorities are compelled to provide a regular collecting service and they have so far collected 600,000 tons of waste paper All paper collected is graded by the merchants and local authorities and allocated to the mills which can make the best use of each grade by the Paper Control of the Ministry of Supply, and they also issue licences to consumers of finished paper and board

The Salvage Controller says there are still hundreds of thousands of tons of unwanted books and magazines lying about in our homes, and that business and professional men are still holding back old journals and other papers No doubt he is right, and we shall not have done our best to help the supply of munitions until we have yielded up every cardboard box, every old letter and every book and periodical that we can spare

TRANSMISSION OF CANCER BY SUCKLING

IN the early days of the Imperial Cancer Research Fund the then popular belief in the inheritance of cancer was examined critically and put to the test of experiment Familial incidence which had convinced many people of a heritable factor was reasonably explained by cancer being so widespread that few large families could escape Two or more members in the same or different generations or both might develop tumours in the same organ quite within the range of statistical probability Selective breeding from cancerous parents in mice on the other hand led Murray[1] to the conclusion that mice which had a recent cancerous ancestry, mother or grandmother or both, were three times as likely to develop mammary cancer as mice with healthy forbears In human cancer, inbreeding to this degree is so unlikely as to rule out heredity as a potent factor in carcinogenesis Probably for this reason Murray s work was not followed up for

---

[1] Taylor, G L Race R R Prior A M and Ikin, E W [illegible] Bact 1942, 54, 81

[1] Murray J A 4th scientific report of the Imperial Cancer Research Fund London, 1911

Annotations

TRANSFUSION AND SYPHILIS

WHEN large numbers of donors are being bled any medical practitioner is liable to find a positive Wassermann reaction in a patient who has recently given blood for transfusion This may give him anxiety But he should be aware that all the transfusion services have anticipated this possibility and have made sure that syphilis will not be transmitted in such circumstances The safeguards depend upon the use of the Wassermann or Kahn reaction, filtration of the plasma or serum, and the lethal effect of cold upon the treponema The following procedures were agreed upon by a committee of representatives of the civilian and military emergency blood transfusion services, after considering the opinions of those with experience in the various aspects of the subject When the donor s blood is to be used for whole blood transfusion it is not issued unless the Wassermann or Kahn test on the blood in each bottle is found to be negative If positive to either of these tests it is discarded While the test is in progress the bottle is stored at + 4° C and as the blood is rarely used within 24–48 hours the lethal effect of cold on the treponema provides an additional safeguard When the donor s blood is used for the preparation of plasma or serum the Wassermann or Kahn test is not necessarily performed The plasma or serum is pooled and during the processing the product is held for 60–80 hours at + 4° C After this it is filtered through a Seitz bacterial filter All experimental work indicates that the *Treponema pallidum* will not survive such long periods in the cold and the additional protection provided by filtration makes for absolute safety At the time of a donor s enrolment no routine Wassermann or Kahn test is made because it occupies much time and provides no complete safeguard since the donor may become infected between the time of enrolment and subsequent bleeding When a hospital relies on a small local panel for fresh blood transfusions, only reliable donors who are fully cognisant of their responsibility should be accepted and a Wassermann or Kahn reaction on enrolment then provides sufficient safeguard

MORE NURSING COMPARISONS

AMERICA is appealing for fifty thousand women between 18 and 35 to enrol as nurses[1] High-school education is required of candidates, college education preferred The shortage there, it seems, is of graduate nurses whom these student nurses are to supplement, with a prospect of good and satisfying careers later on The opportunities open to them range from bedside nursing to deanship of a university school of nursing, from service as a rural nurse to supervision of a state public health nursing service, from being hostess on an aircraft to directing three thousand nurses in municipal hospitals Professional opportunities for the nurse are thus much wider in America than here—a fact which many of our nurses now serving abroad with the Forces can hardly fail to appreciate Those in the Queen Alexandra's Imperial Military Nursing Service and the Territorial Army Nursing Service now hold commissions ranking as equivalent to lieutenant, major or higher Army ranks They are nowadays undertaking every possible branch of nursing, including the nursing of tropical diseases, and are working under medical officers who have qualified in Great Britain, the Dominions and the allied countries They share their mess with nurses trained in Poland and Palestine and are serving in combined hospitals with Indian, Burmese and Cingalese nurses All this must necessarily broaden their outlook and give them a wider conception of the scope of their profession Contact with nurses from the Dominions and the United States must be giving them insight into terms of service elsewhere and they can hardly fail to be discomfited by some aspects of the comparison Rates of pay conditions of training and status of the profession are better in those countries, moreover, the line is drawn much more firmly there between a state registered nurse and a nursing auxiliary without a qualification While we can still turn out the best practical nurses in the world other countries are steadily drawing ahead in establishing the dignity and advancement of the profession It is for our own nurses to see that the pace here is mended

---

[1] See *Medical Record*, 1942 155, 10

Continued from previous page

509 —6 Blanc G and Baltazard M *Rev Hyg* 1940 61 593 —7 Da Rocha Lima H *Münch med Wschr* 1918 65 1451 —8 Weigl R *Bull int Acad Cracovie Cl med* 1930 4 25 —9 Durand, P and Giroud P *Arch Inst Pasteur Afr N* 1940 29 25 —10 Ruiz Castaneda, M *Brit J exp Path* 1941 22 167 —11 Cox H R *Pub Hlth Rep Wash* 1938 53 2241 —12 Cox H R and Bell E J *Ibid*, 1940 55, 110 —13 Radlo P *Arch Inst Pasteur Afr N* 1937 26 667 —14 Drbohlav J *Bull Off int Hyg publ* 1938 30 317 —15 Mariani G *Ann Igiene (sper)* 1939 49 316 —16 Liu, P Y Zia S H and Wang K C *Proc Soc exp Biol N Y* 1938, 38, 682 —17 War Department Circular 1942 No 4, Section 3

VARRIER-JONES MEMORIAL LECTURES

AT the time of his sudden death last year Sir Pendrill Varrier-Jones was promoting a course of lectures by eminent authorities on various aspects of medical and surgical tuberculosis, including early diagnosis, aftercare and rehabilitation It is now proposed that part of a memorial in his honour should take the form of realising this scheme and it is thought that the most practical method would be for such lectures to be given at Service hospitals, particularly at those where medical and surgical conferences are already being held from time to time After the war the intention is for the lectures to be given both at Papworth and at the principal medical centres A memorial fund has been opened and subscriptions, marked Varrier Jones Memorial Fund should be sent to the secretary, Papworth Village Settlement, Cambridgeshire In the meantime commanding officers of Service hospitals who wish to have such lecture given should send a request to the secretary

A LONDON SCHOOL OF RADIOTHERAPY

THE day is long past when anyone with an elementary knowledge of electricity could buy the appropriate apparatus and start practice as a radiotherapist The potencies for good and evil in a modern X-ray plant are very great, and to obtain the benefits without the drawbacks an intimate knowledge of certain physical and biological problems is demanded, and no one can have this knowledge unless he has undergone a specific and detailed training The would-be radiologist needs a high standard of clinical wisdom and ability, in addition he will have to master the intricate physical and biological aspects of radiation before he can safely and beneficially practise his intended branch of medicine Such a prospect will discourage all but the keenest men, and this no doubt explains the dearth of accomplished radiotherapists in the country One method of facilitating the embryo radiologist's progress to a diploma and specialist practice would be to provide him with a school of radiology wherein he may have the best opportunity for adequate instruction, and it is depressing to admit that in London no such school exists or has existed except during the five years or so from 1932 onward during which a complete course for radiological students was provided at the Royal Cancer Hospital (Free) under Prof Woodburn Morison Happily there is a prospect that a school will soon be established by the authorities of the Middlesex Hospital, and it will be under the control of a teacher with the status of a professor of the University of London In this school there will be provision for the study of the physics of radiation and of the uses of radiation in therapy Presumably there will be instruction also in the important subject of X-ray diagnosis. It appears uncertain whether the proposed department will be allowed to form a complete unit of the hospital, with beds under the professor's own control.

ACCURATE BLOOD-GROUPING

DETERMINING a person's blood group seems one of the simplest procedures of clinical pathology. The patient's finger is pricked, a little blood is run into some citrate solution, the red-cell suspension is mixed on a slide with anti-A and anti-B test sera; if the cells are agglutinated by both the group is AB, if by neither it is O, if agglutination occurs with anti-A only the group is A, if with anti-B only it is B. Yet in spite of this surface simplicity, mistakes and accidents keep happening, and with mistaken blood groups the results may be grim. G. L. Taylor and his colleagues[1] at the Galton Laboratory, Cambridge, have proposed a technique which will give a high degree of reliability in the determination of these ABO blood-groups; the available knowledge of the snags of blood-grouping is combined with a scheme of which orderly method is the keynote. It differs from the popular simple scheme in several ways. First, both red cells and serum from each sample are grouped. Either a citrated and a clotted sample can be taken, or one sample of clotted blood will do, since sufficient red cells can easily be obtained from the blood clot after removal of the serum. For testing both sera and cell-suspensions of known groups are kept handy; the anti-A and anti-B sera are of tested titre, are stored frozen solid in small containers and are diluted 1 : 2 for use; the cell suspensions of known A or B cells are about 5% strength. The reactions are carried out in small test tubes, not on slides, and all negative results are checked by microscopic examination. The reactions of the test cells and sera are always checked before use. A specimen of blood is tested as follows: 1 volume of serum is put into each of two test-tubes, diluted with 1 volume of saline, and 1 volume of suspension of A cells is added to one tube and B cells to the other; the unknown red cells are similarly added to diluted anti-A and anti-B sera. The tubes are capped, kept in the cold for 2 hours, and the results then read. Workers should be in pairs, and an experienced pair can read the double tests on 100 samples in about half an hour. Taylor and his colleagues also point out how the fallacy of reporting group A_2B as group B can be avoided by re-testing the serum of every reported group B against known A_2 cells; if there is a reaction, the group B is confirmed since the serum is thus shown to contain the antibody α which reacts with A_2 as well as with A_1 cells, so that the unknown blood cannot be either group A_1B or A_2B. It is necessary to use A_2 and not A_1 cells since the serum of some A_2B persons contains the antibody α', which reacts with A_1 but not A_2 cells, hence if A_1 cells are used in such a case the reaction will incorrectly indicate group B. No one who has to determine blood-groups, whether on a large scale or only as occasion demands should fail to digest the advice given in this paper.

WHERE THE WASTE PAPER GOES

SOME hospitals have lately given their clinical records for salvage—Guy's, for instance, handed in 4½ tons of clinical and X-ray records—and though this may seem sacrilege the need justifies extreme measures. Before the war most of the waste paper collected went to the manufacturers of corrugated paper, the cheaper wrapping papers and paper board, an important material used in making packing cases and containers, the shanks, stiffeners and insoles of boots and shoes, trunks and suit-cases, insulating and wallboard for building, and in book-binding. The remaining and largest section of the paper industry relied on imported wood pulp, supplemented by a little pulp made from esparto grass and rags. A great deal of both paper and board was imported ready made from Scandinavia, Finland and Holland, the United States, Canada and Newfoundland. The German occupation of Norway immediately cut us off from the main source of supply of wood pulp—Scandinavia and Finland—and enemy activity in the Mediterranean, in conjunction with the need for conserving shipping, subsequently cut off supplies of esparto grass, which is obtained from North Africa. Canada and the United States were left as the only producers of wood pulp from whom supplies could be obtained, and the United States normally used more than it makes. The spread of the war has since made shipping space a primary consideration; imports are now small and likely to become still smaller. Meanwhile our expanding munitions industry calls for more and more paper—for shell, bomb and cartridge containers, gun fuses, some of the working parts of mines, dust covers for aero engines and the like. Hence the need for making the best use of all home-produced or home accumulated materials suitable for paper making. Straw, rags, waste wood and hemp and jute bagging are being used as far as possible but they require special boiling plant which few mills possess. This plant is being installed and extended, but the potential output of pulp from these sources is quite inadequate to maintain essential supplies. As in the last war we have had to fall back on waste paper, and this has the advantages that existing machinery can be adapted for reconverting it into pulp, that it consists almost entirely of good paper-making fibre, that the basis of a nation-wide organisation for its collection already existed, and that there was a great deal of it. The ink does not matter for most war time purposes—it gets evenly distributed and produces the grey tint to which we are already accustomed in our cartons. For whiter papers the ink must be bleached out or materials which have not been printed on must be used. The inferior qualities of waste—cardboard, heavily printed and coloured paper—can quite well be made into board. Most local authorities are compelled to provide a regular collecting service and they have so far collected 600,000 tons of waste paper. All paper collected is graded by the merchants and local authorities and allocated to the mills which can make the best use of each grade by the Paper Control of the Ministry of Supply, and they also issue licences to consumers of finished paper and board.

The Salvage Controller says there are still hundreds of thousands of tons of unwanted books and magazines lying about in our homes, and that business and professional men are still holding back old journals and other papers. No doubt he is right, and we shall not have done our best to help the supply of munitions until we have yielded up every cardboard box, every old letter and every book and periodical that we can spare.

TRANSMISSION OF CANCER BY SUCKLING

IN the early days of the Imperial Cancer Research Fund the then popular belief in the inheritance of cancer was examined critically and put to the test of experiment. Familial incidence which had convinced many people of a heritable factor was reasonably explained by cancer being so widespread that few large families could escape. Two or more members in the same or different generations or both might develop tumours in the same organ quite within the range of statistical probability. Selective breeding from cancerous parents in mice on the other hand led Murray[1] to the conclusion that mice which had a recent cancerous ancestry, mother or grandmother or both, were three times as likely to develop mammary cancer as mice with healthy forbears. In human cancer, inbreeding to this degree is so unlikely as to rule out heredity as a potent factor in carcinogenesis. Probably for this reason Murray's work was not followed up for several years The history of cancer research teaches however that no fact, if it be a fact, is so odd, so unusual or so trivial that it can be ignored without loss to our insight, and in his story of subsequent research into cancer of the breast Gyé[2] has verified this maxim Although heredity may not play a large part in contributing towards cancer as a whole, its influence cannot be neglected Following Murray's work, Loeb and others in America proved that by inbreeding from cancerous mice comparatively pure lines could be obtained having a high incidence of mammary cancer This inherited quality was dependent upon ovarian secretion because, if the ovaries of the young mice were removed before they were 3 months old, the incidence was much diminished The ovarian influence was next shown by Lacassagne to hold even in male mice provided they had a cancerous ancestry among the females of the strain Œstrin alone without the existence of inherited susceptibility among the treated mice did not raise the incidence in either males or females Thus it appeared that mammary cancer was dependent upon two factors working together, an inherited susceptibility and the action of the ovarian hormone The sequence was however disturbed by the demonstration that the inherited susceptibility appeared to be derived exclusively from the mother Hybrid mice, the progeny of high cancer strain mothers and low cancer strain fathers, retained the high cancer rate undiminished, but low cancer strain mothers and high cancer strain fathers produced young giving a low cancer rate when they matured Thus the maternal influence was predominant Finally this influence was proved to reside in the mother's milk When nursling mice from a high cancer line were fostered by mothers of a low cancer line, the incidence of mammary cancer fell When care was taken to prevent any contamination of the young by their mothers, the incidence fell to zero The influence, whatever it was, failed to be transmitted by inheritance or to pass through the placenta Succeeding generations bred from these uncontaminated fostered mice also had a low cancer incidence A high cancer rate could be restored at any time to the progeny by allowing them to have milk from high cancer strain mothers The same factor which is carried in the milk can be obtained from blood, from internal organs and from spontaneous tumours J J Bittner, the discoverer of the milk factor, has reached the provisional conclusion that it is a virus Here for the moment the story of mammary cancer ends in the quite unexpected support which it offers to the virus theory of the cause of cancer This valuable new technique for investigating the problem of cancer is being widely exploited now in many laboratories, and more is likely to be heard of it

---

[1] Taylor, G. L., Race, R. R., Prior, A. M. and Ikin, E. W. 1942, 54, 81.

[1] Murray, J. A. 4th scientific report of the Imperial Cancer Research Fund. London, 1911.

YARDSTICKS FOR MOTHER WIT

INVITED to discuss the testing of intellectual capacity in adults, speakers at the section of psychiatry of the Royal Society of Medicine, on April 14, found themselves tangled in a vocabulary test at the outset What is this intellectual capacity ? Mr J C Raven distinguished it from mere retentivity and quoted Spearman's definition of it as "the ability to reason by analogy from awareness of the relations between experienced characters"—no easy thing to measure, even if it remained constant in every subject or in every phase of his activity, which no-one seemed to think it did Commander C G Tooth, brushing aside definitions called it "mother wit," which by traditional association locks intellectual capacity with personality and thus carries a clearer meaning He also knew exactly what kind of test of it would be welcome in the Navy one which could be given as a group test, by people without knowledge of psychiatry, and completed in 20 minutes No-one seemed inclined to indulge him with suggestions, indeed much of the discussion dealt with what tests would not do, rather than with what they would Dr Noel Burke pointed out that no test has been devised which can be solved in one way only—that is, by any single intellectual approach or process Dr C J C Earl remarked that, far from measuring intelligence, existing tests only indicated the level of organised behaviour in a standard situation, decisions about a man's intellectual capacity could only be made on the basis of all the evidence available, *not on the results of tests alone* Dr F J S Esher had found progressive matrices a practical preliminary test for psychoneurotic soldiers who seemed dull and backward when admitted to hospital Later he gave Terman's tests, Passalon, Koh's blocks and other tests, offering as wide a series as possible so as to give scope to special aptitudes Mr Raven thought non-verbal tests more reliable than verbal, though group verbal tests were useful in assessing whether instructions were understood and whether men wrote a legible hand Capacity for leadership, he said, depends on the power to make quick, clear, accurate judgments based on sound knowledge, and men can be given a chance to acquire this, thus they can be tested before a course of training and given a different test of the same type after the course, to see how their rate of performance changes All agreed that intellectual capacity is only one component of the whole personality and cannot be separated from it, even in a test situation Thus the rate at which a man can see relationships and reason from analogy depends not only on his intellectual capacity but on his fund of information, which in turn depends on memory, experience, education, age, and (coming full circle) intellectual capacity Moreover, his performance may vary with his health, mood, temperament and opinion of the tester At best it is only possible, as Dr Earl put it *to get a rough measure of general intelligence*, because intelligence is not a unit variable In any case, we want to be able to tell not only how intelligent a man is but how he is intelligent, how his capacity and his personality interlock A psychiatrist conducting a test—particularly a performance test—has a chance to do this, he can see where the subject abandons *reason for trial and error*, whether he is put off by novelty or difficulty, whether he is excitable or inhibited, careless or overcareful, unwilling to try or futilely persistent, and how he responds to success and failure And more psychiatrists might be trained to do this True it takes time, but when it is a question of shutting up one man in an institution or sending another to a position of responsibility, Dr Earl suggests that two hours is hardly too much to spend in answering it It is disconcerting to find that, in spite of all tests, the psychiatrist is ultimately expected to use his clinical judgment—a demoded entity deriving almost entirely from mother wit

ELIMINATION OF TRICHINÆ

HITHERTO the only sure method of killing the trichinæ in pork has been thorough cooking, the process to which canned pork is subjected is said to eliminate all risk, whereas curing *alone does not* The United States department of agriculture has lately shown (*Science*, 1942, **95**, 14) *that freezing can be equally effective* Sections of meat not more than 6 in thick can be freed of parasites by being kept at 5° F for twenty days, at –10° F for ten days, or at –20° F for six days Thicker pieces require longer freezing The department points out that in many cold storage plants the temperature is not low enough to ensure a complete kill of trichinæ

NAVAL MEDICAL COMPASSIONATE FUND—A meeting of subscribers will be held at 3 P M on May 1, at the Medical Department of the Navy, 64, St James's Street, London, S W 1, to elect six directors

---

[2] Gye, W E 39th annual report of the same, just appeared

Special Articles

DIRECT-READING PHOTOELECTRIC COLORIMETER

EARL J KING, M A , PH D TORONTO
EADER IN PATHOLOGICAL CHEMISTRY IN THE UNIVERSITY OF LONDON
(British Postgraduate Medical School and
EMS Pathological Service, Sector 6)

A LARGE proportion of modern microanalytical rocedure depends on the production of a colour The ssessment of this colour, which gives the measure of the mount of the substance present, has usually been made y means of a Duboscq colorimeter or a photometer These instruments are now giving place to photoelectric olorimeters, which estimate the intensity of colour in a olution by measuring photoelectrically the proportion f incident light which is absorbed by the coloured olution Typical instruments are the Evelyn (1936), he Hilger (1936), and the Summerson (1939) When ight falls on a photoelectric cell the current generated can be measured by connecting the cell to a galvanometer The degree of deflection of the galvanometer needle depends on the amount of current generated, and this depends on the amount of light falling on the photoelectric cell If a coloured solution is interposed between the source of light and the photoelectric cell some of the light is absorbed, less electricity is generated and a smaller deflection of the galvanometer takes place A more strongly coloured solution will absorb more light, still less electricity will be generated, and the deflection will be still smaller The degree of deflection of the galvanometer, therefore, can be used to give us a measure of the intensity of colour in the solution, and hence of the concentration of the substance being analysed

The instrument here described makes use of this simple principle It has been in use for routine and research in these laboratories for two years and has largely displaced the visual comparison colorimeters formerly in use Some of the advantages of photoelectric colorimetry over visual colorimetry are the much greater speed and ease of colour measurement, and the elimination of eye fatigue and personal error

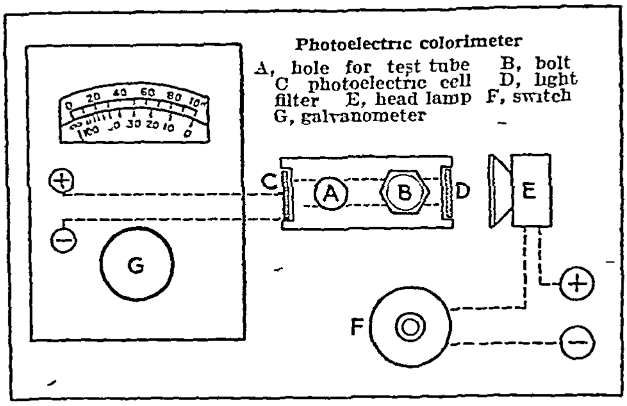
CONSTRUCTION

The construction and assembly of the instrument are illustrated in the diagram An ordinary surgical head lamp (Ever ready) furnishes the source of light (E) The bulb is activated from an accumulator, which ensures that a steady, non fluctuating, light is obtained Immediately in front of the lamp is mounted a block of wood (well seasoned teak or oak 3 × 3 × 2 in) which has been bored vertically to fit a $\frac{5}{8}$ in test tube (A) and a $\frac{1}{2}$ × 2 in metal bolt (B) whose nut is countersunk in the block The bolt, which should fit its hole tightly, is used to vary the size of the slot through which the light passes The slot is made by boring a $\frac{1}{2}$ in hole from front to back, cutting through the vertical holes, and then sawing up from the bottom of the block to make the slot $\frac{1}{2}$ in wide by $1\frac{1}{2}$ in high At the front of the block a groove is made 1 in wide and $\frac{1}{8}$ in deep to carry a light filter (D) A similar groove $\frac{7}{8}$ in wide is made at the back of the block to fit the photoelectric cell (C) The block is mounted on a 3 × 5 in piece of wood, and the $\frac{5}{8}$ in hole is extended $\frac{1}{4}$ in into the second piece so that the end of the test tube drops below the bottom of the slot

The photoelectric cell is of the selenium type, 22 × 40 mm The 'EEL' electroselenium cell supplied by Messrs Arthur E Evans of London has proved satisfactory A copper wire is fitted on the surface of the rear groove in suitable position to make contact with the exposed strip of selenium which lies near the edges of the front surface of the cell The wire is connected to an ordinary electric pole screwed into the back of the block A lead from this front surface pole connects with the negative pole of the galvanometer A second pole carries a spring clip which holds the photoelectric cell in place and makes contact with its back surface The back surface pole is connected to the positive pole of the galvanometer

Light filters of glass have been used The Chance red (No 2) green (No 4), and blue green (No 5) glass filters have been found suitable for most purposes Both the sensitivity and accuracy of colour measurement are increased by the use of light filters As in visual photometry, the measurement of colour intensity by photoelectric means is best carried out in light restricted to parts of the spectrum whose light is maximally absorbed by the coloured solution under investigation This condition is approximated with the filters recommended

The galvanometer for use with this instrument should be of about 1000 ohms resistance and should have a maximum deflection corresponding to about 10 microamperes The pointer type and the reflector type have been found equally satisfactory A suitable reflector instrument was supplied by Messrs Gallenkamp of London, and a pointer instrument by Messrs Unicam of Cambridge A completely assembled instrument made by Messrs Gallenkamp was likewise satisfactory The most convenient galvanometer scale is a logarithmic one on which the zero point corresponds to maximum deflection The galvanometer reading on the logarithmic scale is then directly proportional to the light absorbed *



Photoelectric colorimeter
A, hole for test tube B, bolt C photoelectric cell D, light filter E, head lamp F, switch G, galvanometer

A set of coloured solutions containing varying amounts of the same pigment will give readings which are directly proportional to the concentration

OPERATION OF THE INSTRUMENT

The galvanometer is levelled, the suspension is released and the " spot " or pointer adjusted to the ∞ mark at the left of logarithmic scale (0 on the linear scale) by turning the suspension knob The light is now switched on The bolt is turned up or down to regulate the amount of light reaching the photoelectric cell until the needle is at 0 It should remain at this point and will do so after the first few minutes if the electric supply is taken from a properly charged accumulator

A set of test-tubes are selected which will fit the hole snugly but easily They should all be of similar glass and free from obvious streaks and scratches A test-tube is half filled with water, wiped with a towel to remove any stains and placed in the hole The bolt is turned until the needle is at 0 A scratch is made on the side of the test-tube opposite a mark on the block to indicate that the tube should always be used in that position If on turning the tube in the hole more than a scarcely perceptible movement of the needle takes place the tube should be discarded since it contains flaws in the glass which are interfering with the passage of light The other tubes are tested similarly and a mark made on each to indicate in which position it should be inserted to ensure equal light transmission These tubes may now be used interchangeably The reactions leading to the production of the coloured solutions may be carried out in them so that no transference of the solution is necessary when it is read in the colorimeter A good quality of fairly thin-walled test-tubes should be used † The most convenient size is ⅝ × 5 in It will be found useful to mark them with a file to indicate volumes of 5 c cm, 10 c cm and 15 c cm

---

* The logarithmic scale used is in fact that of the extinction 'E' If the full deflection of the galvanometer is divided into a linear scale of 100 equal parts, on which 0 corresponds to darkness and 100 to the point of full scale deflection with 100% of incident light then any readings less than 100 will correspond to percentages of light transmission which are less than 100% of the incident light They can be thought of as different degrees of extinction of the incident light The extinction E or optical density is defined as the logarithm of the ratio of incident to transmitted light—i e E = log 100/% transmitted light If two solutions of different optical density are interposed in the light path then their extinctions E will be in the same relation one to the other as their concentrations of pigment—i e $E_1/E = C_1/C$ This simple photometric expression of Beer s law defines the condition to be aimed at with a photoelectric colorimeter To simplify the reading of E, and hence to simplify the calculation the logarithmic scale is used on the galvanometer It is arrived at in the following way If for instance a coloured solution transmits only 50% of the incident light—i e gives a reading of 50 on the linear scale—then its extinction E = log 100 50 = 0 301 The point opposite 50 on the linear scale is marked 0 301 on the logarithmic scale Similarly 100 on the linear scale is 0 on the logarithmic 10 on the linear is 1 (log 100/10 = 1) on the logarithmic and so on For convenience the values of E which comprise the logarithmic scale are multiplied by 100, and are plotted as whole numbers The extinction E of a coloured solution is spoken of as the extinction coefficient ' when it is determined at or reduced to a solution depth of unity—i e 1 cm

The appropriate light filter for a coloured solution is next tested for This will usually be the filter which gives the highest reading—i e, absorbs most light—and which gives most nearly a direct proportionality in reading with different concentrations of pigment Generally speaking its colour will be "complementary" to that of the solution—for a blue or green solution a red filter, for a yellow solution a blue filter, and for a red solution a green filter The selection of the filter is made as follows

With the filter and test tube of water in place, the galvanometer needle is adjusted to 0 by turning the bolt The test-tube of water is removed and another containing the colour standard is inserted The galvanometer needle is allowed to come to rest and the reading is recorded On replacing the tube of water the needle should return to 0 If it fails to do so, the light is again adjusted by turning the bolt and the reading for the standard is again taken This operation is now repeated with a second standard of double the strength of the first The reading of the second standard should be twice that of the first If this condition is not fulfilled, another light filter is tried If the proportionality is approximated but not reached, the fault probably lies in the presence of a "blank" colour—i e, a colour arising from the reagents which have been used to produce the colour by reaction with the standard substance A "blank" consisting of the reagents and water, with no added standard, is prepared and substituted for the water in the 0 adjustment Proportionality should now be obtainable with the appropriate filter

APPLICATION OF METHODS OF BLOOD ANALYSIS TO THE PHOTOELECTRIC COLORIMETER

Method	Changes if any	Light filter
Urea	Use a "blank"—i e, 7 c cm water and 1 c cm Nessler s for 0 adjustment	Chance blue green
Non protein nitrogen	,,	,,
Uric acid	Dilute coloured solutions (standards and tests) to 5 c cm	Chance red
Inorganic phosphate*	—	,,
Cholesterol	—	,,
Glucose	Dilute to 10 c cm	,,
Sulphanilamide	—	Chance green
Plasma proteins	(See urea)	Chance blue green
Bilirubin*	—	Chance green
Phosphatase	Dilute to 10 c cm	Chance red
Sodium	Dilute 1 in 10 with dilute acetic acid	Chance blue green
Potassium	—	Chance red
Hæmoglobin—		
(acid hæmatin)	—	Chance blue green
(alkaline hæmatin)	—	Chance green
(carboxylhæmoglobin)	—	,,

* An adaptor, to accommodate smaller bore tubes in the test tubes hole of the colorimeter, is useful in determinations where only a small volume of coloured solution is available

Use with standards—The use of a natural standard—that is, a solution containing a known amount of the substance under investigation—is almost universal in colorimetric practice with Duboscq type instruments The preparation of a standard each time a determination is made has another use besides furnishing a basis for colorimetric comparison—it is the easiest way of testing if anything has gone amiss in the analytical procedure For this reason the use of standard solutions should be continued with the photoelectric colorimeter When the present direct reading type, with a logarithmic scale, is used the calculation is simply that of direct proportionality—

Reading of test/Reading of standard × concentration of standard = concentration of test

The factor Reading of test/Reading of standard is reversed from that used with the Duboscq instrument, since the proportionality is here a direct, whereas with the Duboscq it is an inverse proportionality

The micromethods of analysis for blood which have been described by King and others (1937, 1942) have been readily adjusted for use with the photoelectric instrument Very few changes have been necessary they are given in the table, together with the light filter recommended for each method As in visual colorimeters the reading of the standard which is nearest the test should be used in the calculation

Use without standards—A coloured solution of given density will always absorb the same proportion of incident light, provided the light is invariably of the same intensity and wave-length With any given coloured solution and the proper light filter, therefore, the same difference in galvanometer deflection between water and coloured solution should be obtained This is the case for any one instrument, different instruments may differ sufficiently in details of construction to give slightly different deflections with the same solution By calibrating an instrument against a series of standards a factor may be derived or a graph constructed for the calculation of the concentrations of subsequent test solutions of unknown strength But it must be recognised that the accuracy obtained in this way may not be as great as that which will result from the simultaneous comparison of a standard with the test solution The reagents used in any analytical procedure may vary slightly from day to day—e g, by deterioration—and as a consequence the colour produced on one occasion may not be absolutely identical with that produced on another Moreover the selenium cell may suffer small alterations in its sensitivity and as a consequence the deflection resulting from any given incident light may vary slightly However, the accuracy obtainable may be sufficient for many routine examinations If it is desired to use the colorimeter in this way, a separate set of standard graphs or factors should be established for each instrument

REFERENCES

Evelyn, K A (1936) *J biol Chem* 115, 63
Hilger Ltd (1936) *J sci Instrum* 13, 268
Summerson, W H (1939) *J biol Chem* 130, 149
King E J, Haslewood, G A D and Delory, G E (1937) *Lancet*, i 886
— — — and Beall, D (1942) *Ibid* i, 207

ROSS INSTITUTE IN INDIA

THE second report * of the India Branch of the Ross Institute, which covers the year ended July 31, 1941 illustrates the words of the Royal Commission on Labour in India "The close relationship between agriculture and public health is obvious and the two react upon each other to a remarkable degree" Dr G C Ramsay, who has been principal of the branch since its formation eleven years ago, had previous experience of public health conditions in India extending over twenty eight years During that period the improvements effected make it difficult for newcomers to realise what India was like before When Ramsay went to India it was common for a tea plantation with a population of 1200 to have 200–300 sick attending hospital during the fever season, now the daily average might be a tenth or less Epidemics of cholera were not infrequent and the lowering of the vital reserve by malaria was responsible for the high incidence of anæmia, pneumonia and tuberculosis Though the chief public-health measure has been the eradication and control of malaria, attention has been directed to general sanitation, better water-supplies, disposal of night soil, maternal and child welfare

The anti-malaria measures which have brought about this remarkable change are cheap and simple Chief of these are the shading of streams, drains and swamps with shade vegetation, or the flushing of streams and river by cheap sluicing methods which, when properly installed, completely eliminate all mosquito breeding in water channels The incorporation of sluice-gates with syphon systems has proved a definite advance, these gates can be opened periodically to flush out silt which is liable to accumulate behind the dams To produce the right ee of shade lantana (*L aculeata*), basak (*Adhatoda ica*) and duranta (*D plumieri*) have been found most table in northern tea districts of India, mugwort *temisia vulgaris*) for tea, coffee, cardamom and rubber ates in the south The test of efficiency is the absence grass and weeds beneath the shade Where these eap horticultural measures (of which pictures are given) nnot be applied, other measures such as site selection, -drainage, stone packing, herbage packing, vertical ainage, seepage burial, application of larvicides or destruction of adult insects by house-spraying are employed The importance of diet deficiencies has been appreciated by medical officers and estate managers with the sult that wherever possible labourers are allotted land r cultivation of rice, maize, vegetables and fruits On any plantations the managers arrange demonstrations Soya bean cultivation Improved breeding has raised e standard of milk-supplies The success of these rious measures has been so evident that industries roughout India are subscribing to the institute The port contains summaries of the work carried out in any districts with statistical material including spleen dices, blood examinations and mosquito dissections hich deserves close study

---

† For more accurate work the very thin walled and uniform test-tubes of the type used in the Lovibond comparator are useful

* From the office of the Committee of Control, Royal Exchange, Calcutta

MEDICINE AND THE LAW

Attendance on a Fellow Practitioner

By an ancient and honourable tradition members of e medical profession renounce or reduce their fees for ttending a fellow member Dog, in the crude vernacular biology, does not eat dog If the legal implications gratuitous treatment are vague, disputes are rare ast month the Court of Session had occasion, in Bruce Clark, to expound the Scottish law in this matter consultant physician in Edinburgh had attended the te Dr A W G Clark and claimed 200 guineas as the alance of an account for professional services rendered etween January, 1938, and the patient's death in eptember, 1940 No account had been sent to Dr Clark uring his life-time The pursuer (as the plaintiff is tyled in Scotland) stated that he had attended the atient on ordinary professional terms, but had originally odified his charges considerably because the patient as a medical man though apparently not a practising ne, Dr Clark at various times made payments mounting to £61, handing him in an envelope some mall sum which he always referred to as a mark of ppreciation, Dr Clark said "the real settlement ould come later"

Dr Clark's executor pleaded in defence the "usual octor's custom" of gratuitous treatment It was, he aid, the general practice of the medical profession in Scotland that professional attendance and services were given free as between members of the profession He conceded, however, that death-bed attendance was in a special category and might properly be deemed a service rendered outside the scope of an implied agreement to serve gratuitously Doubtless the court had, in Scotland as in England, to presume that, in the medical profession as in any other, the rendering of services sets up an implied contract that the recipient will pay for them Was there a professional custom which excluded this presumption as between fellow members of the medical profession? If the law is invited to take notice of a custom, the custom must be definite and uniform The judges cannot automatically accept the general practice as a valid legal custom if, when treating a fellow practitioner, one doctor refuses to charge a fee, another charges half his ordinary rate of fees, while a third charges a merely nominal fee Lord Robertson, who tried the case in the Court of Session, held that the evidence failed to establish any professional custom or practice so uniform and general as to justify the implying of an agreement that the pursuer's services were to be given free On the other hand he thought that the ancient practice of medical men generally, and their current practice when attending a fellow practitioner, were material as showing that an agreement for gratuitous attendance might be inferred from facts and circumstances ("including silences") which, if the patient were not a medical man, would be inadequate to support any such inference Applying this construction, Lord Robertson decided that, throughout the period covered by the payments totalling £61, the services were rendered under an agreement to be implied from the facts and circumstances as excluding any legal obligation to make subsequent payment For the death-bed attendance he awarded 30 guineas

To sum up, then, the Scottish courts will not assume that one medical man treats another gratuitously, but they will be ready to infer, from the facts and circumstances of a particular case, that the parties intended the treatment to be gratuitous Whether an English court would make any distinction between death-bed attendance and other medical services seems, in the absence of authority, to be uncertain

PALESTINE

ENGLISH AND JEWISH DOCTORS MEET

Last year, in November, a British hospital ship cast anchor in a Palestinian port, and the commander asked the Jewish Medical Association to lecture to his personnel on aspects of medicine which they were likely to encounter in the country The lectures were duly given and a warm relationship sprang up between the association and the ship's medical staff Reciprocal lectures were delivered and a group of Jewish physicians visited and inspected the modern equipment of the ship

PHOTOSENSITISING EFFECTS OF EMOTIONAL STRESS

In the journal *Harefuah*, Dr Berlin reports the appearance of four common dermatoses—dysidrosis, erythema multiforme, purpura, and lichen planus—in connexion with emotional stress due to air-raids The changes were confined to the uncovered parts of the skin, and it was suggested that psychogenic factors were responsible for this photosensitising effect

WAR INJURIES

Professor Fruchaud, chief surgeon to the Free French Army in Syria, recently lectured to the Jewish University at Jerusalem on war injuries He advised extensive excision of the wound edges to prevent infection The lecture was attended by doctors of all nationalities now living in Jerusalem

A NEW AIR-RAID SHELTER

A shelter for the personnel and patients of Hadassah, the University Hospital, has just been completed, it consists of a tunnel, running between the hospital and the nurses' home, and is 80 metres long, by 2 5 m wide and 2 2 m high There are six emergency exits in addition to the two main entrances The shelter will accommodate 500 people and has electric light and equipment for performing emergency operations, it can be closed against gas-attacks At present it is certainly the safest and most useful shelter in Palestine

JERUSALEM HEALTH CENTRE

The work of the Strauss Health Centre during the past year was reported in the *Hadassah Bulletin* for October, 1941 At the clinic for backward children 291 patients were treated, 93 had educational difficulties, 23 showed problems in social behaviour There was an increase in the numbers attending for nervousness since last year no doubt owing to war conditions Lectures on child management have been held for mothers, and have been well attended, the average audience numbering about 50 Consultations have been held on difficulties in married life, but attendances have been fewer owing to the blackout A special department deals with speech disturbances, as in previous years the male patients outnumber the females in this department by four to one (36 9)

EXPERIMENTS IN SOCIAL MEDICINE

Social work at the Tel-Aviv municipal hospital has been begun in various ways For example, children are looked after whose parents, injured in air-raids, are being treated in the hospital A common kitchen for diabetics has been established, this was a much-needed measure since supplies of insulin have become extremely difficult to obtain, and many diabetics who could not afford it suffered in health The kitchen at least provides them with a suitable diet

A JEWISH BENEVOLENT FUND

The Kupat Cholim Jewish sick fund is the largest in Palestine, 184,000—more than a third of the whole

Jewish population—are members The report for the year 1939–40 shows that infectious diseases (other than malaria and parotitis) have increased Scarlet fever, for example, rose from 8 per 1000 in 1939 to 18 per 1000 in 1940, whooping-cough from 1 4 per 1000 to 11 Nearly all Jewish confinements have taken place in hospital, births have risen from 37 98 per 1000 in 1939 to 38 72 per 1000 in 1940, but the general death-rate has also risen owing to war conditions

DEATH OF A NOTED GYNÆCOLOGIST

Professor Schoenholz, who was for many years chief surgeon to the gynæcological department at Cologne University, died some weeks ago at the age of 48 He emigrated several years ago from Germany to Palestine where his knowledge and operative skill soon created a wide demand for his services His published work is well known to gynæcologists

In England Now

A Running Commentary by Peripatetic Correspondents

HAS the *Lancet* an Icelandic correspondent? If so I wish you would give me an introduction to him, for the armour of Icelandic society takes some penetrating Reykjavik is a fair-sized rambling town on a couple of small hills, with a small harbour and much shipping, with many big American cars but no gas-lamps, dogs, horses, trees or birds (not a sparrow!), with very few cats, but lots of plants, mostly flowering cacti, on the window-sills inside the poorly ventilated centrally heated rooms The children are beautiful, and the girls remain so, but the boys lose their rather effeminate good looks as they grow up The girls are very stylishly dressed I rarely see an unhappy or unhealthy face among the children, and hardly ever hear one cry—probably because they are allowed to run about and amuse themselves indefinitely and are not kept tied to apron-strings They get plenty of dairy produce if few vegetables, but nowadays the lack of greenery is made up by a free issue of ascorbic-acid tablets There seems to be a fair amount of tuberculosis among the adults, and I have spotted a few cases (too many) of old rickets, one or two of old poliomyelitis, and a perfect specimen of mongolism, aged about 40

* * *

The policeman, bare-headed, came out of the farmhouse to meet me and led me a field away to a group of outhouses, where two tranquil cows, some self-centred fowls and a pail half full of eggs made the foreground He lifted the latch of a byre and we looked down on the hay and a dead, hatted farmer, like a snake a deep purple constriction ran round his neck, and all but his hands and legs were stiff From a beam up above hung a frayed rope and propped up against a wall was a ladder "He must have brought that in special—it doesn't belong here She found him when she was getting the eggs" He had not been ill, he had not complained of anything, he had appeared perfectly normal in every way, they could think of nothing that could have worried him except possibly a few ploughing orders, he had no undue financial troubles His poor old wife told me of his customary cup of tea after dinner, then he had gone out Her pathetic refrain was, "Oh, I wish he hadn't done that" Everyone here knew him as a steady hard-working reserved man I felt the horror of one of Hardy's rural tragedies, which seem so exceptional and unlikely in print but are found in the chronicles of every village Going home I chewed the subject, trying to brush aside a contaminating feeling of guilt What could have made this fairly prosperous man of 65 with a happy family take his life? First, there must have been some emotional atrophy—no man could plunge his family into tragedy with his full affections I think in the senile recession love does go out before fear Then the only way in which he was exceptional was his taciturnity, even at home I suppose if one did have a genetic defect for word-forming, one's fears would grow by being unverbalised, undefined, uncompared with other people's At any rate, he'd seen something so horrible that he'd turned to grasp death as a friend Thank God for words—I shall never grouse at a grousing farmer again

I must have green fingers Twice in ten days have I attended the birth of twins This morning's effort took place in an ancient farmhouse Its heavy oak door, studded with great nails, is usually sported but it swung open easily and I went in through the cobbled entrance hall and vast flagged kitchen up the stairs to the patient's room The view from this window is unbelievably like a stage backcloth Running from right to centre is a low stone wall, back centre is a duck-pond with real ducks, and in the left foreground there is a cowshed with a thatched roof and four byres each surmounted by the name of its occupant done in white paint a long time ago, thus MYSTRY, MIRTLE, CANDY, CURLEY "Almost singing themselves they run," I quoted to myself, "let's see what we can do" The first couplet came to me as I was unpacking the midder bag

Mystery, Myrtle, Candy and Curly,
You and I have to get up too early

Not bad for a start Now what do we want? Chloroform? M'yes Perineal needle and sutures? I hope not Forceps? I doubt it, but you never know

Mystery, Myrtle, Curly and Candy,
We'd better have the forceps boiled and handy

There followed an interval during which I received Henry, a vigorous seven-pounder, yelling and kicking lustily Waiting for Richard, who had elected to present by the breech, the divine afflatus came upon me once more

Candy, Curly, Mystery, Myrtle,
Henry was a vertex but Dick's turned turtle

Blushing modestly, I ruptured Richard's membranes for him and he made a precipitate entrance into the world, his opinion of which he rightly expressed in no uncertain fashion I tied his cord, the tea was brought in, and, raising my cup, I composed and sang the following beautiful quatrain

Curly, Candy, Myrtle and Mystery,
You and I are living through too-much history
Let's hope that the twins will enjoy a calm
And prosperous partnership on this farm

Exhausted, but with a pleasant sense of satisfaction at having helped two young blades to grow where none grew before, I picked up my bag and went home to breakfast

* * *

Biologists and surgeons meet on common ground in knowing very little about burns The surgeon has his problem in the bag in all senses except the right one, but the biologist has a cast-iron excuse for his ignorance, for getting burnt is a complete biological novelty Animals simply don't get burnt—there isn't any fire or hot water to burn them with But while parasitic affections have a history dating from the beginning of biological time (say 2,000,000,000 years), getting burnt as a significant phenomenon dates from the Industrial Revolution I'm not suggesting that the Great Fire of London was merely a flash in the pan, and one of my colleagues points out that 15th century cannons undoubtedly caused severe burns in those who had the temerity to discharge them But that's not the point Evolution just isn't fast enough to build up a specific mechanism of defence on the experience of a few hundred years' occasional exposure to undue warmth The reflex to avoid burns is not specific, unlike the blink-reflex and the loud noise reflex it has to be *learnt*, and it's not *in any way* different from the reflex by which we protect ourselves from any bad thing—e g, a circular saw The flooding of tissues with serum after a burn is not comparable to a delicate specific mechanism of defence like antibody formation or the osteoblast reaction that follows a fracture

* * *

The effect of prolonged and intense cold on a fat middle-aged body is more distressing than is commonly imagined To stand for hours on the deck of a small vessel in an east wind requires fortitude—if not courage—for the process of inevitable, gradual, painful numbing leaves the mind, like that of Dr Johnson's condemned criminal, vastly clear Any amount of protective clothing—sea boots, sea-boot stockings, scarves, duffle coat and balaclava helmets—offers as little resistance as a snowflake to fire At first the pain in the feet is a drawn-out agony, then the [illegible] and the front of the thighs In my experience the last and curiously painful portions of the body to suffer are the nipples, and the external genitals The two supposedly exogenous zones behave differently. The nipples become erect but the testicles seem anxious to escape into the warmth of the inguinal canals and the penis assumes clitoridean proportions On our ships there were no chart-rooms, no hot coffee and no Nelson's Blood

* * *

No matter how much else I may have to omit in a paper, I always read the obituaries, whether it be the *Lancet* or the *Times* Pace the psychologists, there is no morbid or sadistic reason for this habit, nor is it even a manifestation of an inferiority complex If I were pushed for an explanation I should probably say that, for a busy man, it is one of the simplest ways of learning the history of the previous few decades The reference in the obituary of Graham Steell to his aphorisms and the examples therein quoted found me in a reminiscent mood The reference to the assessment of the correct length of the stethoscope in terms of the jumping distance of the flea pleased me, for though I never met Graham Steell this is a piece of advice which I always hand on to my students when they enter on their clinical period But the age of aphorisms seems to have passed I periodically study the various hospital journals for examples of "sayings of the great" These are varied enough but most lack the pith, the originality and the felicity of phrasing of the sayings of the great clinicians of former generations To take syphilis, for example, how could the ætiology be more neatly summarised than "Bacchus, Venus and Mars," or how could the whole gamut of this disease be better put than "a night with Venus and a lifetime with Mercury"? What modern obstetrician has improved on "sow the wind and reap the whirlwind"? That worthy north-country surgeon, Rutherford Morison, pilloried the tendency of medical students to be always on the lookout for rare diseases in the following words (his distinguished pupil now at Hammersmith will correct me if I am wrong) "In this country if you see a bird on the housetop it *may* be a canary but it is much more likely to be a sparrow" Few dressers who passed through his hands ever forgot this simple truth so pithily expressed The causes of the decline in the quantity and quality of aphorisms are complex, but two predominate (1) this "scientific" age is suspicious of any statement unless it is amplified by pages of technical jargon and "proof", (2) (whisper this not in Gath) the intellectual background of our teachers is rapidly declining, certainly so far as knowledge of the humanities is concerned A few are still able to illustrate their lectures by appropriate quotations from the Bible Shakespeare or Voltaire, but this attribute is so rare these days that the solitary member of the hospital staff who is able to practise it is looked on by his students as rather an oddity Other days, other customs, but many customs are discarded not because they are bad or have been improved on but simply because they are the customs of other days Our pathologist and I decided the other day that we were the last of the Puritans Certainly I am old-fashioned enough to believe that, while it may not be impossible, it is certainly extremely difficult to be a good doctor without the ability to express oneself in the King's English

* * *

All this talk about sex instruction to children seems silly to one who was brought up in a family where, for instance, the new curate was asked if he agreed with Gilbert White that larks copulate on the wing; where at nursery tea a younger brother was jeered at when he said he'd seen a thrush mating with a blackbird, because he had obviously mistaken the spotted breast of a hen blackbird for a thrush; where one of the family jokes was that the stud fees of a buck rabbit that belonged to the washerwoman were recorded in the laundry book, sandwiched between "Hd'ks, 24, 2*s*" and "Shirts, 7, 2*s* 4*d*," as "Rabbit, 3 vis, 1*s* 6*d*", where cross-pollination, and the breeding of hawk-moths, mice and the like were regarded as the most interesting things in the world, as indeed they are If there is a mystery about the macroscopic acts that lead to fecundation it is the purposeful creation of the adult who seeks to protect his pleasures and his germ-plasm, the bribe and the reality, from the surging host of adolescents Hence the sexual taboos and codes Microscopically I suppose it is true that the strange primordial ceremony of initiation but feebly glimpsed by human eye, where priestly protoplasm genes and thurifers, genules and acolytes, move in solemn order before the high altar, is in fact, save for the source of life itself, the supreme mystery

* * *

The other day my eye caught the following announcement in the "Births" column of our local paper, the *Erewhon Gazette and District Advertiser*

At X Nursing Home, Erewhon, to the wife of ——, a beautiful son, thanks to doctor, nurse and Muriel (No visitors)

It sounds rather like infamous conduct in a professional respect, but what was Muriel doing in that galère?

Public Health

Intestinal Infections in War-time

In 1929 there were 112 deaths from the enterics in England and Wales, exactly a tenth of the number in 1916, and by far the fewest in any year of our history In 1940 the number was 135, the second lowest, and though that for 1941 will not be quite so favourable it will be very low The notifications of the combined group of typhoid and paratyphoids in the three years 1938–40 were 1322, 1479 and 2833 In 1941, for the first time in England and Wales, typhoid was officially separated from the paratyphoids, so we shall be in a better position to follow the course of these diseases Typhoid is slowly becoming extinct in Britain and the war has not interfered with its downward course It was feared that it might do so because of the damage to waterworks and pipings from air-raids, for typhoid on a big scale is always connected with polluted water, but though the damage to the supply system in 1940 and 1941 was at least as serious as we expected, in no place did it give rise to any outbreak of typhoid On the other hand, outbreaks of paratyphoid B have been unusually numerous and extensive since the war started, though fortunately of trivial fatality Most of the outbreaks have been spread by artificial cream Food-poisoning outbreaks have not been over frequent and most of them have been small with little or no fatality Several of the outbreaks have been due to *Staphylococcus aureus*, others to various organisms not formerly suspected of causing poisoning and fewer than usual to the various salmonellas In Liverpool in 1940 there were 40 notifications of paratyphoid and 7 of typhoid with no fatality, in Carlisle, 15 paratyphoids and no typhoid, also without fatality, in Edmonton 26 notifications, not differentiated, with no fatality, in East Ham 7 paratyphoids with no fatality; in Ilford 28 notifications, not differentiated, with one death These are samples taken at random In 1941 there were extensive epidemics of paratyphoid in Bristol and Liverpool areas, both spread by artificial cream and both with fatalities below 1% of recognised cases

On the unfavourable side is an increasing prevalence of bacillary dysenteries and a brisk rise in infantile diarrhœa The dysenteries which have furnished positive bacteriological findings have been mainly of the Flexner and Sonne type, but among some prisoners of war cases of the much more formidable Shiga type have been detected Infantile diarrhœa is gauged by the returns of deaths from "infective enteritis or diarrhœa under two years of age" Many of these infant deaths are not due to infective enteritis In past years, when nearly 10% of all infants born died from diarrhœa, infective enteritis swamped deaths from other digestive disturbances, but in years and places where few infants die of diarrhœa the causes of the fatalities are various The rise in diarrhœa seen in 1940 and 1941 has slackened this year

Since the outbreak of war there has been an increase of about 25% in fatal peptic ulcer but a fall of about 20% in fatal appendicitis Several outbreaks of trichiniasis, some extensive but without fatality, were reported in 1940 and 1941, due to eating uncooked or partially cooked sausage meat This disease was probably commoner in the past than the records show, for minor outbreaks are easily missed, an outbreak of some importance occurred in Wilts about five years ago Slight infestations of swine with trichinella are not easy to detect by inspection, but since the worm is destroyed by thorough cooking the disease in man can be controlled

From the Annual Reports

In his 1940 report for Hornsey, Dr R -P Garrow says that the intense cold of the winter quarter, causing a high mortality among the very old and the very young, together with deaths caused by enemy action, account for the sharp rise in the general death-rate from 11 56 in 1939 to 15 16 in 1940, and, inferentially, the rise in infantile mortality from 27 to 45 Otherwise the year's health record was very favourable Direct enemy action caused many deaths in 1940 very unevenly distributed, and this is one reason why the death-rates of that year show such great local variation The severe winter was common to the whole country, but its influence on the death-rate varied according to the composition of the population Unlike that from enemy action, the mortality due to the weather would level out on standardisation Accepting that man is mortal and that his vitality declines as he grows older, we must accept also that the sudden termination of his life from the vagaries of Nature which we cannot control is a natural phenomenon, even if we attribute the end to such pathological conditions as bronchitis or heart disease We are not, however, prepared to accept cold as a natural cause of death in the young, for this can be avoided So though we accept the fact that juvenile mortality does rise in cold winters, we are dissatisfied with the explanation

Except for the rises in tuberculosis and of infantile mortality, 1940 was a favourable year for health, unmarked by any high prevalence of serious disease Since tuberculosis and infantile mortalities are the two most sensitive indices of the nutrition of the people they call for special attention If, in fact, we are being fed below par we should not obtain any tangible evidence of it in the general population for years to come, but infants and the tuberculous react immediately On the other hand, we must take account of other factors which might act adversely on these two sections of the population and not assume that the rises in tuberculous and infantile mortalities are necessarily caused by malnutrition Rationing has caused a more even distribution of food than this country has ever experienced, so even if the amount available per head were less than necessary for perfect health, the bulk results would show a diminution of ill health attributed to ill nourishment But the distribution of food is not quite even, for sometimes the very poor cannot afford their allotted rations and the wealthy can obtain an unfair share of unrationed goods If therefore the enhanced tuberculosis and infantile mortalities were due to ill feeding consequent on food shortage they should be distributed according to the wealth or otherwise of the various population units Let us take a batch of annual reports at random and see what they will tell us

Hornsey rise in infantile mortality from 27 25 to 49 3, lowest number of deaths from tuberculosis on record

East Ham infantile mortality level at 41, tuberculosis deaths rose from 31 to 69, tuberculosis mortality rose from 1 1 to 1 5

Hammersmith infantile mortality rose from 43 to 51, tuberculosis mortality rose from 0 8 to 1 1

St Marylebone infantile mortality rose from 60 6 to 67 1, "no evidence of excessive mortality from tuberculosis"

East Suffolk infantile mortality 44 3 against quinquennial average of 43 4, tuberculosis mortality rose from 0 45 to 0 48

Shrewsbury infantile mortality fell from 0 42 to 0 31

Leamington infantile mortality rose from 50 to 55, tuberculosis mortality fell from 0 54 to 0 42

Newport infantile mortality rose from 53 6 to 79 7, tuberculosis mortality rose from 0 73 to 0 98

Salford infantile mortality rose from 69 to 76, tuberculosis mortality (pulmonary only) rose from 0 9 to 1 1

Tunbridge Wells Tuberculosis mortality fell from 0 38 to 0 37, the lowest rate recorded

These excerpts suggest that rationing has had nothing to do with the rise in infantile mortality, but may have had a slight adverse effect on tuberculosis

Several medical officers express disappointment at the continued high prevalence of diphtheria in spite of the immunisation campaign, and more are surprised that evacuation did not lead to extensive epidemics in reception areas, but immunisation is still too limited and in general of too short duration to affect the general situation, whereas in many reception areas the work done in years past might have been sufficient to prevent outbreaks of diphtheria from assuming serious proportions Some reduction of the fatality of the disease has occurred in the past few years

From the school reports the matters of chief interest are increase in the numbers of children suffering from pulmonary tuberculosis, reduction in numbers with organic heart disease, and considerable reduction in the numbers submitted to operation for tonsils and adenoids The first is probably due mainly, if not exclusively, to better detection, the last to disorganisation of school work and the break-up of families, but the reduction in heart disease seems to be real

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS, M P

THE house reassembled after the Easter recess to face the largest Budget ever presented in this country This budget directs colossal sums to the war effort and limits more and more personal expenditure on everything but strict necessities Beer, wines and spirits, tobacco and entertainments, lipstick and hairdressing are to be more expensive, indeed practically everything except food and utility clothing The Press have baptised it the Austerity budget, but it is doubtful whether even now it is as severe as the name suggests, it does indicate the direction of policy Emphasis on saving, restriction of minor luxuries, pressure for more production and longer hours of work, however willingly accepted—of the willingness there is no doubt—all throw greater strain on the individual We have less time to do things and more things to do We are, for example, a dirtier people than we were in 1939—the statistics of scabies and of pediculosis show this clearly How far is this related to the greater pressure on our lives? And how far is the increased incidence of tuberculosis due to the same cause?

When Mr Bevin announced in answer to a question that he was now able to revoke an order he made allowing men, women and young persons in the potteries to work longer hours than those permitted by the Factory Acts, Mr Graham White asked whether the views of the Industrial Health Research Board on the extension of hours in the pottery and textile trades had been sought before the order was framed The answer was no, but it is clearly a mistake not to use the advice of the board when framing orders They understand what strain the human organism can bear When Mr Bevin brushes aside medical advice, saying, "We do not rely too much on experts We have to apply some common sense," he gives himself, and the nation, an unnecessary handicap New weapons in war arise out of scientific work and so should new weapons of administration

It is hoped to have a debate on health questions at an early date—one on hospitals will have taken place by the time these notes are in print This health debate has been postponed several times already but it is hoped that no further postponement will take place Expert knowledge on health matters is urgently needed in our national affairs The Army, Navy and Air Force authorities lay stress on the application of scientific knowledge to the protection of health But in industry we are only half-heartedly using scientific knowledge Over-long hours and bad conditions have already been shown to be ineffective as stimulants to production To hope that common sense apart from expert knowledge can decide these matters in the future endangers our productive effort

FROM THE PRESS GALLERY

Priority Milk

In the House of Lords on April 15 Lord ARNOLD called attention to the cumbersome procedure which invalids have to follow to obtain their supply of priority milk The doctor, the patient, the food office, and the dairyman all had to exchange forms and when a priority certificate was issued it lasted only for one month, then the whole process had to be gone through afresh Most of the patients eligible for extra milk needed it for longer than one month, and he suggested that doctors should have power to give a certificate for six months

Lord Woolton said that because the supply of milk varied with the season, but the demand did not, the Food Ministry had found it necessary to institute priorities so that each person could get the milk he needed The determination of these needs was not a matter for amateurs, the Medical Research Council had appointed a special committee to advise him how to allocate our supplies He had given priority claims to children, nursing mothers and invalids, and for all those classes he had prescribed the exact quantities that his medical advisers considered necessary Even in times of the greatest stringency the invalids had been able to get their milk The machinery for granting priorities was devised in consultation between the Medical Research Council, the British Medical Association and the Food Ministry officials He believed that it was a machinery that safeguarded the health of the patient, and safeguarded the doctor from the pressure which might be brought to bear upon him by people who felt that they would be better if they had a greater share of this food He was indebted to the medical profession for the care with which granted they had these certificates In the opinion of the medical profession it was unnecessary to give a certificate in the first instance for longer than one month, but there were diseases where milk had to be given continuously, and for these the certificate was given for a longer period

Family Allowances

In the House of Commons on April 16, Sir Kingsley Wood, the Chancellor of the Exchequer, winding up the debate on the Budget resolutions, said that the investigation into family allowances which he had ordered was now nearing completion and he hoped to give the House shortly some information of figures as to the costs in a white paper

QUESTION TIME

Juvenile Hours of Work

Mr A Hollins asked the Minister of Labour whether he could now announce the decision about the continuance of his order of Dec 23, 1941, on working hours in the potteries —Mr E Bevin The order was made to enable men, women and young persons remaining in the industry to work longer hours than those normally permissible under the Factory Acts in order to maintain the necessary output with the reduced labour force, and as I naturally do not wish to authorise such relaxations of the ordinary law to a greater extent than necessary I have had the position under close review It now appears that the industry has been able to adjust itself to the new situation without a general resort to overtime, and in view of altered conditions in the industry itself I have come to the conclusion that a general order of that kind is no longer necessary or appropriate I am therefore revoking it as from May 3, but I should like to make it clear that some relaxations of the Factory Acts may still prove necessary in special cases in order to secure the output required

Mr K. Lindsay asked whether there was any chance of doing the same thing in the cotton industry —Mr Bevin Not until I have made the necessary adjustments

Mr Graham White asked if the views of the Industrial Health Research Board, on the extension of hours of employment of young persons, were ascertained before the orders dealing with hours in the pottery and textile trades were made —Mr Bevin said No, the function of the board is to advise upon or carry out suggested schemes of scientific research on the basis of actual conditions and of a kind which may be expected to occupy a long period of time In the cases referred to I had to decide quickly whether war requirements necessitated a temporary change of conditions In the cotton industry I am arranging for some inquiries in Lancashire, through the factory inspectors, as to whether any general signs of fatigue were manifesting themselves among the juveniles as a result of the longer hours in cotton spinning mills —Mr T E Harvey Will that inquiry include medical advice ?—Mr Bevin We do not rely too much on experts, we have to apply common sense (Laughter)

National Loaf

Sir Ernest Graham Little asked the parliamentary secretary to the Ministry of Food whether the stocks of white flour held at present by the Government were of 70% extraction or higher and were fortified with any additions, whether it was intended that the national wheatmeal loaf to be shortly exclusively supplied was to consist as to 25% of this lower extraction flour, whether he could give any approximate date when the loaf of 85% unmixed with white flour might be expected on sale, and whether it would be distinguishable from the composite loaf immediately provided —Major G Lloyd George replied Stocks of white flour consist in part of home milled flour of 75% extraction, and in part of imported flour of similar quality In both cases the flour is fortified with vitamin B_1 In arranging for the use of these white flour stocks the main consideration has been to avoid loss by deterioration Bakers have, therefore, been permitted to use up to 25% white flour with national wheatmeal in making the national loaf The date when the loaf will be made entirely from 85% wheatmeal will vary in different areas, depending on the quantity of white flour in those areas and the necessity for its early use It is not intended to instruct bakers to distinguish in any way the national loaf carrying the authorised admixture of white flour from that made entirely from 85% wheatmeal, but the latter will, of course, be slightly darker in colour

Addition of Calcium to Flour

Sir Ernest Graham-Little asked Major Lloyd George whether it was his intention to add calcium to the flour for national bread, and if so, from what date, what salt was to be used and in what quantity —Major Lloyd George replied Yes The decision was originally announced in July, 1940, but the supply position of such foods as milk and cheese has been better, and the national intake of calcium has accordingly been greater, than was then anticipated In view, however, of the changed outlook owing to the reduction of imports, the Minister of Food, after consultation with the Minister of Health, has decided to arrange for the addition of 7 oz. of calcium carbonate (creta preparata) to each 280 lb sack of flour This addition will proceed district by district throughout the country until all flour on sale will be so treated

Sir H. Morris Jones Is not this a fad on the part of a few scientific advisers, and is it not against the experience of most experienced general practitioners ? Why should every man, woman, and child have forced on them calcium which is likely to be injurious ?—Major Lloyd George That, of course, is a matter of opinion We are advised that it is essential to increase the intake of calcium, and it is not the advice of faddists but of eminent medical men The decision was made in consultation with the Minister of Health.

Wholemeal Bread

Sir Ernest Graham-Little asked Major Lloyd George whether it would be possible, and under what conditions, for persons who preferred to eat bread prepared from the whole grain, without any admixtures, to obtain such bread and whether vendors providing this bread would be penalised if they did not, at the same time, stock national bread.—Major Lloyd George replied There is no restriction on the manufacture of bread made from wholemeal for those persons who prefer it Where such bread is sold at prices not exceeding the maxima in the Bread (Control and Maximum Prices) Order, vendors are not required to stock national bread. If higher prices than 2*d* per lb or 2½*d* per 1 lb loaf are asked, the seller must have available national bread at the time of such sale

Medical Man Power

Sir Ernest Graham-Little asked the Minister of Health how many registered medical practitioners were at present working for the Emergency Medical Service and in first aid posts, how many of these were of military age and could be employed as medical officers to the armed services, and whether, as the estimate made at the outbreak of war of the probable requirements of the EMS had so far proved too large, a transfer of medical personnel would now be made from the EMS and first aid services to the armed services —Mr E Brown replied The number of doctors enrolled in the EMS on March 31, including those on a whole time or part-time salary but excluding those who attend on a sessional basis when required, was 1775, and the number of doctors in charge of first aid posts on Dec 31, 1941, was 2587 All those liable for military service come under review by the Central Medical War Committee and its local committees, and the decision whether a doctor is to be recruited depends on the needs of the hospital or other service in which he is engaged. A percentage reduction in whole time medical staffs of hospitals is being carried out on the recommendation of the Medical Personnel (Priority) Committee and the reduced establishments will be no more than are required to treat casualties from enemy action on the scale actually experienced and to provide for the various other types of patients now included in the Emergency Hospital Scheme The doctors in the first-aid services are almost invariably engaged also in general practice or other medical work and their availability for the Forces is judged on the needs of that other work rather than on their first-aid commitments

Admission to Nursing Register

Captain W F **Strickland** asked the Minister whether, in view of the urgent national need, he would introduce any necessary legislation, or take any other emergency measures, to enable retired fully trained nurses, not previously registered under the Nurses Registration Act, 1919, to become so registered after recommendation by the medical profession without the long delay and inconvenience of a period of fresh qualification —Mr **Brown** replied Legislation would be required for the purpose of varying the conditions on which nurses can be admitted to the register I do not think I should be justified in introducing such legislation

Population Estimates

Sir **Francis Fremantle** asked the Minister what were the crude birth and death-rates for England and Wales for 1941 —Mr **Brown** replied the crude live birth- and death rates in question are 14 2 and 12 9 per 1000 population respectively

Sir F **Fremantle** What will be the estimated population of England and Wales in 40 years' and in 100 years' time if birth- and death rates continue at present levels?—Mr **Brown** A memorandum has been prepared by the Registrar-General's department with respect to the estimation of the future population of this country In answer to further questions Mr **Brown** added that when the report was printed some time ago the memorandum was not printed with it He would consider the best way of making it generally available, as the subject was important

Rations in Enemy-occupied Countries

In answer to a question Mr D M **Foot**, parliamentary secretary to the Ministry for Economic Warfare, said that the weekly rations for a normal consumer in Belgium are, bread, 55 oz , meat, 8½ oz , fats, 3½ oz , potatoes, 123 oz , sugar, 8 oz In Greece the weekly bread ration is 37 oz There is no fixed ration for other foodstuffs, which are exceedingly scarce In Poland there is no uniform rationing scheme, since rations vary from place to place, and there is marked discrimination between Germans, Poles, and Jews But the latest figures available for Poles in Warsaw are, bread, 39 oz , meat, 1½ oz , fats, 1 oz , and for Poles in Cracow, bread, 52 oz , meat, 3½ oz , fats, 1 oz , sugar, 4½ oz , groats, 5½ oz In none of these three countries are the published rations always fully available

Food-supplies for Greece

Seven thousand tons of wheat, which had been made available by H M Government and paid for by the Greek Government reached Piraeus in the steamship *Radmanso* during the third week in March I have not yet received a report as to the distribution of this cargo among the Greek people (Mr **Foot** replying to Sir T **Moore**)

Cause and Prevention of Scabies

Mr C G **Ammon** asked the Minister of Health what was the cause of the increase of scabies among the civil population , and what steps were being taken as preventive —Mr **Brown** replied The causes of the increase in scabies are not fully understood Special war time conditions undoubtedly conduce to the spread of the disease but a steady increase in incidence was noted for some years before 1939 Research for which I arranged over a year ago is now being continued by the Medical Research Council and curative and preventive measures based on this research will, I hope, help to reduce the incidence Local authorities, under an order made in October last, received additional powers the object of which was to secure the early ascertainment and treatment of cases of scabies which would otherwise have gone undetected and would have acted as reservoirs for the parasite causing the disease

Scabies in the Army

Mr F J **Bellenger** asked the Under Secretary of State for War what arrangements existed, in view of the prevalence of scabies, to cleanse and sterilise blankets periodically throughout the service —Mr E D **Sandys** replied All army blankets are disinfected every six months and scabies is not confined to the Army The incidence has been increasing among the civilian population More frequent disinfection of blankets has been tried but it has not reduced the incidence of scabies I too am anxious to reduce the incidence of scabies, but I am satisfied that it is not caused by the state of the blankets I understand that it is usually spread through bodily contact and that infection from blankets only accounts for a very small proportion of cases

Distribution and Consumption of Wood Alcohol

Colonel **Arthur Evans** and Sir **Leonard Lyle** asked the Home Secretary what steps he was taking to deal with the growing danger to public health through the illicit distribution in labelled bottles carrying well-known trade names of wood alcohol, or similar spirit substitute —Mr H **Morrison** replied I have been in consultation with the Board of Customs and Excise and the Commissioner for Police, and I find that there has been one case in which a workman stole some wood alcohol and used it to strengthen home made wines which he produced on a small scale He was convicted and sent to prison There have been stories in the Pr suggesting the prevalence of such practices but there is no evidence so far forthcoming to support these allegation

Dispensers in the Forces

Mr **Bevin** informed Mr T Kennedy that only suitably qualified men were posted to the Forces by his department for service as dispensers, and the demands from the Services for such men had been substantially met He was informed that it was not the practice of the Services to employ unqualified men in the Service trade of dispenser

Sir **Irving Albery** Is the Minister aware that in the RAF women are being trained to fill these positions ?—Mr **Bevin** I assume that if they are trained and pass a certain standard, they become qualified

Rationing of Pharmaceutical Compounds

Mr W S **Liddall** asked the Minister of Supply whethe he was prepared to introduce a rationing scheme for the materials for pharmaceutical compounds, having regard to the shortage of certain of such materials for essential purposes, at a time when they were being used largely for the purpose of manufacturing pre-packed drugs which were sold in chain stores —Mr **Charles Peat** replied Control is already exercised over the distribution to manufacturers or wholesalers of some of the materials used in pharmaceutical compounds, and the Minister is considering, in consultation with the Minister of Health, whether control should be extended to certain other materials

Public Health Broadcasts

Mr H **Brooke** asked the Minister of Health whether, in view of the importance of maintaining high standards of national health in war time, he would ask the BBC to arrange more frequently for popular talks on health subjects —Mr **Brown** replied The BBC has arranged to broadcast a new series of weekly health talks every Monday evening beginning on April 13 This series will be in addition to the Health Magazine which is broadcast every Friday morning, and on which the BBC keeps in constant touch with my department

---

BP CHANGES TO SAVE ALCOHOL

In the fifth addendum to the BP, which will shortly be published, a number of modifications have been made to economise in alcohol The main one is the introduction of eleven concentrated tinctures Of these, the following ten are each four times the strength of the ordinary BP tincture (doses in parentheses) concentrated tincture of orange (min 8–15), capsicum (min 1–4), lemon (min 8–15), quassia (min 8–15) and tolu (min 8–15) , concentrated compound tincture of cardamom (min 8–15), cinchona (min 8–15) and gentian (min 8–15) , concentrated ethereal tincture of lobelia (min 1½–4) , and concentrated ammoniated tincture of valerian (min 8–15) On the other hand, the new concentrated camphorated tincture of opium (min 4–8) is roughly eight times the strength of the ordinary tinct opii camph , and min 8 of it contains about gr 1/30 of morphine In addition to these tinctures the addendum makes official the liquid extracts of quillaia (min 1½–3) and of squill (min 2–8) of the BPC, and emulsions of chloroform (min 5–30) and of peppermint (min 5–30) which are also to all intents the same as those of the BPC Ext scill liq is roughly ten times the strength of tinct scillæ There is a new concentrated solution of ethyl nitrite (min 2–8) which is about eight times the strength of spirit of nitrous ether, and a new aromatic solution of ammonia (min 15–60) which is nearly the same as that of the BPC and equivalent to sp ammon aromat, in content of ammonia and ammonium carbonate The monograph on menthol has been revised so as to include the synthetic product There is a useful cumulative index to the five addenda

Letters to the Editor

WHAT ARE THE FACTS?

SIR,—Some years ago a tuberculous patient consulted me on a family problem "Should I agree to my only child becoming a nurse? You know my history and the care we have always taken to build up the girl's health Is it all right, the hard work and all that?" As the girl was barely 18 I advised a year's delay and then, if the desire was maintained, careful choice of a training school Four years later came the final state examination and X went to it from a heavy night on duty She failed, and explained to her parents, she knew it must be so she "just couldn't think" She was greatly cast down by her failure and later the matron, concerned at her appearance, arranged to put forward her summer holiday She joined her mother at a railway terminus, had a violent hæmoptysis before reaching the train, and was dead within a month

I hoped this story was atypical but medical colleagues in sanatorium work did not agree One of them who receives the women patients of a large industrial area said, frankly "too many young nurses come here as patients, it's disquieting" Since then inquiries have been held as to employment incidence as regards tuberculosis but figures as to nursing are not forthcoming Why? Does the shortage of nurses prohibit the disclosure of facts? The toll of tuberculosis is highest and most persistent among young women at the age of probationer nurses Can employing bodies such as county councils give assurance to the medical profession and the public that there is *no* added risk in nursing as compared with other employments? Public money and effort are being expended to popularise nursing This would be more effectual if lurking apprehensions about the conditions awaiting recruits were first cleared away Should this not be possible, other questions arise What lessening of undue strain can be arranged? Perhaps the story with which this letter starts suggests one evil to be eliminated Serial X-ray examination of nurses should be compulsory and much fuller recognition is needed of the fact that study for examinations is incompatible with full-time arduous employment

Establishment of public confidence that nursing offers as reasonable terms of service as other reserved occupations would surely do more to help recruitment than anything else

Moor Park ESTHER CARLING

FRACTURE OF THE FEMORAL NECK

SIR,—From Mr Haydon-Baillie's letter of April 11 I conclude that he can have had little practical experience with the abduction treatment since he speaks of it as an "ambulatory device" In his opinion "the senile condition of most of the sufferers" would prevent its application, because of the tendency of this class of patients to "break up as the result of such an injury or being put to bed or both renders the patient unable to avail himself of the treatment" He implies therefore that the relief of discomfort "and the avoidance of the liability to fatal hypostatic pulmonary congestion and bedsores" rather than the treatment of the fracture should be the first consideration

Paradoxical as it may seem these are the very arguments that have been urged to support positive treatment The patient lies in an inclined plane and is turned to the ventral posture systematically It may be emphasised that the "Whitman plaster" is not a splint for the fracture but is a means of supporting the limb in the attitude that makes the anatomical splinting effective, thus in its application the first concern is the comfort of the patient In my experience this treatment, which relieves pain, permits changes of attitude and transportation to the open air, and which above all presents a prospect of recovery as contrasted with inevitable disability is the most conservative treatment, even of the aged In fact contrary to the prevailing opinion these patients are very amenable to "bed treatment," and their physical condition often improves during the period of enforced rest Of 441 cases of medial fracture treated by this method, reported by several observers, 126 were over 70 years of age, 57 over 80 and one successful case has been reported at 102 I conclude that the evidence at command justifies the statement, that the abduction method has made treatment in accord with surgical principles practicable and effective in the great majority of the cases

The Athenaeum ROYAL WHITMAN

ANOXÆMIA AS A TEST FOR CORONARY DISEASE

SIR,—To your short leader on coronary disease (March 28, p 388), dealing with anoxæmia as a diagnostic test, may I add a cautionary tale for anæsthetists, and an illustration of the danger of inducing anoxæmia as a test

I gave a nitrous-oxide and oxygen anæsthetic to a woman of 55 for the removal of two teeth Early induction was with 95% nitrous oxide and the rest of the anæsthesia, lasting about three minutes, was with 90% nitrous oxide and 10% oxygen, given with a McKesson apparatus The extraction was effected easily and gently, at no time was there cyanosis, jactitation, struggling or excitement Return to consciousness was moderately rapid but was accompanied by dyspnœa, mid-chest pain and pallor These symptoms persisted and three days later the diagnosis of coronary occlusion was confirmed by an electrocardiograph Recovery proceeded uneventfully

Upon inquiry it was learned that this patient had considerable hyperpiesia (BP 225/120, 230/140) and arteriosclerotic retinal vessels There was no previous history of anginal pain As her hæmoglobin content was normal, the absence of cyanosis is positive proof of the limited degree of anoxæmia Excluding accidental association, and factors such as excitement and shock for which there appeared to be little evidence, it seems evident that the sudden disaster was due to the anoxæmia of nitrous-oxide anæsthesia acting on an already sclerotic coronary vessel This case also illustrates the necessity for clinical interrogation and examination before anæsthesia, even for so-called minor anæsthetics

London, N W 8 S CHARLES LEWSEN

CASE HISTORY IN DIAGNOSIS

SIR,—I find it difficult to visualise the state of perfection insisted on by Dr Plesch in your issue of Nov 15, 1941 (p 623), for my many medical friends are but human And what exactly does he mean when he says "If we do not discuss his case with the patient we bring medicine to the level of veterinary medicine"? That one cannot converse with an animal is of course true but he goes on to point out the importance of "inspection" or in other words the faculty of observing closely and accurately This power of observation is of even greater importance to the veterinary clinician than to his opposite number in human medicine because he cannot get a case history direct from his patient and must therefore rely more on observation and deduction In the case of children I presume Dr Plesch in addition to "inspection" obtains his information from the parent or whoever is in charge, which is exactly what we endeavour to do in veterinary medicine, and I venture to think he would find getting at the truth by "clever" cross-examination (let alone psycho-analysis) of a British farmer about his stock not so easy At all events he could have made his points clear without disparaging veterinary medicine which is a branch of our mutual mother science

Veterinary Laboratory, Entebbe J CARMICHAEL.

RESUSCITATION IN SHOCK

SIR,—The recent correspondence on shock seems to show that a little interest is at last being taken in this important subject Dr Dunlop and Mr Paramore both criticise the modern tendency to indiscriminate blood-transfusion I absolutely agree with them In the *Lancet* of Jan 2, 1937 (p 6), I published some observations on blood changes after operations and came to certain conclusions, some of which I should like to quote. "The best method of fluid replacement if the oral route is contra-indicated is per rectum . Since pulmonary œdema may result from abnormally low percentage of protein in the plasma, and since intravenous fluids tend to lower this percentage, the level of the plasma protein should be ascertained before giving fluid intravenously. . . Owing to the danger from protein loss, emergency treatment of postoperative shock should preferably consist in intravenous infusion of plasma . . Blood-practice or other medical work and their availability for the Forces is judged on the needs of that other work rather than on their first-aid commitments

Admission to Nursing Register

Captain W F **Strickland** asked the Minister whether, in view of the urgent national need, he would introduce any necessary legislation, or take any other emergency measures, to enable retired fully trained nurses, not previously registered under the Nurses Registration Act, 1919, to become so registered after recommendation by the medical profession without the long delay and inconvenience of a period of fresh qualification —Mr **Brown** replied Legislation would be required for the purpose of varying the conditions on which nurses can be admitted to the register I do not think I should be justified in introducing such legislation

Population Estimates

Sir **Francis Fremantle** asked the Minister what were the crude birth- and death rates for England and Wales for 1941 —Mr **Brown** replied the crude live birth- and death rates in question are 14 2 and 12 9 per 1000 population respectively

Sir F **Fremantle** What will be the estimated population of England and Wales in 40 years' and in 100 years' time if birth- and death rates continue at present levels ?—Mr **Brown** A memorandum has been prepared by the Registrar General's department with respect to the estimation of the future population of this country In answer to further questions Mr **Brown** added that when the report was printed some time ago the memorandum was not printed with it He would consider the best way of making it generally available, as the subject was important

Rations in Enemy-occupied Countries

In answer to a question Mr D M **Foot**, parliamentary secretary to the Ministry for Economic Warfare, said that the weekly rations for a normal consumer in Belgium are, bread, 55 oz , meat, 8½ oz , fats, 3½ oz , potatoes, 123 oz , sugar, 8 oz In Greece the weekly bread ration is 37 oz There is no fixed ration for other foodstuffs, which are exceedingly scarce In Poland there is no uniform rationing scheme, since rations vary from place to place, and there is marked discrimination between Germans, Poles, and Jews But the latest figures available for Poles in Warsaw are, bread, 39 oz , meat, 1½ oz , fats, 1 oz , and for Poles in Cracow, bread, 52 oz , meat, 3½ oz , fats, 1 oz , sugar, 4½ oz , groats, 5½ oz In none of these three countries are the published rations always fully available

Food-supplies for Greece

Seven thousand tons of wheat, which had been made available by H M Government and paid for by the Greek Government reached Piraeus in the steamship *Radmanso* during the third week in March I have not yet received a report as to the distribution of this cargo among the Greek people (Mr **Foot** replying to Sir T **Moore**)

Cause and Prevention of Scabies

Mr C G **Ammon** asked the Minister of Health what was the cause of the increase of scabies among the civil population , and what steps were being taken as preventive —Mr **Brown** replied The causes of the increase in scabies are not fully understood Special war time conditions undoubtedly conduce to the spread of the disease but a steady increase in incidence was noted for some years before 1939 Research for which I arranged over a year ago is now being continued by the Medical Research Council and curative and preventive measures based on this research will, I hope, help to reduce the incidence Local authorities, under an order made in October last, received additional powers the object of which was to secure the early ascertainment and treatment of cases of scabies which would otherwise have gone undetected and would have acted as reservoirs for the parasite causing the disease

Scabies in the Army

Mr F J **Bellenger** asked the Under Secretary of State for War what arrangements existed, in view of the prevalence of scabies, to cleanse and sterilise blankets periodically throughout the service —Mr E D **Sandys** replied All army blankets are disinfected every six months and scabies is not confined to the Army The incidence has been increasing among the civilian population More frequent disinfection of blankets has been tried but it has not reduced the incidence of scabies I too am anxious to reduce the incidence of scabies, but I am satisfied that it is not caused by the state of the blankets I understand that it is usually spread through bodily contact and that infection from blankets only accounts for a very small proportion of cases

Distribution and Consumption of Wood Alcohol

Colonel **Arthur Evans** and Sir **Leonard Lyle** asked the Home Secretary what steps he was taking to deal with the growing danger to public health through the illicit distribution in labelled bottles carrying well-known trade names of wood alcohol, or similar spirit substitute —Mr H **Morrison** replied I have been in consultation with the Board of Customs and Excise and the Commissioner for Police, and I find that there has been one case in which a workman stole some wood alcohol and used it to strengthen home made wines which he produced on a small scale He was convicted and sent to prison There have been stories in the Press suggesting the prevalence of such practices but there is no evidence so far forthcoming to support these allegation

Dispensers in the Forces

Mr **Bevin** informed Mr T Kennedy that only suitably qualified men were posted to the Forces by his department for service as dispensers, and the demands from the Services for such men had been substantially met He was informed that it was not the practice of the Services to employ unqualified men in the Service trade of dispenser

Sir **Irving Albery** Is the Minister aware that in the RAF women are being trained to fill these positions ?—Mr **Bevin** I assume that if they are trained and pass a certain standard, they become qualified

Rationing of Pharmaceutical Compounds

Mr W S **Liddall** asked the Minister of Supply whether he was prepared to introduce a rationing scheme for the materials for pharmaceutical compounds, having regard to the shortage of certain of such materials for essential purposes, at a time when they were being used largely for the purpose of manufacturing pre packed drugs which were sold in chain stores —Mr **Charles Peat** replied Control is already exercised over the distribution to manufacturers or wholesalers of some of the materials used in pharmaceutical compounds, and the Minister is considering, in consultation with the Minister of Health, whether control should be extended to certain other materials

Public Health Broadcasts

Mr H **Brooke** asked the Minister of Health whether, in view of the importance of maintaining high standards of national health in war time, he would ask the BBC to arrange more frequently for popular talks on health subjects —Mr **Brown** replied The BBC has arranged to broadcast a new series of weekly health talks every Monday evening beginning on April 13 This series will be in addition to the Health Magazine which is broadcast every Friday morning, and on which the BBC keeps in constant touch with my department

---

BP CHANGES TO SAVE ALCOHOL

In the fifth addendum to the BP, which will shortly be published, a number of modifications have been made to economise in alcohol The main one is the introduction of eleven concentrated tinctures Of these, the following ten are each four times the strength of the ordinary BP tincture (doses in parentheses) concentrated tincture of orange (min 8–15), capsicum (min 1–4), lemon (min 8–15), quassia (min 8–15) and tolu (min 8–15) , concentrated compound tincture of cardamom (min 8–15), cinchona (min 8–15) and gentian (min 8–15) , concentrated ethereal tincture of lobelia (min 1¼–4) , and concentrated ammoniated tincture of valerian (min 8–15) On the other hand, the new concentrated camphorated tincture of opium (min 4–8) is roughly eight times the strength of the ordinary tinct opii camph , and min 8 of it contains about gr 1/30 of morphine In addition to these tinctures the addendum makes official the liquid extracts of quillaia (min 1¼–3) and of squill (min 2–8) of the BPC, and emulsions of chloroform (min 5–30) and of peppermint (min 5–30) which are also to all intents the same as those of the BPC Ext scill liq is roughly ten times the strength of tinct scillæ There is a new concentrated solution of ethyl nitrite (min 2–8) which is about eight times the strength of spirit of nitrous ether, and a new aromatic solution of ammonia (min 15–60) which is nearly the same as that of the BPC and equivalent to sp ammon aromat, in content of ammonia and ammonium carbonate The monograph on menthol has been revised so as to include the synthetic product There is a useful cumulative index to the five addenda

Letters to the Editor

WHAT ARE THE FACTS ?

SIR,—Some years ago a tuberculous patient consulted me on a family problem "Should I agree to my only child becoming a nurse ? You know my history and the care we have always taken to build up the girl's health Is it all right, the hard work and all that ?" As the girl was barely 18 I advised a year's delay and then, if the desire was maintained careful choice of a training school Four years later came the final state examination and I went to it from a heavy night on duty She failed, and explained to her parents she knew it must be so she "just couldn t think" She was greatly cast down by her failure and later the matron, concerned at her appearance, arranged to put forward her summer holiday She joined her mother at a railway terminus, had a violent hæmoptysis before reaching the train and was dead within a month

I hoped this story was atypical but medical colleagues in sanatorium work did not agree One of them who receives the women patients of a large industrial area said, frankly "too many young nurses come here as patients, it's disquieting" Since then inquiries have been held as to employment incidence as regards tuberculosis but figures as to nursing are not forthcoming Why ? Does the shortage of nurses prohibit the disclosure of facts ? The toll of tuberculosis is highest and most persistent among young women at the age of probationer nurses Can employing bodies such as county councils give assurance to the medical profession and the public that there is *no* added risk in nursing as compared with other employments ? Public money and effort are being expended to popularise nursing This would be more effectual if lurking apprehensions about the conditions awaiting recruits were first cleared away Should this not be possible, other questions arise What lessening of undue strain can be arranged ? Perhaps the story with which this letter starts suggests one evil to be eliminated Serial X-ray examination of nurses should be compulsory and much fuller recognition is needed of the fact that study for examinations is incompatible with full-time arduous employment

Establishment of public confidence that nursing offers as reasonable terms of service as other reserved occupations would surely do more to help recruitment than anything else

Moor Park. ESTHER CARLING

FRACTURE OF THE FEMORAL NECK

SIR,—From Mr Haydon-Baillie's letter of April 11 I conclude that he can have had little practical experience with the abduction treatment since he speaks of it as an "ambulatory device" In his opinion "the senile condition of most of the sufferers" would prevent its application, because of the tendency of this class of patients to "break up as the result of such an injury or being put to bed or both renders the patient unable to avail himself of the treatment" He implies therefore that the relief of discomfort "and the avoidance of the liability to fatal hypostatic pulmonary congestion and bedsores' rather than the treatment of the fracture should be the first consideration

Paradoxical as it may seem these are the very arguments that have been urged to support positive treatment. The patient lies in an inclined plane and is turned to the ventral posture systematically It may be emphasised that the ' Whitman plaster " is not a splint for the fracture but is a means of supporting the limb in the attitude that makes the anatomical splinting effective, thus in its application the first concern is the comfort of the patient In my experience this treatment, which relieves pain, permits changes of attitude and transportation to the open air, and which above all presents a prospect of recovery as contrasted with inevitable disability is the most conservative treatment, even of the aged In fact contrary to the prevailing opinion these patients are very amenable to "bed treatment," and their physical condition often improves during the period of enforced rest Of 441 cases of medial fracture treated by this method, reported by several observers, 126 were over 70 years of age, 57 over 80 and one successful case has been reported at 102 I conclude that the evidence at command justifies the statement that the abduction method has made treatment in accord with surgical principles practicable and effective in the great majority of the cases

The Athenaeum ROYAL WHITMAN

ANOXÆMIA AS A TEST FOR CORONARY DISEASE

SIR —To your short leader on coronary disease (March 28, p 388), dealing with anoxæmia as a diagnostic test, may I add a cautionary tale for anæsthetists, and an illustration of the danger of inducing anoxæmia as a test

I gave a nitrous-oxide and oxygen anæsthetic to a woman of 55 for the removal of two teeth Early induction was with 95% nitrous oxide and the rest of the anæsthesia, lasting about three minutes, was with 90% nitrous oxide and 10% oxygen, given with a McKesson apparatus The extraction was effected easily and gently, at no time was there cyanosis jactitation, struggling or excitement Return to consciousness was moderately rapid but was accompanied by dyspnœa, mid-chest pain and pallor These symptoms persisted and three days later the diagnosis of coronary occlusion was confirmed by an electrocardiograph Recovery proceeded uneventfully.

Upon inquiry it was learned that this patient had considerable hyperpiesia (BP 225/120, 230/140) and arteriosclerotic retinal vessels There was no previous history of anginal pain As her hæmoglobin content was normal, the absence of cyanosis is positive proof of the limited degree of anoxæmia Excluding accidental association, and factors such as excitement and shock for which there appeared to be little evidence, it seems evident that the sudden disaster was due to the anoxæmia of nitrous-oxide anæsthesia acting on an already sclerotic coronary vessel This case also illustrates the necessity for clinical interrogation and examination before anæsthesia, even for so-called minor anæsthetics

London, N W 8 S CHARLES LEWSEN

CASE HISTORY IN DIAGNOSIS

SIR,—I find it difficult to visualise the state of perfection insisted on by Dr Plesch in your issue of Nov. 15, 1941 (p 623), for my many medical friends are but human And what exactly does he mean when he says "If we do not discuss his case with the patient we bring medicine to the level of veterinary medicine" ? That one cannot converse with an animal is of course true but he goes on to point out the importance of "inspection' or in other words the faculty of observing closely and accurately This power of observation is of even greater importance to the veterinary clinician than to his opposite number in human medicine because he cannot get a case history direct from his patient and must therefore rely more on observation and deduction In the case of children I presume Dr Plesch in addition to "inspection" obtains his information from the parent or whoever is in charge, which is exactly what we endeavour to do in veterinary medicine, and I venture to think he would find getting at the truth by "clever" cross-examination (let alone psycho-analysis) of a British farmer about his stock not so easy At all events he could have made his points clear without disparaging veterinary medicine which is a branch of our mutual mother science

Veterinary Laboratory, Entebbe J CARMICHAEL.

RESUSCITATION IN SHOCK

SIR,—The recent correspondence on shock seems to show that a little interest is at last being taken in this important subject Dr Dunlop and Mr Paramore both criticise the modern tendency to indiscriminate blood-transfusion I absolutely agree with them In the *Lancet* of Jan. 2, 1937 (p 6), I published some observations on blood changes after operations and came to certain conclusions, some of which I should like to quote. "The best method of fluid replacement if the oral route is contra-indicated is per rectum . . . Since pulmonary œdema may result from abnormally low percentage of protein in the plasma, and since intravenous fluids tend to lower this percentage, the level of the plasma protein should be ascertained before giving fluid intravenously. . . Owing to the danger from protein loss, emergency treatment of postoperative shock should preferably consist in intravenous infusion of plasma. . . Blood-practice or other medical work and their availability for the Forces is judged on the needs of that other work rather than on their first aid commitments

Admission to Nursing Register

Captain W F **Strickland** asked the Minister whether, in view of the urgent national need, he would introduce any necessary legislation, or take any other emergency measures, to enable retired fully trained nurses, not previously registered under the Nurses Registration Act, 1919, to become so registered after recommendation by the medical profession without the long delay and inconvenience of a period of fresh qualification —Mr **Brown** replied Legislation would be required for the purpose of varying the conditions on which nurses can be admitted to the register I do not think I should be justified in introducing such legislation

Population Estimates

Sir **Francis Fremantle** asked the Minister what were the crude birth and death rates for England and Wales for 1941 —Mr **Brown** replied the crude live birth- and death-rates in question are 14 2 and 12 9 per 1000 population respectively

Sir F **Fremantle** What will be the estimated population of England and Wales in 40 years' and in 100 years' time if birth- and death rates continue at present levels ?—Mr **Brown** A memorandum has been prepared by the Registrar-General's department with respect to the estimation of the future population of this country In answer to further questions Mr **Brown** added that when the report was printed some time ago the memorandum was not printed with it He would consider the best way of making it generally available, as the subject was important

Rations in Enemy-occupied Countries

In answer to a question Mr D M **Foot**, parliamentary secretary to the Ministry for Economic Warfare, said that the weekly rations for a normal consumer in Belgium are, bread, 55 oz , meat, 8½ oz , fats, 3½ oz , potatoes, 123 oz , sugar, 8 oz In Greece the weekly bread ration is 37 oz There is no fixed ration for other foodstuffs, which are exceedingly scarce In Poland there is no uniform rationing scheme, since rations vary from place to place, and there is marked discrimination between Germans, Poles, and Jews But the latest figures available for Poles in Warsaw are, bread, 39 oz , meat, 1½ oz , fats, 1 oz , and for Poles in Cracow, bread, 52 oz , meat, 3½ oz , fats, 1 oz , sugar, 4½ oz , groats, 5½ oz. In none of these three countries are the published rations always fully available

Food-supplies for Greece

Seven thousand tons of wheat, which had been made available by H M Government and paid for by the Greek Government reached Piraeus in the steamship *Radmanso* during the third week in March I have not yet received a report as to the distribution of this cargo among the Greek people (Mr **Foot** replying to Sir T **Moore**)

Cause and Prevention of Scabies

Mr C G **Ammon** asked the Minister of Health what was the cause of the increase of scabies among the civil population , and what steps were being taken as preventive —Mr **Brown** replied The causes of the increase in scabies are not fully understood Special war time conditions undoubtedly conduce to the spread of the disease but a steady increase in incidence was noted for some years before 1939 Research for which I arranged over a year ago is now being continued by the Medical Research Council and curative and preventive measures based on this research will, I hope, help to reduce the incidence Local authorities, under an order made in October last, received additional powers the object of which was to secure the early ascertainment and treatment of cases of scabies which would otherwise have gone undetected and would have acted as reservoirs for the parasite causing the disease

Scabies in the Army

Mr F J **Bellenger** asked the Under Secretary of State for War what arrangements existed, in view of the prevalence of scabies, to cleanse and sterilise blankets periodically throughout the service —Mr E D **Sandys** replied All army blankets are disinfected every six months and scabies is not confined to the Army The incidence has been increasing among the civilian population More frequent disinfection of blankets has been tried but it has not reduced the incidence of scabies I too am anxious to reduce the incidence of scabies, but I am satisfied that it is not caused by the state of the blankets I understand that it is usually spread through bodily contact and that infection from blankets only accounts for a very small proportion of cases

Distribution and Consumption of Wood Alcohol

Colonel **Arthur Evans** and Sir **Leonard Lyle** asked the Home Secretary what steps he was taking to deal with the growing danger to public health through the illicit distribution in labelled bottles carrying well known trade names of wood alcohol, or similar spirit substitute —Mr H **Morrison** replied I have been in consultation with the Board of Customs and Excise and the Commissioner for Police, and I find that there has been one case in which a workman stole some wood alcohol and used it to strengthen home made wines which he produced on a small scale He was convicted and sent to prison There have been stories in the Press suggesting the prevalence of such practices but there is no evidence so far forthcoming to support these allegations

Dispensers in the Forces

Mr **Bevin** informed Mr T Kennedy that only suitably qualified men were posted to the Forces by his department for service as dispensers, and the demands from the Services for such men had been substantially met He was informed that it was not the practice of the Services to employ unqualified men in the Service trade of dispenser

Sir **Irving Albery** Is the Minister aware that in the RAF women are being trained to fill these positions ?—Mr **Bevin** I assume that if they are trained and pass a certain standard, they become qualified

Rationing of Pharmaceutical Compounds

Mr W S **Liddall** asked the Minister of Supply whether he was prepared to introduce a rationing scheme for the materials for pharmaceutical compounds, having regard to the shortage of certain of such materials for essential purposes, at a time when they were being used largely for the purpose of manufacturing pre packed drugs which were sold in chain stores —Mr **Charles Peat** replied Control is already exercised over the distribution to manufacturers or wholesalers of some of the materials used in pharmaceutical compounds, and the Minister is considering, in consultation with the Minister of Health, whether control should be extended to certain other materials

Public Health Broadcasts

Mr H **Brooke** asked the Minister of Health whether, in view of the importance of maintaining high standards of national health in war-time, he would ask the BBC to arrange more frequently for popular talks on health subjects —Mr **Brown** replied The BBC has arranged to broadcast a new series of weekly health talks every Monday evening beginning on April 13 This series will be in addition to the Health Magazine which is broadcast every Friday morning, and on which the BBC keeps in constant touch with my department

---

BP CHANGES TO SAVE ALCOHOL

In the fifth addendum to the BP, which will shortly be published, a number of modifications have been made *to economise in alcohol* The main one is the introduction of eleven concentrated tinctures Of these, the following ten are each four times the strength of the ordinary BP tincture (doses in parentheses) concentrated tincture of orange (min 8–15), capsicum (min 1–4), lemon (min 8–15), quassia (min 8–15) and tolu (min 8–15), concentrated compound tincture of cardamom (min 8–15), cinchona (min 8–15) and gentian (min 8–15), concentrated ethereal tincture of lobelia *(min 1⅓–4), and concentrated* ammoniated tincture of valerian (min 8–15) On the other hand, the new concentrated camphorated tincture of opium (min 4–8) is roughly eight times the strength of the ordinary tinct *opii camph , and min 8 of it contains* about gr 1/30 of morphine In addition to these tinctures the addendum makes official the liquid extracts of quillaia (min 1½–3) and of squill (min 2–8) of the BPC, and emulsions of chloroform (min 5–30) and of peppermint (min 5–30) which are also to all intents the same as those of the BPC Ext scill liq is roughly ten times the strength of tinct scillæ There is a new concentrated solution of ethyl nitrite (min 2–8) which is about eight times the strength of spirit of nitrous ether, and a new aromatic solution of ammonia (min 15–60) which is nearly the same as that of the BPC and equivalent to sp ammon. aromat, in content of ammonia and ammonium carbonate The monograph on menthol has been revised so as to include the synthetic product There is a useful cumulative index to the five addenda

Letters to the Editor

WHAT ARE THE FACTS?

SIR,—Some years ago a tuberculous patient consulted me on a family problem "Should I agree to my only child becoming a nurse? You know my history and the care we have always taken to build up the girl's health. Is it all right the hard work and all that?" As the girl was barely 18 I advised a year's delay and then, if the desire was maintained careful choice of a training school Four years later came the final state examination and X went to it from a heavy night on duty She failed, and explained to her parents she knew it must be so she "just couldn't think." She was greatly cast down by her failure and later the matron, concerned at her appearance, arranged to put forward her summer holiday She joined her mother at a railway terminus, had a violent hæmoptysis before reaching the train, and was dead within a month

I hoped this story was atypical but medical colleagues in sanatorium work did not agree One of them who receives the women patients of a large industrial area said, frankly "too many young nurses come here as patients, it's disquieting" Since then inquiries have been held as to employment incidence as regards tuberculosis but figures as to nursing are not forthcoming Why? Does the shortage of nurses prohibit the disclosure of facts? The toll of tuberculosis is highest and most persistent among young women at the age of probationer nurses Can employing bodies such as county councils give assurance to the medical profession and the public that there is *no* added risk in nursing as compared with other employments? Public money and effort are being expended to popularise nursing This would be more effectual if lurking apprehensions about the conditions awaiting recruits were first cleared away Should this not be possible, other questions arise What lessening of *undue strain can be arranged?* Perhaps the story with which this letter starts suggests one evil to be eliminated Serial X-ray examination of nurses should be compulsory and much fuller recognition is needed of the fact that study for examinations is incompatible with full-time arduous employment

Establishment of public confidence that nursing offers as reasonable terms of service as other reserved occupations would surely do more to help recruitment than anything else

Moor Park ESTHER CARLING

FRACTURE OF THE FEMORAL NECK

SIR,—From Mr Haydon-Baillie's *letter of April 11* I conclude that he can have had little practical experience with the abduction treatment since he speaks of it as an "ambulatory device" In his opinion "the senile condition of most of the sufferers" would prevent its application, because of the tendency of this class of patients to "break up as the result of such an injury or being put to bed or both renders the patient unable to avail himself of the treatment" He implies therefore that the relief of discomfort "and the avoidance of the liability to fatal hypostatic pulmonary congestion and bedsores" rather than the treatment of the fracture should be the first consideration

Paradoxical as it may seem these are the very arguments that have been urged to support positive treatment The patient lies in an inclined plane and is turned to the ventral posture systematically. It may be emphasised that the "*Whitman plaster*" *is not a splint* for the fracture but is a means of supporting the limb *in* the attitude that makes the anatomical splinting effective, thus in its application the first concern is the comfort of the patient In my experience this treatment, which relieves pain, permits changes of attitude and transportation to the open air, and which above all presents a prospect of recovery as contrasted with inevitable disability is the most conservative treatment, even of the aged In fact contrary to the prevailing opinion these patients are *very amenable to* "bed treatment," and their physical condition often improves during the period of enforced rest Of 441 cases of medial fracture treated by this method, reported by several observers, 126 were over 70 years of age, 57 over 80 and one successful case has been *reported at 102* I conclude *that the evidence at command justifies the statement* that the abduction method has made treatment in accord with surgical principles practicable and effective in the great majority of the cases

The Athenaeum ROYAL WHITMAN

ANOXÆMIA AS A TEST FOR CORONARY DISEASE

SIR,—*To your short leader on coronary disease (March 28, p 388) dealing with anoxæmia as a diagnostic test,* may I add a cautionary tale for anæsthetists, and an illustration of the danger of inducing anoxæmia as a test

I gave a nitrous-oxide and oxygen anæsthetic to a woman of 55 for the removal of two teeth Early induction was with 95% nitrous oxide and the rest of the anæsthesia, *lasting about three minutes* was with 90% *nitrous oxide and 10% oxygen, given with a* McKesson apparatus *The extraction was effected easily and gently, at no time was there cyanosis jactitation, struggling or excitement* Return to consciousness was moderately rapid but was accompanied by dyspnœa, mid-chest pain and pallor These symptoms persisted and three days later the diagnosis of coronary occlusion was confirmed by an electrocardiograph Recovery proceeded uneventfully.

Upon inquiry it was learned that this patient had considerable hyperpiesia (BP 225/120, 230/140) and arteriosclerotic retinal vessels There was no previous history of anginal pain. As her hæmoglobin content was normal the absence of cyanosis is positive proof of the limited degree of anoxæmia Excluding accidental *association and factors such as excitement and shock for which there appeared to be little evidence, it seems* evident that the sudden disaster was due to the anoxæmia of nitrous-oxide anæsthesia acting on an already sclerotic coronary vessel This case also illustrates the necessity for clinical interrogation and examination before anæsthesia, even for so-called minor anæsthetics

London, N W 8 S. CHARLES LEWSEN

CASE HISTORY IN DIAGNOSIS

SIR,—I find it difficult to visualise the state of perfection insisted on by Dr Plesch in your issue of Nov 15, 1941 (p 623); for my many medical friends are but human And what exactly does he mean when he says "If we do not discuss his case with the patient we bring medicine to the level of veterinary medicine"? That one cannot converse with an animal is of course true but he goes on to point out the importance of "inspection" or in other words the faculty of observing closely and accurately This power of observation is of even greater importance to the veterinary clinician than to his *opposite number in human medicine because he cannot get a case history direct from his patient and must therefore* rely more on observation and deduction In the case of children I presume Dr. Plesch in addition to "inspection" obtains his information from the parent or whoever is in charge, which is exactly what we endeavour to do in veterinary medicine, and I venture to think he would find getting at the truth by "clever" cross-examination (let alone psycho-analysis) of a British farmer about his stock not so easy At all events he could have made his points clear without disparaging veterinary medicine which is a branch of our mutual mother science

Veterinary Laboratory, Entebbe J CARMICHAEL.

RESUSCITATION IN SHOCK

SIR,—The recent correspondence on shock seems to *show that a little interest is at last being taken in this important subject Dr Dunlop and Mr Paramore both criticise the modern tendency to indiscriminate blood-*transfusion. I absolutely agree with them. In the *Lancet* of Jan 2 1937 (p 6), I published some observations on blood changes after operations and came to certain conclusions, some of which I should like to quote "The best method of fluid replacement if the oral route is contra-indicated is per rectum . . . Since pulmonary œdema may result from abnormally low percentage of protein in the plasma, and since intravenous fluids tend to lower this percentage, the level of the plasma protein should be ascertained before giving fluid intravenously. . . Owing to the danger *from protein loss,* emergency treatment of postoperative shock should preferably consist in intravenous infusion of plasma. . . Blood-practice or other medical work and their availability for the Forces is judged on the needs of that other work rather than on their first aid commitments

Admission to Nursing Register

Captain W F **Strickland** asked the Minister whether, in view of the urgent national need, he would introduce any necessary legislation, or take any other emergency measures, to enable retired fully trained nurses, not previously registered under the Nurses Registration Act, 1919, to become so registered after recommendation by the medical profession without the long delay and inconvenience of a period of fresh qualification —Mr **Brown** replied Legislation would be required for the purpose of varying the conditions on which nurses can be admitted to the register I do not think I should be justified in introducing such legislation

Population Estimates

Sir **Francis Fremantle** asked the Minister what were the crude birth- and death rates for England and Wales for 1941 —Mr **Brown** replied the crude live birth- and death rates in question are 14 2 and 12 9 per 1000 population respectively

Sir F **Fremantle** What will be the estimated population of England and Wales in 40 years' and in 100 years' time if birth- and death rates continue at present levels?—Mr **Brown** A memorandum has been prepared by the Registrar-General's department with respect to the estimation of the future population of this country In answer to further questions Mr **Brown** added that when the report was printed some time ago the memorandum was not printed with it He would consider the best way of making it generally available, as the subject was important

Rations in Enemy-occupied Countries

In answer to a question Mr D M **Foot**, parliamentary secretary to the Ministry for Economic Warfare, said that the weekly rations for a normal consumer in Belgium are, bread, 55 oz , meat, 8½ oz , fats, 3½ oz , potatoes, 123 oz , sugar, 8 oz In Greece the weekly bread ration is 37 oz There is no fixed ration for other foodstuffs, which are exceedingly scarce In Poland there is no uniform rationing scheme, since rations vary from place to place, and there is marked discrimination between Germans, Poles, and Jews But the latest figures available for Poles in Warsaw are, bread, 39 oz , meat, 1½ oz , fats, 1 oz , and for Poles in Cracow, bread, 52 oz , meat, 3½ oz , fats, 1 oz. , sugar, 4½ oz , groats, 5½ oz In none of these three countries are the published rations always fully available

Food-supplies for Greece

Seven thousand tons of wheat, which had been made available by H M Government and paid for by the Greek Government reached Piraeus in the steamship *Radmanso* during the third week in March I have not yet received a report as to the distribution of this cargo among the Greek people (Mr **Foot** replying to Sir T **Moore**)

Cause and Prevention of Scabies

Mr C G **Ammon** asked the Minister of Health what was the cause of the increase of scabies among the civil population , and what steps were being taken as preventive —Mr **Brown** replied The causes of the increase in scabies are not fully understood Special war time conditions undoubtedly conduce to the spread of the disease but a steady increase in incidence was noted for some years before 1939 Research for which I arranged over a year ago is now being continued by the Medical Research Council and curative and preventive measures based on this research will, I hope, help to reduce the incidence Local authorities, under an order made in October last, received additional powers the object of which was to secure the early ascertainment and treatment of cases of scabies which would otherwise have gone undetected and would have acted as reservoirs for the parasite causing the disease

Scabies in the Army

Mr F J **Bellenger** asked the Under Secretary of State for War what arrangements existed, in view of the prevalence of scabies, to cleanse and sterilise blankets periodically throughout the service —Mr E D **Sandys** replied All army blankets are disinfected every six months and scabies is not confined to the Army The incidence has been increasing among the civilian population More frequent disinfection of blankets has been tried but it has not reduced the incidence of scabies I too am anxious to reduce the incidence of scabies, but I am satisfied that it is not caused by the state of the blankets I understand that it is usually spread through bodily contact and that infection from blankets only accounts for a very small proportion of cases

Distribution and Consumption of Wood Alcohol

Colonel **Arthur Evans** and Sir **Leonard Lyle** asked the Home Secretary what steps he was taking to deal with the growing danger to public health through the illicit distribution in labelled bottles carrying well known trade names of wood alcohol, or similar spirit substitute —Mr H **Morrison** replied I have been in consultation with the Board o Customs and Excise and the Commissioner for Police, and I find that there has been one case in which a workman stole some wood alcohol and used it to strengthen home made wines which he produced on a small scale He was convicted and sent to prison There have been stories in the Pre suggesting the prevalence of such practices but there is no evidence so far forthcoming to support these allegations

Dispensers in the Forces

Mr **Bevin** informed Mr T Kennedy that only suitable qualified men were posted to the Forces by his department fo service as dispensers, and the demands from the Services fo such men had been substantially met He was informed that it was not the practice of the Services to employ unqualified men in the Service trade of dispenser

Sir **Irving Albery** Is the Minister aware that in the RAF women are being trained to fill these positions?—Mr **Bevin** I assume that if they are trained and pass a certain standard, they become qualified

Rationing of Pharmaceutical Compounds

Mr W S **Liddall** asked the Minister of Supply whether he was prepared to introduce a rationing scheme for the materials for pharmaceutical compounds, having regard to the shortage of certain of such materials for essential purposes, at a time when they were being used largely for the purpose of manufacturing pre packed drugs which were sold in chain stores —Mr **Charles Peat** replied Control is already exercised over the distribution to manufacturers or wholesalers of some of the materials used in pharmaceutical compounds, and the Minister is considering, in consultation with the Minister of Health, whether control should be extended to certain other materials

Public Health Broadcasts

Mr H **Brooke** asked the Minister of Health whether, in view of the importance of maintaining high standards of national health in war-time, he would ask the BBC to arrange more frequently for popular talks on health subjects —Mr **Brown** replied The BBC has arranged to broadcast a new series of weekly health talks every Monday evening beginning on April 13 This series will be in addition to the Health Magazine which is broadcast every Friday morning, and on which the BBC keeps in constant touch with my department

---

BP CHANGES TO SAVE ALCOHOL

In the fifth addendum to the BP, which will shortly be published, a number of modifications have been made to economise in alcohol The main one is the introduction of eleven concentrated tinctures Of these, the following ten are each four times the strength of the ordinary BP tincture (doses in parentheses) concentrated tincture of orange (min 8–15), capsicum (min 1–4), lemon (min 8–15), quassia (min 8–15) and tolu (min 8–15) , concentrated compound tincture of cardamom (min 8–15), cinchona (min 8–15) and gentian (min 8–15) , concentrated ethereal tincture of lobelia (min 1¼–4) , and concentrated ammoniated tincture of valerian (min 8–15) On the other hand, the new concentrated camphorated tincture of opium (min 4–8) is roughly eight times the strength of the ordinary tinct opii camph , and min 8 of it contains about gr 1/30 of morphine In addition to these tinctures the addendum makes official the liquid extracts of quillaia (min 1¼–3) and of squill (min 2–8) of the BPC, and emulsions of chloroform (min 5–30) and of peppermint (min 5–30) which are also to all intents the same as those of the BPC Ext scill liq is roughly ten times the strength of tinct scillæ There is a new concentrated solution of ethyl nitrite (min 2–8) which is about eight times the strength of spirit of nitrous ether, and a new aromatic solution of ammonia (min 15–60) which is nearly the same as that of the BPC and equivalent to sp aromat, in content of ammonia and ammonium carbonate The monograph on menthol has been revised so to include the synthetic product There is a cumulative index to the five addenda

Letters to the Editor

WHAT ARE THE FACTS ?

SIR,—Some years ago a tuberculous patient consulted me on a family problem "Should I agree to my only child becoming a nurse ? You know my history and the care we have always taken to build up the girl's health Is it *all right, the hard work and all that* ? " *As the girl* was barely 18 I advised a year's delay and then, if the desire was maintained, careful choice of a training school Four years later came the final state examination and X went to it from a heavy night on duty She failed, and explained to her parents, she knew it must be so she " just couldn't think " She was greatly cast down by her failure and later the matron, concerned at her appearance, arranged to put forward her summer holiday She joined her mother at a railway terminus, had a violent hæmoptysis before reaching the train, and was dead within a month

I hoped this story was atypical but medical colleagues in sanatorium work did not agree One of them who receives the women patients of a large industrial area said, frankly " too many young nurses come here as patients, it's disquieting " Since then inquiries have been held as to employment incidence as regards tuberculosis but figures as to nursing are not forthcoming Why ? Does the shortage of nurses prohibit the disclosure of facts ? The toll of tuberculosis is highest and most persistent among young women at the age of probationer nurses *Can employing bodies such as* county councils give assurance to the medical profession and the public that there is *no* added risk in nursing as compared with other employments ? Public money and effort are being expended to popularise nursing This would be more effectual if lurking apprehensions about the conditions awaiting recruits were first cleared away Should this not be possible, other questions arise What lessening of undue strain can be arranged ? Perhaps the story with which this letter starts suggests one evil to be eliminated Serial X-ray examination of nurses *should be compulsory and much fuller recognition* is needed of the fact that study for examinations is incompatible with full-time arduous employment

Establishment of public confidence that nursing offers as reasonable terms of service as other reserved occupations would surely do more to help recruitment than anything else

Moor Park ESTHER CARLING

FRACTURE OF THE FEMORAL NECK

SIR,—From Mr Haydon-Baillie's letter of April 11 I conclude that he can have had little practical experience with the abduction treatment since he speaks of it as an " ambulatory device " In his opinion " the senile condition of most of the sufferers " would prevent its application, because of the tendency of this class of patients to " break up as the result of such an injury or being put to bed or both renders the patient unable to avail himself of the treatment " He implies therefore that the relief of discomfort " and the avoidance of the liability to fatal hypostatic pulmonary congestion and bedsores " rather than the treatment of the fracture should be the first consideration

Paradoxical as it may seem these are the very arguments that have been urged to support positive treatment The patient lies in an inclined plane and is turned to the ventral posture systematically It may be emphasised that the " Whitman plaster " is not a splint for the fracture but is a means of supporting the limb in the attitude that makes the anatomical splinting effective, thus in its application *the first concern is the comfort* of the patient In my experience this treatment, which relieves pain, permits changes of attitude and transportation to the open air, and which above all presents a prospect of recovery *as contrasted* with inevitable disability is the most conservative treatment, even of the aged In fact contrary to the prevailing opinion these patients are very amenable to " bed treatment," and their physical condition often improves during the period of enforced rest Of 141 cases of medial fracture treated by this method, reported by several observers, 126 were over 70 years of age, 57 over 80 and one successful case has been reported at 102 I conclude that the evidence at command justifies the statement, that the abduction method has made treatment in accord with surgical principles practicable and effective in the great majority of the cases

The Athenaeum ROYAL WHITMAN

ANOXÆMIA AS A TEST FOR CORONARY DISEASE

SIR,—To your short leader on coronary disease (March 28, p 388), dealing with anoxæmia as a diagnostic test, may I add a cautionary tale for anæsthetists, and an illustration of the danger of inducing anoxæmia as a test

I gave a *nitrous-oxide and oxygen anæsthetic* to a woman of 55 for the removal of two teeth Early induction was with 95% nitrous oxide and the rest of the anæsthesia, lasting about three minutes, was with 90% nitrous oxide and 10% oxygen, given with a McKesson apparatus The extraction was effected easily and gently, at no time was there cyanosis, jactitation, struggling or excitement Return to consciousness was *moderately rapid but was accompanied by dyspnœa,* mid-chest pain and pallor These symptoms persisted and three days later the diagnosis of coronary occlusion was *confirmed* by an electrocardiograph Recovery proceeded uneventfully

Upon inquiry it was learned that this patient had considerable hyperpiesia (BP 225/120, 230/140) and arteriosclerotic retinal vessels There was no previous history of anginal pain As her hæmoglobin content was normal, the absence of cyanosis is positive proof of the limited degree of anoxæmia Excluding accidental *association, and factors such as excitement and shock* for which there appeared to be little evidence, it seems evident that the sudden disaster was due to the anoxæmia of nitrous-oxide anæsthesia acting on an already sclerotic coronary vessel This case also illustrates the necessity for clinical interrogation and examination before anæsthesia, even for so-called minor anæsthetics

London, N W 8 S CHARLES LEWSEN

CASE HISTORY IN DIAGNOSIS

SIR,—I find it difficult to visualise the state of perfection insisted on by Dr Plesch in your issue of Nov 15, 1941 (p 623), for my many medical friends are but human And what exactly does he mean when he says " If we do not discuss his case with the patient we bring medicine to the level of veterinary medicine " ? That one cannot converse with an animal is of course true but he goes on to point out the importance of " inspection " or *in other words the faculty* of observing closely and accurately This power of observation is of even greater importance to the veterinary clinician than to his opposite number in human medicine because he cannot get a case history *direct from his patient* and must therefore rely more on observation and deduction In the case of children I presume Dr Plesch in addition to " inspection " obtains his information from the parent or whoever is in charge, which is exactly what we endeavour to do in veterinary medicine, and I venture to think he would find getting at the truth by " clever " cross-examination (let alone psycho-analysis) of a British farmer about his stock not so easy At all events he could have made his points clear without disparaging veterinary medicine which is a branch of our mutual mother science

Veterinary Laboratory, Entebbe J CARMICHAEL.

RESUSCITATION IN SHOCK

SIR,—The recent correspondence on shock seems to show that a little interest is at last being taken in this important subject Dr Dunlop and Mr Paramore both criticise the modern tendency to indiscriminate blood-transfusion I absolutely agree with them In the *Lancet* of Jan 2, 1937 (p 6), I published some observations on blood changes after operations and came to certain conclusions, some of which I should like to quote " The best *method* of fluid replacement if the oral route is contra-indicated is per rectum . Since pulmonary œdema may result from abnormally low percentage of protein in the plasma, and since intravenous fluids tend to lower this percentage, the level of the plasma protein should be ascertained before giving fluid intravenously.

. Owing to the danger from protein loss, emergency treatment of postoperative shock should preferably consist in intravenous infusion of plasma. Blood-

Notes, Comments and Abstracts

GIFTS FOR THE RCS MUSEUM

In addition to the many offers of help towards the restoration of the museum of the Royal College of Surgeons which have already been announced, some notable gifts and promises have recently been received The council of the University of Manchester, on the suggestion of Prof Wood Jones, has presented the specimens assembled and prepared by the late Prof Morrison Watson to illustrate Hunterian ideals The medical committees of the Royal Cancer Hospital and of St Mark's Hospital have presented specimens illustrating different forms of malignant disease The Royal Australasian College of Surgeons is arranging for hospitals throughout Australia and New Zealand to collect specimens illustrating pathological conditions common in those countries and seldom met with in the British Isles The specimens will be stored in the different hospitals and presented to the English college after the war The authorities of the Institute of Anatomy at Canberra have earmarked a considerable number of duplicate specimens for transfer to England and have promised that after the war they will organise expeditions to collect specimens of those rare marsupials and monotremes of which they do not possess duplicates The High Commissioner for New Zealand has interested his Prime Minister in the restoration of the museum and the Minister of Health for the Dominion is enlisting the help of New Zealand surgeons in the collection of specimens Sir Ali Ibrahim Pasha, rector of the Egyptian University, Prof S Azmi Pasha, dean of the faculty of medicine, have also sent assurances that Egyptian surgeons will arrange for the collection of specimens illustrating diseases not met with in Great Britain

TEACHING ABOUT VERMIN

School teachers are familiar with the forms of vermin that trouble their pupils and are well able to inculcate sound hygienic ideas into the minds of the next generation At the instance of the Liverpool education committee, Dr Raymond Gamlin has drawn up a pamphlet, which deals with lice, bugs and scabies, to be circulated to all elementary school teachers in the city This entirely fulfils its purpose Avoiding technicalities, it gives full information including the results of recent research From cover to cover emphasis is laid on the cleanliness which is the first line of defence against vermin, with the exception perhaps of the itch mite, which can hardly be dislodged by washing or scrubbing The illustrations are clear enough to identify the various parasites Other education committees might well follow suit

---

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED APRIL 11

Notifications —The following cases of infectious disease were notified during the week smallpox, 0 , scarlet fever, 939 , whooping-cough, 1269 , diphtheria, 736 , paratyphoid, 6 , typhoid, 3 , measles (excluding rubella), 3757 , pneumonia (primary or influenzal), 1089 , puerperal pyrexia, 187 , cerebrospinal fever, 199 , poliomyelitis, 2 , encephalitis lethargica, 5 , dysentery, 168 , ophthalmia neonatorum, 73 No case of cholera, plague or typhus fever was notified during the week

The number of civilian and service sick in the Infectious Hospitals of the London County Council on April 8 was 1514, including scarlet fever, 119 , diphtheria, 195 , measles, 152 , whooping cough, 504 , enteritis, 58 , chicken pox, 68 erysipelas, 33 , mumps, 78 poliomyelitis, 1 , dysentery, 33 cerebrospinal fever, 31 , puerperal sepsis 21 , enteric fevers 8 , german measles, 8 glandular fever, 3 , other diseases (non infectious), 105 , not yet diagnosed, 97

Deaths —In 126 great towns there were no deaths from enteric fevers, 1 (0) from scarlet fever, 3 (0) from measles, 14 (2) from whooping-cough, 25 (0) from diphtheria, 37 (6) from diarrhœa and enteritis under 2 years, and 33 (2) from influenza The figures in parentheses are those for London itself

Liverpool reported 4 deaths from diphtheria There were 6 fatal cases of diarrhœa at Birmingham

The number of stillbirths notified during the week was 253 (corresponding to a rate of 42 per thousand total births), including 24 in London.

Medical News

Medical Honours

The following awards have been made to medical men for distinguished services in Middle East between July and October of last year

O B E —Temp Colonel R P Cormack, M B Edin , R A M C , and Lieut Colonel Ram Nath Khosla, M B Punjab, I M S

M B E —Captain (temp Major) M M Medino, L M S P E I, R A M C , and Captain A D Picton, B M Oxfd, R A M C

M C —Captain (acting Major) R J Niven, M B Lond , R.A M C

The King has given authority to Major John Gilmour, F R C S E , R A M C , to wear the insignia of grand officer of the Order of Ismail which the King of Egypt has conferred on him in recognition of his services as president of the Egyptian sanitary quarantine board

Medical Casualties

Major W J E Phillips, M B Camb , R.A M C , and Captain L D Stone, M R C S , R.A M C , have been posted as missing since the fall of Singapore Lieut Colonel John Huston, M B Belf , R A M C , is reported missing in Malaya Dr Elizabeth Le Sucur and Dr E M Marjoribanks are missing, believed to be prisoners in Sarawak

Medical Society of London

Surgeon Rear Admiral G Gordon-Taylor will deliver his presidential address at 5 P M on Friday, April 27, at 11, Chandos Street, W 1 He will speak on amputations

Royal Society of Medicine

Mr D Greer Walker will read a paper to the section of odontology on Monday, April 27, at 4 30 P M He will discuss whether teeth and comminuted bone should be removed in fractured jaws At the section of otology on May 1 at 10 30 A M , Mr D W C Northfield and Mr Terence Cawthorne will open a discussion on brain atlas The section of laryngology and otology will hold a clinic pathological meeting at 2 30 P M on the same day The section of anæsthetics is also meeting at 2 30 P M on that day when Flight Lieutenant E A Pask will read a paper on convulsions

Ophthalmological Society of the United Kingdom

The annual congress will be held on May 29 and 30 at 1, Wimpole Street, London, W 1 At the Friday morning session Major G I Scott and Mr Arnold Sorsby will open a discussion on the value of sulphonamides in ophthalmology On the Saturday morning Dr Raymond Greene and Mr F A Williamson Noble will introduce on the rôle of vitamins in ophthalmology Further information from the acting hon secretary, Mr Frank Law, 36, Devonshire Place, W 1

Our Daily Break

Two Bradford firms have agreed to lend some of their employees for an hour every day to the Board of Education to test the effect of a break with physical training on health and work A physical training teacher lent by the Bradford education committee will hold classes daily at schools near the works, which the selected employees, girls of 16–18, will attend After six months their records for health and output will be compared with those of control groups of their colleagues who have not taken part in the classes The programme will include exercises, training with apparatus, swimming and games such as basket ball, and the girls will also be medically examined The Medical Research Council is cooperating with the board in arranging the investigation and a similar scheme has already been begun at Gateshead

London will Spend

During 1942–43 the London County Council plans to spend £6,123,385 on its hospitals and medical services This decrease of over £1,093,000 compared with last year is mainly due to the reduction of bed accommodation owing to enemy action and the restrictions imposed by rationing The estimate for expenditure on mental hospitals is £4,347,665, an increase of over £224,000 The social welfare committee expect to spend £1,830,640, a reduction of over £249,000 due to the fall in the number of people on relief Owing to difficulties arising out of the food rationing regulations relief in kind will be discontinued for the present and district welfare officers will issue cash relief for the purchase of extra nourishment

'OSTOPERATIVE ADMINISTRATION OF FLUIDS TO CHILDREN

G M Arnott
M.B Glasg, F R C S E
TE RESIDENT SURGICAL OFFICER,
ILDREN'S HOSPITAL, BIRMINGHAM

W F Young
M B Camb, D C H

During recent years many additions have been made our knowledge of the fluid requirements of adults in e postoperative period, and this paper records an tempt to apply this knowledge to children.

In temperate climates a healthy adult's fluid intake om all sources is usually 2000–3000 c cm daily, about alf this amount is lost in the perspiration and expired r and the other half in the urine The intake of a sick erson is often diminished, and although his kidneys may kcrete the waste products of the body satisfactorily in a naller volume of more concentrated urine, the losses by e skin and lungs are always maintained, they are icreased if sweating is profuse or if the respiration-rate raised As soon as the patient's fluid intake is estricted he is in danger of becoming dehydrated, and this happens his comfort will be impaired and his rogress retarded The prognosis after operation will be reatly improved if dehydration is relieved by satisfying is fluid requirements

Children who are suffering from acute abdominal diseases often become dehydrated They take less by nouth, they lose more by the skin and lungs, vomiting nay add to their distress and persistent vomiting may ead to a serious loss of salt as well as of water The ommonest causes of vomiting of this type in children re hypertrophic pyloric stenosis, paralytic ileus and ntussusception. In the last two, large volumes of the astro-intestinal juices may accumulate in the distended oils of bowel and so increase the degree of dehydration. reatment may also increase dehydration if the stomach s often washed out, or if suction drainage is instituted r an enterostomy performed Hæmorrhage into the bowel in intussusception may contribute to the dehydration, but it requires treatment by blood-transfusion if the loss of blood has been severe

Estimation and relief of dehydration—Coller and Maddock (1935) have stated that when an adult shows severe signs of dehydration he has lost fluid representing 6% of his body-weight Their signs included sunken eyes, a dry inelastic skin, dryness of the mouth and tongue, and the passing of a scanty, concentrated urine The red-cell count, hæmoglobin percentage and blood-urea were raised The water shortage of our patients was assessed on these criteria, and the salt deficiency on the history of vomiting, the diagnosis, and, when possible, the relationship of the plasma sodium and chloride to the hæmoconcentration. It was found that, in children, degrees of dehydration ranging from mild to moderate and severe were relieved by volumes of fluid representing 3–6% of their body-weight As the tissues absorbed the fluid the patients assumed a more normal appearance, the sunken features filled out, the skin regained its elasticity, the mucous membranes became moist, and larger volumes of less concentrated urine were passed. Lashmet and Newburgh (1932) have shown that the normal kidney can concentrate urine to a specific gravity of 1032, and that even with this concentration an adult must secrete 500 c cm each day to eliminate the waste products of the body. Accordingly, the restoration of normal volumes, coupled with a fall in the specific gravity of the urine, were accepted by us as proof that adequate amounts of fluid were being given Confirmation was obtained by observing the relief of hæmoconcentration and the fall in blood-ureas

Estimation of the normal daily requirement—At the beginning of treatment it is necessary not only to relieve the dehydration but also to give the patient sufficient fluid to cover his normal losses Because the basal metabolic rate (BMR), the blood-volume and the kidney function are related to the surface area rather than to the body-weight, the following formula was used to estimate the normal daily fluid requirement of children

Child's requirement = Adult's requirement — Surface area of adult/Surface area of child

The adult's requirement was taken to be 3000 c cm

Table I shows the surface area factors (surface area of adult — surface area of child) and fluid requirements for children of different ages of average weight and height In children under 6 years the BMR is high in relation to the surface area (Du Bois 1936), but we have neglected this factor and using the same calculation have found the allowances satisfactory for patients down to the age of 6 months The assessments are only approximate but with these volumes the kidneys can be relied on to make the necessary adjustments It will be seen (table I) that the required intakes are easily remembered as follows

750 c cm. at 1 year
1000 c cm at 3 years
1500 c cm at 8 years
2000 c.cm at 12 years

TABLE I—SURFACE AREA FACTORS (SAF) AND 24-HOURLY FLUID REQUIREMENTS FOR CHILDREN OF DIFFERENT AGES

Age (yr)	Height (in)	Weight (lb)	SA (sq m)	SAF (1 73/SA)	Fluid required 3000/SAF (c cm)
½	25½	16	0 34	5 08	600
1	29	21½	0 42	4 12	730
2	33	28	0 52	3 27	920
3	36	32	0 59	2 88	1040
4	40	38	0 68	2 55	1180
5	41	41	0 72	2 4	1250
6	44	44	0 76	2 28	1320
7	45	48	0 82	2 11	1420
8	47	52	0 88	1 97	1525
9	49	58	0 95	1 82	1650
10	51	63	1 01	1 71	1760
11	53	69	1 08	1 6	1890
12	55	77	1 17	1 48	2002
13	57	85	1 25	1 38	2170
14	59	95	1 34	1 28	2340

PRESENT INVESTIGATIONS

The *object of these investigations was: (1) to determine* whether the methods employed for assessing the fluid requirements formed a safe basis for treatment; and (2) to find which observations were most helpful for controlling the treatment The fluid intake and when possible the urinary output were measured for several 24-hour *periods after operation*

During the first day separate specimens of urine were collected and the volume and specific gravity of each were measured They were also tested for ketone bodies and chlorides Subsequently the 24 hourly output was examined. Samples of blood were taken from a finger prick. Whole heparinised blood was used for the hæmoglobin and urea estimations and plasma from heparinised blood for proteins, chloride and sodium, 1 c cm. was sufficient for duplicate analyses Hæmoglobin was determined by Evelyn's (1936) method, in which 100% = 15 6 g of Hb per 100 c cm of whole blood, urea was determined by Lee and Widdowson's (1937) method, and Evelyn's photoelectric colorimeter was used for both. Plasma chlorides were determined by Claudius's ultramicro method, and sodium by Kramer and Gittleman's method, both of which are described by Peters and Van Slyke (1932) The proteins were estimated by the micro-Kjeldahl method Normal ranges accepted for the blood chemistry were

Protein	6– 8 g	per 100 c cm of plasma
Urea	20– 40 mg	,, ,, ,, blood
Sodium	320–350 mg	,, ,, ,, plasma
Chlorides	340–380 mg	,, ,, ,, plasma

The *following* case-histories illustrate the calculation of the fluid requirement and its administration by various routes

ORAL ROUTE

Children who were not acutely ill were sometimes able to take the whole of the fluid required by mouth; 4–6 hours after the operation, sips of water (up to ½ oz) were offered at half-hourly intervals, the amount was then increased gradually, longer intervals were allowed, and fruit drinks were added It was difficult to give enough sugar to prevent ketosis, but a 10% solution of 'Dextri-Maltose' flavoured with fruit juice and containing about 60 g of carbohydrate per pint proved a palatable drink. It was much more effective than "hospital" lemonade, and barley sugar and boiled sweets were useful supplements The intake, output, and other findings in the following six cases are analysed in table II

Case 1—Girl of 4 years Drainage of appendix abscess Had been ill for 72 hours before operation, but had only vomited once Slightly dehydrated, but general condition good The estimated normal requirement for 24 hours was 1180 c cm (table I) and with such an intake the expected urinary output was 500–600 c cm During the first 24 hours the oral intake was sufficient, but since it did not allow for any dehydration the total output of urine was rather low Its specific gravity, however, fell from 1032 to 1011 and the expected volume was secreted on subsequent days Blood for analysis was taken before treatment began, and the results confirmed the fact that dehydration was only slight, there was a low blood-urea with no evidence of hæmoconcentration or salt deficiency

RECTAL AND ORAL ROUTES

It was usually impossible to give an ill child the whole of the required volume by mouth for the first few days after operation, in these circumstances the balance of fluid was given, preferably by rectum A continuous rectal drip of tap water, or ⅕ normal saline was well retained by children over the age of 3 years, but sugar solutions given by rectum were not Since prolonged sugar starvation is badly tolerated by children, rectal fluids were only used to supplement oral feeding

CASE 2—Girl of 8 years Drainage of appendix abscess Had had abdominal symptoms for 15 days, but had vomited only on the first day Appeared to be only slightly dehydrated but very toxic The estimated normal requirement was 1525 c cm for 24 hours and with such an intake the expected urinary output was 700–800 c cm During the first 24 hours a rectal drip of ⅕ normal saline was given at the rate of 1600 c cm in 24 hours and about 345 c cm was taken by mouth, the total normal requirement was therefore exceeded by a small allowance for dehydration This extra allowance was apparently adequate since the urine output was 800 c cm with a fall in specific gravity to 1020 There was rapid clinical improvement and subsequent progress was uninterrupted, but it was not until the fifth day that the whole fluid requirement was accepted by mouth The serum chemistry was normal before treatment and the changes induced by treatment were slight and of the expected form

INTRAVENOUS ROUTE

When feeding by mouth is contra-indicated—as it is in general peritonitis, paralytic ileus and after operations on the gut—fluid has to be given intravenously, and the correct type of solution and its rate of administration are very important The infusion of large volumes of 5% glucose in normal saline has had unwarranted popularity, and we were able to observe the ill effects of such treatment in a child who had been kept on it for several days

CASE 3—Girl of 6 years with pneumococcal peritonitis Had been ill for 48 hours before admission The estimated normal daily requirement was 1320 c cm with an expected urinary output of 600–700 c cm

Data are incomplete (table II), but the child was receiving large amounts of sodium chloride in a rather low fluid intake over 4 days, the amounts being first day 8 g, second day 8 g, third day 11 1 g, fourth day 8 2 g, fifth day 1 66 g The retention of salt, seen in the high level of the plasma sodium and chloride, resulted in anuria on the fourth day with slight œdema of the hands and feet When 5% glucose was given there was a diuresis and the œdema disappeared

The effects of administering massive doses of sodium chloride are often seen in hospital practice, and the dangers of such therapy have been stressed by Coller, Dick, and Maddock (1936), Jones and Morgan (1938), and Aldridge (1941) and other workers Falconer and Lyall (1937) showed that an adult's minimum requirement of sodium chloride was 1–2 g per day and that the excess in a normal diet, which may amount to 10–15 g, was excreted by the kidney In the uncomplicated postoperative treatment of adults Jones and Morgan found that the daily administration of 5 g of sodium chloride was sufficient for maintenance, and that this amount in the 3000 c cm of fluid usually required made a ⅕ normal solution These workers, therefore, recommended the use of a 4 1% glucose in ⅕ normal saline solution for intravenous therapy This fluid is isotonic, the sugar provides calories and combats any ketosis We have used 4 1% glucose in ⅕ normal saline solution to cover the normal daily requirement and any fluid shortage due to starvation Normal saline was reserved for the relief of dehydration caused by vomiting and to replace, in approximately equal volume, any postoperative loss of intestinal juices by emesis or drainage At the beginning of treatment the volume for the relief of dehydration was added to the estimated normal requirement for 24 hours The hourly rate of flow was then calculated and the fluid given by continuous intravenous drip. After the dehydration was relieved the rate of flow was readjusted, and, as the oral intake was gradually increased, the infusion was proportionately withdrawn

The following details show the calculations and allowances made for 4 children who required intravenous therapy When their requirements were estimated they were taken to be of average weight for their age They responded well to treatment and made good recoveries

CASE 4—Boy of 8½ years Acute gangrenous appendicitis with localised peritonitis, appendicectomy with drainage Had been ill and vomiting repeatedly for 48 hours before operation Appeared to be very toxic and the dehydration was estimated as 3% of his body weight It was calculated that this required 700 c cm for its relief, and, since the normal requirement for 24 hours for a child of this age is 1580 c cm the volume to be administered was 2280 c cm and the urinary output to be expected was 700–800 c cm Because of the history of vomiting 710 c cm of normal saline was given to relieve the dehydration and the infusion was continued with 4 1% glucose in ⅕ normal saline at a rate of flow aiming at 2200 c cm in 24 hours After 12 hours' treatment there was definite clinical improvement but since the only specimen of urine had a specific gravity of 1029 the infusion was continued at the same rate After 24 hours' treatment there was continued improvement and the patient had taken small amount of fluid by mouth The specific gravity of the urine had fallen to 1022 and the volume for the whole period was 750 c cm During the second 24 hours the total intake was 2060 c cm while the urine output was 1970 c cm The diuresis showed that since operation the intake had been unnecessarily large, this was partly because an unexpectedly high oral intake had augmented the amount given by infusion The 700 c cm of normal saline given at the outset may have delayed the diuresis by retaining water The drop in the plasma proteins and the increase in the amount of sodium in the plasma suggest that this was so The patient's progress was unaffected, and from the third day onwards, when the estimated daily requirement was given, he secreted the expected volume of urine

The day-to-day variations in the blood analyses in this case show the following points

1 Before treatment the only really abnormal findings were a raised blood-urea (which dropped with the relief of dehydration in the first 24 hours) and the low plasma chlorides, caused by the previous vomiting The chlorides were raised by the administration of normal saline and the ensuing readjustment of the patient's acid base balance

2 There was a fall in the plasma proteins after 24 hours' treatment and at this stage they were a fair index of the plasma volume The fall on the eighth day was probably due to a low protein intake during a period of severe infection

3 Serial determinations of the hæmoglobin were not an index of hæmodilution in this patient Between the first and second days there was a fall in the hæmoglobin percentage, while the level of the proteins in the plasma had risen Hæmolysis, shown by the presence of hæmobilirubin in the plasma and a very high concentration of urobilinogen in the urine, had caused the fall This type of anæmia may be associated with any severe infection

4 Normal saline, 700 c cm, was administered at the outset and as a result the sodium in the plasma was high but the plasma chlorides were still rather low There must have been therefore considerable chloride deficiency before treatment, caused by the loss of hydrochloric acid in the vomitus

CASE 5—Boy of 2 years Drainage of appendix abscess Had been ill for 4 days, refused fluids by mouth, but had vomited only once His dehydration, mainly caused by starvation, was estimated as 500 c cm (4–5% of his body weight) The normal daily requirement was 920 c cm with an expected urinary output of 400–500 c cm In the absence of repeated vomiting only 75 c cm of normal saline was given at the outset and the drip was continued with 4 1% glucose in ⅕ normal saline at a rate of 50–55 c cm per hour in the first 24

TABLE II—ANALYSIS OF FINDINGS

Days after opn	Intake (c cm)				Output		Urine analysis			Blood analysis				
	Oral	Rectal	Intravenous	Total	Bowel actions	Urine (c cm)	SG	Ketones	Chlorides	Hb (%)	Protein %	Urea	Na	Chlorides
												(mg per 100 c cm)		
Case 1											*7 06*	*23*	*327*	*372*
1	945			945		300	1032	+ + +						
2	910			910		600	1009	+ +						
3	900			900	1	565	1009	+						
4	1180			1180		645	1010	0						
5	1160			1160	1	605	1013							
Case 2										*92*	*6 64*	*24*	*318*	*331*
1	345	1600		1945		800	1028 1026 1020	+	+ +	87	6 37			
2	560	1300		1860	1	860	1007	+	+ +					
3	660	1000		1660		720	1010	+	+ +					
4	1060	500		1560	1	600	1012	0	+ +					
5	1410			1410	1	750	1010	0	+ +					
6	1500			1500	1									
8										103	6 67		343	348
Case 3														
1	Sips		890 A	890 +		?								
2	Sips		890 A	890 +		?								
3	Sips		1235 A	1235 +		?					4 9	37	372	389
4	Sips		910 B	910 +		Anuria					5 31		390	432
5	Sips		185 B *605 C*	790 +	1	285					5 38		400	390
6	Sips		810 C	810 +	2	630 +					5 63		339	
7	570		675 C	1245		450 +								
Case 4										*105*	*5 8*	*44 5*	*354*	*322*
1	238 +		710 A 1570 D	2518		750	1029 1022	+ +	+	94	4 9	23	381	322
2	465		1595 D	2060		1970	1010		+ +	85	5 6		343	322
3	675		765 D	1440		865	1010		+ +	86	6 08		312	345
4	1164		0	1164	1	760	1012		+ +	85	5 95		292	311
5	1470		0	1470	2	850	1010		+ +					
8										84	5 2		300	344
Case 5										*89*	*6*	*65*	*323*	*321*
1	20		75 A 1245 D	1340		292 +		+ +	+			32 5	318	343
2	366		487 D	853		348 +			+	73	5 25	19	323	312
3	631 +			631 +	1	300 +			+	72	5 1			
4					1					76	5 54		320	331
Case 6														
1	0		300 A 610 D	910		+ +								
2	Sips		690 D	690 +		+ + +					5 32	23	320	312
3	250		400 D	650	1	+ + +								
4	480		100 D	580	2	+ + +				53	5 32	35	318	312
5	720		200 E	920	1	+ + +				88	5 43	27	315	321
*Case 7**										*112*	*6 08*	*105*	*294*	*330*
1			800 A 550 D	1350		+				96	5 32		388	307
2			100 A 1260 D	1360		+ +					5 67	34		288
3			100 A 820 D	920	1	+ + +					4 95	26		302
4	100		150 A 750 D	1000		+ + +				88	4 77	39		313
5	400		500 D	900	2	+ + +					5	32		
6	850			850		+ + +								

* This patient lost much fluid by vomiting on the first day, and by duodenal drainage 60 c cm on the first day 100 c cm on the second day and 150 c cm on the third day. The figures *italicised* are preoperative

A = normal saline, B = 5 % glucose in normal saline, C = 5 % glucose, D = 4 1 % glucose in ⅕ normal saline E = blood

hours. With the relief of dehydration and the rapid disappearance of toxæmia, the child took fluids readily by mouth, and on the second day the normal requirement was divided between the oral and intravenous routes, the infusion being withdrawn at the end of 48 hours. Some of the urine was lost but the measured output was approaching the expected volume so that the amount of fluid administered must have been adequate for the patient's requirements.

A comparison of the blood analyses in this case before and after treatment shows the following points:

1. The blood-urea, the percentage hæmoglobin and the plasma proteins were raised when the patient was dehydrated. The plasma proteins and the hæmoglobin changed together, and either could have been used as an index of hæmodilution.

2. There was little day to day variation of the sodium and the chloride in the plasma.

CASE 6.—Boy of 7 months. Gangrenous compound intussusception; removal of gangrenous portion of gut and anastomosis without drainage. Had vomited repeatedly and had attacks of pain for 48 hours before admission. The normal daily requirement was 700 c cm and the volume for the relief of the dehydration was estimated as 300 c cm (4% of the body weight). Because of the history of vomiting the volume for the relief of dehydration was given as normal saline at the outset. It was followed by 4 1% glucose in ⅕ normal saline, and the daily allowances were carefully measured. The urine was not collected but it was passed frequently after the dehydration was relieved, and the bowel was opened regularly from the third day. He had a smooth convalescence and the blood chemistry showed little change throughout treatment. Clinical improvement was uninterrupted as oral feeding gradually replaced the infusion, and the anæmia was relieved by a blood transfusion on the fifth day.

Cases 4, 5 and 6 show the importance of obtaining an exact history of vomiting before estimating the salt requirements for the relief of dehydration.

Postoperative treatment of patients suffering repeated losses of gastro-intestinal juices is a complicated procedure, but with careful therapy it is possible to maintain their fluid balance over a long period. The loss by vomiting, duodenal drainage or enterostomy is replaced by an approximately equal volume of normal saline. It is clear that more hydrochloric acid than sodium chloride is lost in duodenal drainage for the plasma chloride is often low while the sodium is normal. Jones and Morgan (1938) maintain that a moderate hypochloræmia is unimportant in the absence of dehydration, and this has been our experience If the plasma chloride alone had been taken as an indication for giving more normal saline, an overdose of sodium with consequent water retention would have been risked

The next case illustrated the management of a patient suffering from paralytic ileus treated by duodenal suction and rest to the bowel

CASE 7 —Girl of 2¾ years Gangrenous appendicitis with general peritonitis and paralytic ileus, appendicectomy with drainage Had been ill for 80 hours before operation and had *vomited repeatedly, the later vomits being fæculent* Her dehydration was severe and estimated at 800 c cm (6% of her body-weight), and the normal daily requirement was 1000 c cm Because of the history of vomiting the infusion was begun with 800 c cm normal saline The extra allowance for dehydration was given over the first 48 hours, the drip being run at about 1350 c cm per day Dehydration was relieved within 24 hours, but although the child was not continent it is known that urine was passed only twice during this time Thereafter the bed was much more often wet During the first 4 days extra volumes of normal saline were given to compensate for the loss of salt in the duodenal drainage The serial blood analyses show that the severe dehydration was associated with a very high blood urea and with hæmoconcentration which increased the significance of the low sodium and chloride in the plasma After 800 c cm of normal saline on the first day the plasma sodium was high but the chlorides were still low They dropped to a lower level without ill effect while the duodenal suction was being used and despite the extra salt allowances did not begin to rise until the ileus was relieved

DISCUSSION

The postoperative treatment of these 6 children, whose fluid requirements were assessed on basic physiological principles, illustrates the method used in a larger series whose ages ranged from 7 months to 13 years Most patients suffering from appendix abscess recover with the usual surgical treatment, which is often little concerned with the details of fluid balance It may therefore be argued that it is better to leave well alone, it is certainly better to leave an ill child to his own devices in taking fluids than to drown him in large volumes of saline his tissues are in no way helped to overcome infection by substituting œdema for dehydration The aim of the treatment we have described, however, is to *restore the normal fluid intake and output* Our patients have benefited from the early relief of their dehydration, and their toxæmia became much less in spite of persisting infection It seems rational to suppose that the excretion of toxins depends on an adequate urinary output The patients who would get better in any case are helped to a quicker recovery, while for “ the poor surgical risk ” the chances of survival are enhanced by restoring and maintaining body fluids

The administration and charting of fluids presents little difficulty after some practice in the routine The *interval before the amount needed can be given by mouth* varies with each patient, milk and low-residue solids should be gradually added to the diet after the rectal and intravenous fluids have been withdrawn It is necessary to control the rate of administration carefully when using the intravenous route No ill effects have been observed from giving the volumes recommended here, although these are considerably larger than those used in the past at this hospital The faster rate of flow required during the relief of dehydration was well tolerated, but convention suggests that too much fluid should not be given to a sick patient, we do not now give intravenously in the first 24 hours, a volume representing more than 4% of the body-weight plus the estimated normal daily requirement. If necessary the balance is made up on the following day, the deficiency being reflected only in a slower return to the normal urinary output If the specific gravity of the urine falls well below 1030 it can be assumed that sufficient fluid is being given No fixed *rule can be made for assessing the salt requirement* Each case must be judged on its own merits but, if the amount to be given is regulated by the methods we have described any gross error will be avoided Of 7 cases of paralytic ileus treated in this way 4 survived One was admitted with a gangrenous ileocæcal intussusception and operation included removal of the gangrenous portion of colon, anastomosis and ileostomy Because of persistent vomiting duodenal drainage was used, and the child was therefore losing gastro-intestinal secretions by two routes *Intravenous fluids, however, relieved* the dehydration and after the bowel had moved his convalescence was uneventful One of the 3 fatal cases died 6 hours after operation the other 2 were kept in fluid balance but died with the ileus unrelieved

The patient’s progress is always the best indication of the effects of treatment, and since giving these volumes and solutions no child has become dehydrated during the postoperative period Accurate observations on the *urine output in the younger patients are often impossible* nor are they necessary A record of the number of *times the bed is wet and a daily specimen for examination* usually provide sufficient information

The interpretation of the blood chemistry needs great care, particularly that of single samples We have found that some sick children have comparatively low hæmoglobin levels and that the concentration of protein in the plasma may also be low even when they are dehydrated Neither can therefore be used as a guide to the amount of fluid required to relieve dehydration During the postoperative period hæmolysis may cause a sudden drop in the percentage of hæmoglobin, and the plasma *proteins tend to fall as a result of infection and starvation* When fluids are given intravenously the rate of infusion may affect the findings, and the blood should not be taken for analysis if the drip has been running quickly during the preceding hour If these complicating factors have been excluded, however, serial estimations may be very useful as an indication of hæmodilution, for it has been shown that water retention follows the administration of excess of salt A fall in the plasma proteins below the œdema level (5 g per 100 c cm) must be taken as a warning to avoid further dosage while maintaining a sufficient water intake for an adequate urinary output If the urine remains scanty a 20% glucose solution is a valuable diuretic It has already been pointed out that low plasma chlorides are to be expected when there have been persistent losses of hydrochloric acid from the stomach, and that they alone should not be used as a guide to the amount of saline required

Further work is needed before assessing the value of plasma transfusions for maintaining the level of the proteins in the plasma of children who are ill for a long time, *but our findings suggest that* they might be useful It must be remembered that the salt content of plasma is approximately equivalent to that of normal saline

This series of cases shows the allowances made for children with acute abdominal diseases, but the principles are applicable to all postoperative treatment

SUMMARY

Children’s fluid requirements vary with their surface area rather than with any other measurement They have been calculated on this basis and tabulated

Methods are given for assessing the postoperative fluid requirements of children

A series of cases was treated and the details of 6 are described *Fluid was given by mouth,* by rectum or by vein as circumstances demanded

We wish to thank the honorary staff of the Children’s Hospital, Birmingham, for permission to treat their cases, and for the facilities to carry out these investigations, and Prof L G Parsons and Dr R A McCance for their advice Most of the chemical estimations were carried out by Miss E Finch, M Sc Expenses of the work were partly covered by a grant made to the hospital by the Medical Research Council, one of us (W F Y) is also indebted to the council for a personal grant

REFERENCES

Aldridge, A G V (1941) *Arch Dis Childh* 16 182
Coller, F A and Maddock, W G (1935) *Ann Surg* 102, 947
— Dick V S and Maddock, W G (1936) *J Amer med Ass* 107, 1522
Du Bois E F (1936) Basal Metabolism in Health and Disease, London
Evelyn K A (1936) *J biol Chem* 115 63
Falconer M A and Lyall A (1937) *Brit med J* ii 1116
Jones F A and Morgan C N (1938) *St Bart's Hosp Rep* 71
(1939) *Lancet* ii 611
Lashmet F H and Newburgh L H (1932) *J clin Invest* 11 100
Lee M H and Widdowson E M (1937) *Biochem J* 31 2035
Peters J P and Van Slyke D D (1932) Quantitative Clinical Chemistry, Baltimore, vol ii, 737 and 839

SULPHONAMIDES BY MOUTH IN THE TREATMENT OF IMPETIGO

BERNARD E SCHLESINGER
M.D CAMB , F R C P
LIEUT -COLONEL R.A.M C
PHYSICIAN TO OUTPATIENTS
HOSPITAL FOR SICK CHILDREN,
GREAT ORMOND STREET

N H MARTIN
B M OXFD, M.R C P , F I C
MAJOR R A.M C ,
ASSISTANT PATHOLOGIST
TO THE
MIDDLESEX HOSPITAL

THIS paper forms the preliminary report of an investigation on the treatment of impetigo The oral administration in adequate dosage of sulphonamides has been accompanied by results sufficiently satisfactory to justify publication at this stage

The streptococcus is said to be the organism primarily associated with impetigo contagiosa of Tilbury Fox (Sabouraud 1928, Macleod and Muende 1940) In the lesions a pathogenic staphylococcus is often associated with the streptococcus At times the staphylococcus is the only organism found In such instances the more robust staphylococcus may have persisted and multiplied at the expense of the streptococcus which, overrun, has died out We ourselves believe that there is a bacteriologically distinct entity—a staphylococcal impetigo—having close clinical resemblance to the streptococcal impetigo and being distinct from Bockhart's impetigo The impetigo of Bockhart is essentially a pustular folliculitis and as such has a morbid anatomical relationship to sycosis Bockhart's folliculitis might be a better term for this condition

It is rational to expect that substances having an established streptocidal or streptostatic effect should benefit any cases of streptococcal impetigo, and that those cases in which staphylococci are the primary infective agent, or in which staphylococci have become the principal infective agent, should benefit from a staphylocidal or staphylostatic substance Our therapeutic investigations started from this primary contention They were encouraged by the startlingly successful result obtained when we treated our first case, an intractable one, with sulphathiazole Individual series were treated by mouth, using sulphanilamide, sulphapyridine, sulphathiazole or sulphadiazine In addition a short series was treated with sulphanilamide applied locally and another with sulphapyridine applied locally as a powder or simple paste For control a series was treated with gentian violet

MATERIAL AND METHOD

Bacteriological examination of the lesions was carried out on admission Sulphanilamide was used for a relatively high proportion of those patients from whose lesions streptococci were isolated Sulphathiazole and sulphadiazine were reserved for the worse cases—those which had shown no improvement, or had retrogressed, under alternative treatments either outside or in this hospital These forms of treatment included the use of unguentum hydrargyri ammoniati, gentian violet, brilliant green, ichthyol and calamine, sulphanilamide and sulphapyridine applied locally and sulphanilamide given by mouth Before any form of treatment was started 3 days were allowed to elapse to satisfy ourselves that the condition was not improving and to take careful cultures from the lesions

The average duration of the disease before using sulphathiazole was 30 days, the minimum duration 3 and the maximum 101 days Few patients were in our hands before the 4th day , the majority had had some form of treatment before reaching us All our patients except one were males from 18 to 45 years of age The majority were between 20 and 35 The one exception was a female child of 2 years

The effectiveness of all forms of local treatment in severe cases of impetigo must in a measure depend on the diligence and intelligence of those who apply them, and will therefore vary in different hands Administration by mouth is free from this objection, though it may be argued that differences of absorption give opportunities for variation We have attempted to meet this by estimating the blood level of free sulphonamide reached

At first 18 g of the sulphonamide was given in 4 days, but though we had some successes certain patients required further treatment The dosage was increased therefore to 24 g given in either a 5-day course of 7, 6, 6, 3 and 2 g , or a 6-day course of 7 6 3, 3, 3 and 2 g. An initial dose of 2 g was given and 4-hourly administration continued for the next 72 hours followed by 8-hourly administration to the end of the course Occasionally a heavier dosage was required and it was important to maintain a steady concentration of the drug through the 24 hours On the 24 g course the concentration of free sulphathiazole or free sulphadiazine in the blood of most patients was above 5 mg per 100 ml of blood We have had cures in patients whose blood concentration never rose much above 4 mg per 100 ml Serum was collected from the lesions of 4 patients under sulphathiazole Qualitative tests demonstrated the presence of a sulphonamide but the amounts were too small for quantitative analysis

During the 5 days of treatment all patients were kept in bed Patients on sulphonamides by mouth received no local treatment

RESULTS

Tolerance and reactions —With the dosages given the sulphathiazole was well tolerated though most patients felt some depression Had the drug been available in quantity, higher dosage could have been tolerated by most, in some instances with advantage In one patient only there was a sharp reaction after 60 hours of treatment He developed a widespread rash with a conjunctivitis, so severe that at 72 hours the sulphathiazole was stopped, whereupon he recovered completely In no case did a serious neutropenia develop and in no case did we observe macroscopic hæmaturia

With sulphapyridine the sense of depression was more severe In some instances persistent nausea and vomiting in spite of the use of different vehicles for the drug, forced us to stop treatment since we did not feel that the nature of the disease justified us in pushing the course to its conclusion Here again no dangerous neutropenia developed during treatment and no cases of macroscopic hæmaturia were observed

Apart from the depression common to all, there were no other incidents in the three series treated with sulphanilamide, sulphapyridine or sulphathiazole, but the patients on these drugs all agreed that in the first 48–72 hours they did not feel capable of heavy mental or physical strain In striking contradistinction the short series on sulphadiazine had no feeling of depression and though they were kept in bed were confident that they were fit to be up and about their work None of this series developed neutropenia , one had transient hæmaturia which cleared without any demonstrable after-effect

TABLE I—ANALYSIS OF TREATMENT IN IMPETIGO CASES

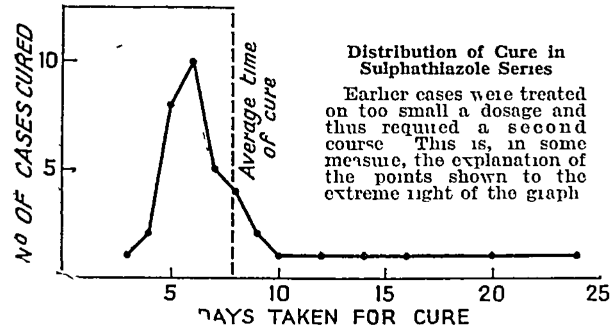
Treatment	Cases treated	Cured	Av time of cure (days)	Lesions containing β-hæmolytic streptococci	
				Cases	Cured
Sulphanilamide by mouth	50	26 (52 %)	8	21	16 (76 %)
Sulphapyridine by mouth	35	21 (60 %)	7	15	12 (80 %)
Sulphathiazole by mouth	46	38(82 5 %)	8*	6	5(83 5 %)
Sulphadiazine by mouth	10	8 (80 %)	7	4	4 (100 %)
Gentian violet, local †	30	15 (50 %)	11	20	12 (60 %)
Sulphanilamide local	8	4 (50 %)	7	3	3 (100 %)
Sulphapyridine, local	10	5 (50 %)	6–7	5	3 (60 %)

* See graph of rate of cure of cases on sulphathiazole
† All relatively mild cases

During a successful course the lesions dried up rapidly in 36–72 hours In the next 24–48 hours the crusts fell away leaving a flushed surface This flush disappeared gradually and the skin returned to normal Occasionally residual crusts persisted but these fell off without further treatment The patients did not shave until the 4th or 5th day of their course After each shave a simple antiseptic shaving lotion was applied all over the shaving area The pillow-slips were changed each day No other ancillary treatment was used When the course was completed the patients were kept under observation for a further 3 days

The results are analysed in table I It will be seen that sulphathiazole stands out as the drug of choice

Patients from whose lesions streptococci were isolated responded almost equally well to sulphanilamide, sulphapyridine and sulphathiazole The graph of the cure-time ratio of sulphathiazole shows that the average cure-rate of this drug is heavily loaded by a few patients who needed extended courses treatment Some of these were patients early in the series when we had not adjusted our total dosage to 24 g The series on sulphadiazine is too short for proper comparison, but the preliminary results from it are as encouraging as those with sulphathiazole Finally, though gentian violet at times produced satisfactory results in localised lesions it does not compare with sulphathiazole or the other sulphonamides when the lesions are spreading rapidly or already widespread At the bottom of table I are two short series treated by local application with sulphanilamide and sulphapyridine We did not use sulphathiazole locally, wishing to conserve our stocks for treatment by mouth With local applications we did at times get very good results, but, as we have said before, we feel that the efficacy of local treatments must always depend on the skill of persons applying them



Distribution of Cure in Sulphathiazole Series

Earlier cases were treated on too small a dosage and thus required a second course This is, in some measure, the explanation of the points shown to the extreme right of the graph

Causes of failure—Our failures appeared to be the result of certain well-defined causes The first was persistent auto-reinfection, in these cases we could produce temporary cure, but one small area would persist in breaking down when administration of sulphonamides was stopped These areas were most often on the upper lip, at the angles of the nostrils or near the ear In a number of such cases swabbing of the nose or examination of the ear revealed a primary infection which we were often able to clear up by diligent local treatment Secondly, there were the chronic impetiginised fissures occurring behind the ears and at the corner of the mouth We had considerable success in treating these with local applications In particular, gauze soaked in a 25% solution of 'Sulphonamide E O S' packed behind the ear and renewed twice daily was successful in retro-aural fissures Thirdly, there was a group with associated mild sycosis—probably cases of Bockhart's folliculitis with a superimposed sycotic element sent to us labelled impetigo These were all difficult to treat though many showed some improvement

Finally, we met 2 cases in which our in-vitro tests led us to believe we were dealing with organisms truly resistant to sulphonamides One was a hæmolytic streptococcus which would grow on sulphathiazole agar and showed no inhibition by Fleming's ditch-plate technique, the lesions healed slowly under gentian violet The other was a coagulase-positive *Staphylococcus aureus* which grew not only on sulphathiazole agar but on the gentian violet plates which we used for the isolation of streptococci This patient kept having recurrences under all forms of treatment He was not a carrier of pathogenic staphylococci We do not think these cases common and believe the first three causes of failure are the most usual

Fomites—From cultures taken from the collars of 10 greatcoats selected at random from one impetigo ward we grew a coagulase-positive *Staph aureus* in 5 cases and β-hæmolytic streptococci in 4 We had 2 clear-cut return cases with outbreak on the neck where the greatcoat collars could be incriminated

Other skin conditions—A few cases of infected scabies, furunculosis and sycosis were also treated with sulphonamides by mouth The results are shown in table II, which needs no amplification

DISCUSSION

Cruickshank (1941), in an analysis of 23 cases of impetigo contagiosa, cultured a β-hæmolytic streptococcus from 15 and a *Staph aureus* from 18 out of the 23 cases He said that in all cases where a hæmolytic streptococcus could not be recovered a staphylococcus was isolated Thus from 43% he recovered both streptococci and staphylococci, in 35% he recovered a staphylococcus only and in 22% he recovered streptococcus only In cultures of lesions from 190 consecutive patients we recovered both organisms in 42%, *Staph aureus* in 47%, and hæmolytic streptococci in 11% The following factors probably contributed to the high incidence of staphylococci in our series few patients reached us before the 4th day of the disease, most much later, a number had been treated before reaching us with antiseptics calculated to kill the streptococci, some sent as impetigo were undoubtedly examples of Bockhart's folliculitis, as we would prefer to call it Our technique for the isolation of the streptococci was similar to that used by Francis, the lesion being sampled with a platinum loop or wire with aseptic precautions

Though these investigations suggest that adequate oral administration of all sulphonamides have their place in treatment of impetigo they demonstrate that sulphathiazole is superior to both sulphanilamide and sulphapyridine In selected cases all three gave excellent results Sulphadiazine seems to be as effective as sulphathiazole, though the series treated with it was small It produces less constitutional upset When the results of the cases from which streptococci were isolated are analysed, the margin of sulphathiazole's superiority over sulphanilamide and sulphapyridine is much narrower, this is not surprising from experience with these drugs in other fields

TABLE II—MISCELLANEOUS SKIN INFECTIONS TREATED WITH SULPHONAMIDES BY MOUTH

Condition	Cases treated	Organism isolated	Treatment	(a) No cured, (b) Av time of cure (days)
Scabies secondary infected by scratching *	6	β hæmolytic streptococci	Sulphanilamide 24 g	(a) 6 (b) 6
	1	*Staph aureus* coag positive	Sulphapyridine 24 g	Healed after 10 days with help of local application of sulphapyridine powder
	2†	,,	Sulphathiazole 18 g	(a) 2 (a) 1, (b) ɔ
Furunculosis	3	,,	Sulphathiazole	(a) 1, (b) 5
	2	,,	Sulphapyridine	0
Sycosis	1	,, ‡	Sulphanilamide	1 improved
	5	*Staph aureus* coag positive	Sulphapyridine	(a) 6 others improved
	9	,, §	Sulphathiazole	(a) 2

* In 3 cases β hæmolytic streptococci were isolated from finger nails † Folliculitis ‡ Occasional β hæm strep § Occasional β hæm strep in 1 case

A certain number of reports on the treatment of impetigo with the sulphonamides have already appeared, Thus, Zederbauer (1939) claimed success with 'Uleron' in chronic recurrent cases and Erskine (1941) mentions oral administration of sulphonamides in small doses Many writers have made claims for the sulphonamides applied locally Among the most recent, Steigman (1942) appears to have had convincing results in children using sulphathiazole ointment, though one wishes he had used sulphanilamide ointment on some of his controls for comparison The work of Carslaw and Swenarton (1941) is not clear cut, in that they use sulphanilamide with brilliant green, so that it is difficult to decide to what extent their cure was hastened by either one of the drugs Probably time will show that the most effective and rapid method of treating impetigo is the combination of adequate oral administration with local application of a sulphanilamide, preferably sulphathiazole or sulphadiazine We have combined sulphanilamide with sulphathiazole in 2 cases in attempts at economy, these were both cured in 8 days but are not included in this series, to avoid confusion

SUMMARY

Administration of the sulphonamides in adequate dosage by mouth is of value in the treatment of impetigo

Sulphathiazole and sulphadiazine are the drugs of choice, but where streptococci are the predominating organisms in the lesion sulphanilamide or sulphapyridine are almost as satisfactory, provided adequate concentrations are maintained

Causes of failure were (1) auto-reinfection from nose or ear; (2) chronic impetiginised fissures behind the ears or at the corners of the mouth, (3) association with a sycosis, these cases probably being examples of Bockhart's folliculitis; (4) sulphonamide-resistant organisms The first three causes are the most usual

Our thanks are due to Major-General L T Poole and Brigadier E C Beddows, through whose kindness so much clinical material was directed to us We have to thank Colonel Rees for permission to publish this paper

REFERENCES

Carslaw R W and Swenarton J A (1941) *Brit med J* ii, 225
Cruickshank R. (1941) *Lancet*, ii 275
Erskine D (1941) *Guy's Hosp Gaz* 55, 324
Francis A E (1941) *Lancet* ii, 159
Macleod, J M H and Muende, I Practical Handbook of the Pathology of the Skin London (1940)
Sabouraud, R (1928) Quoted in A System of Bacteriology, London, vol. ii p 77
Seligman A. J (1942) *Brit med J* i 12
Zederbauer G (1939) Quoted in British Encyclopædia of Medical Practice, Surveys and Abstracts London, p 381

ANTIGENIC PROPERTIES OF *H PERTUSSIS* IN RELATION TO ACTIVE IMMUNISATION

D G EVANS, PH D MANC

(*National Institute for Medical Research*)

WITHIN the last few years the value of *Hæmophilus pertussis* vaccines for active immunisation against whooping-cough has been extensively investigated clinically The results obtained by a number of workers, summarised by Maclean (1940), show that although the immunity produced is substantial it is not quite of the solid type known to occur after some other prophylactics, for instance those for diphtheria It is generally believed that the protection which pertussis vaccines confer is due to specific antibacterial substances evoked in the inoculated child The bacterial antigen involved is heat-stable and probably closely related to the antigenically active fraction extracted from *H pertussis* by Cruickshank and Freeman (1937) But *H pertussis* also elaborates a toxin which is lethal for rabbits, guinea-pigs and mice when injected intravenously, dermonecrotic in small doses, extremely heat-labile, detoxified by formaldehyde and antigenically active This toxin is extracted from the bacillus by disrupting the organism by physical methods (Bordet and Gengou 1909, Teissier et al 1929, Miller 1934, Dennitz et al 1936 Evans and Maitland 1937, Evans 1940, Strean and Grant 1940, Flosdorf and Kimball 1940) It is not precisely known what part pertussis toxin plays in the pathogenesis of whooping cough, but it seems reasonable to believe that resistance to a toxin so potent which is also antigenic might have some importance in immunity Any investigation of new types of vaccine for prophylaxis, with the object of obtaining better protection, should therefore take into consideration the possible value of producing immunity to this toxic element

There is no evidence to show whether the pertussis vaccines which are now used in the prophylaxis of whooping-cough are capable of stimulating the production of antitoxin The vaccines are made from whole bacilli and toxin present originally has had its lethal and necrotising properties destroyed by the treatment to which the vaccines have been subjected during their preparation, but whether the antigenic property of the toxin has been retained, and if so to what extent, is not known The work here described was carried out because it was thought desirable, before attempting to investigate the value of toxin as an immunising agent in whooping-cough, to study the antigenic quality of various preparations of *H pertussis* as regards their ability to stimulate the production of (*a*) antitoxin and (*b*) antibacterial antibody

EXPERIMENTAL PROCEDURES

The strain of *H pertussis* used throughout this investigation had been preserved in the dry state in vacuo since its isolation and was in the phase 1 and fully toxigenic condition All preparations were made from bacilli grown on Bordet-Gengou medium for 48 hours

Pertussis preparations—(*a*) A toxic extract detoxified by formaldehyde The toxic extract was prepared by the method described by Evans and Maitland (1937), in which the organisms were first killed by alternate freezing and thawing, afterwards dried from the frozen state and then ground in an agate mortar for 30 min Saline was added to the dry, ground bacilli in the proportion of 1 c cm to 5 mg, and when a uniform emulsion had been obtained this was centrifuged at high speed, giving a slightly opalescent supernatant fluid The toxic potency of the supernatant fluid was determined by intradermal titration in the rabbit The average minimal reacting dose was 0 2 c cm of a 1·1000 dilution, which was equivalent to $0\ 3 \times 10^{-3}$ mg of dry extract The extract was detoxified by adding formaldehyde to give a final concentration of 0 08%* and incubating at 37° C for two weeks, when 0 2 c cm of the undiluted extract (1000 m r d.), injected into the skin of a rabbit, failed to give a reaction

(*b*) A toxic extract detoxified by heat The toxic extract was prepared in the same way as (*a*) but was heated at 56° C for 30 min This treatment, as shown by the intradermal test, rendered it non-toxic

(*c*) A suspension of organisms killed by formaldehyde A suspension of bacilli was made in saline so that 1 c cm contained 5 mg of bacilli as determined by the dry weight This concentration was used so that the preparation would be comparable, in so far as toxin was concerned, with preparations (*a*) and (*b*), in which 1 c cm of extract was obtained from 5 mg of dry bacilli The suspension was treated with formaldehyde in the same way as (*a*) and was found to be sterile and devoid of toxic properties

(*d*) A suspension of organisms killed by heat This suspension was of the same concentration as (*c*) and was heated for 30 min at 56° C After this treatment the suspension was sterile and non-toxic

Immunisation of rabbits—Rabbits weighing between 2 and 3 kg were given weekly subcutaneous injections of the pertussis preparations in increasing amounts each week. 10 rabbits received the extract treated with formaldehyde and 3 the heated extract, 6 rabbits were injected with the formaldehyde-treated bacilli and 3 with the heated bacilli The subcutaneous route was chosen because from previous work the impression had been gained that it was more likely to yield antitoxin than intravenous inoculation The opportunity was taken however, of including in the series 3 rabbits inoculated intravenously with preparation (*a*) to obtain direct evidence on this point The courses of immunisation followed a common plan, each rabbit receiving a total dose of 6–7 c cm over a period of 8–9 weeks At the end of the course of injections the rabbits were left without treatment for 7 days before the following tests were made

Active immunity of rabbits to toxin given intradermally—The treated rabbits were compared with one another and with normal controls as regards immunity to toxin, by intradermal inoculation of graded doses of toxic extract The rabbits were observed daily until the sixth day, when the final readings were made, the highest dilution of toxin which produced a definite necrotic area was taken as the end-point By comparing the reactions of the immunised rabbits with those of control rabbits, the approximate number of m r d of toxin to which the rabbits were immune was determined

Active immunity of rabbits to toxin given intravenously—About 3 weeks after completion of the intradermal test all the rabbits which had been immunised with formaldehyde-treated toxin and 3 of those which had received formaldehyde-treated bacilli were also tested for their resistance to toxin injected intravenously It was found that the lowest dose of toxin which always killed a normal rabbit within 24 hours was 0 15 mg per kg body-weight nd this dose was taken as the lethal dose The immunised rabbits received from two to fifty times this dose

---

* In Great Britain the term 'formalin' is frequently used as a synonym for liquor formaldehydi an aqueous solution containing approximately 40% of formaldehyde In this paper the actual quantities of formaldehyde used in the preparation of materials are stated in percentages and the terms 'formalin' and 'formalised' have not been used.

Tests with sera of immunised rabbits —The sera of the abbits, taken a few days after the final readings of the ntradermal test, were examined for antitoxin and antiacterial antibody

The examination for antitoxin was similar to that previously described (Evans 1940) Serum in varying dilutions was mixed with a constant amount of toxin (4 m r d) and the mixtures kept at room temperature for an hour, when they were injected intradermally into the skin of rabbits By this method the highest dilution of serum which would neutralise a constant amount of toxin was ascertained A valid comparison of the antitoxin contents of the different sera was obtained, because the same toxin preparation, kept throughout in the dry state, was used in all the determinations A control test with normal rabbit serum and the same toxin was made on each rabbit inoculated in this test It has been shown that pertussis toxin is neutralised by antitoxin in vitro in accordance with the rule of multiple proportions, so that the results of this test can be expressed in terms of the number of m r d neutralised by 1 c cm of serum

The antibacterial antibody content of the sera was determined by the agglutination test A suspension of living organisms was used (10^9 organisms per c cm), as it had been found to be more sensitive than either a heat killed or a formaldehyde treated suspension, and it also overcame the difficulty of spontaneous clumping, which is common with preserved suspensions of *H pertussis* The mixtures of serum dilutions and suspension were incubated at 37° C and the agglutination titre taken as the highest dilution of serum which gave definite agglutination in 4 hours

RESULTS

The results are summarised in the table Rabbits which received formaldehyde-detoxified extract acquired a high degree of immunity to the lethal and necrotising actions of the toxin, and the sera of these rabbits neutralised toxin in vitro to high titres Immunisation with this extract by the subcutaneous route resulted in a distinctly better immunity to toxin than by the intravenous route, although there was no obvious difference in the response to the bacterial antigen with these two methods

ANTIGENIC PROPERTIES OF PERTUSSIS PREPARATIONS

Rabbit number	Pertussis preparation used for immunisation	Active immunity of rabbits to toxin		Properties of rabbit sera	
		Intradermal test No of m r d to which rabbits were immune	Intravenous test No of l d injected	No of m r d of toxin neutralised by 1 c cm of serum	Agglutination titre against suspension of *H pertussis*
1	(*a*) Toxic extract detoxified by formaldehyde	256–512	5 S	5120	1 10,000
2		256–512	5 S	1280	1 10 000
3		256–512	5 S	2560	1 2560
28		128–256	50 S	2560	1 5000
29		256–512	25 S	5120	1 10,000
30		256–512	25 S	5120	1 10 000
31		128–256	5 S A	NT	NT
73		1024–2048	2 S	10,240	1 1280
74		1024–2048	2 S	10,240	1 640
75		1024–2048	2 S	10,240	1 2560
43		32–64	5 S	640	1 10,000
44		16–32	5 S	640	1 10 000
45		32–64	5 S	320	1 5000
46	(*b*) Toxic extract detoxified by heat	< 1	NT	< 40	1 10,000
47		,,	,,	,,	1 20,000
48		,,	,,	,,	1 20,000
52	(c) Bacilli killed by formaldehyde	,,	,,	,,	1 80,000
53		,,	,,	,,	1 80,000
54		,,	,,	,,	1 40,000
70			2 D 21 hr		1 40,000
71		,,	2 D 22½ ,,	B	1 10,000
72		,,	2 D 13 ,,	,,	1 20,000
49	(*d*) Bacilli killed by heat	,,	NT	,,	1 80,000
50				,,	1 80 000
51		,,	,,		1 80,000
59	None (two typical controls)	,,	2 D 20½ hr	,,	< 1 10
76		,,	2 D 18 ,,	,,	< 1 10

All rabbits immunised by subcutaneous injection, except Nos 43, 44 and 45, which were given preparation (*a*) intravenously

S = survival D = death NT = not tested A = Resistance to larger doses not tested B = 0 1 c cm of each of these sera failed to neutralise 4 m r d of toxin, smaller doses of toxin not used

Rabbits immunised with heated extract, heated bacilli or formaldehyde-treated bacilli showed no active immunity to the necrotising action of toxin, and their sera did not contain any detectable antitoxin Moreover, 3 rabbits immunised with formaldehyde-treated bacilli all died after intravenous injections of only two lethal doses of toxin All the preparations stimulated the production of antibacterial antibody, as shown by the agglutination test In general, higher antibacterial titres were obtained with the sera of the rabbits which had received suspensions of whole bacilli, killed by heat or formaldehyde.

DISCUSSION

These experiments have shown that an extract of *H pertussis* detoxified by formaldehyde is able to stimulate the production of antitoxin and antibacterial antibody *in rabbits* They have also shown that the antigenic property of the toxin is destroyed by heating at 56° C, and that therefore in the preparation of extract high temperatures must be avoided It is not known why toxin extracted from the bacillus behaves as an antigen while the same amount of toxin present in, or attached to, the bacterial cell does not It may be that when the toxin is part of the bacterial cell it is present only in a relatively small amount compared with the bacterial antigen, and that the immunising mechanism of the rabbit is preoccupied by and responds mainly to the bacterial antigen rather than to the toxin Teissier and his collaborators, who were also unable to obtain antitoxin by using a formaldehyde-treated suspension, suggested that the killed bacilli, when injected into animals, were ingested by the leucocytes which destroyed the toxin so that it was incapable of acting antigenically Flosdorf and others (1941), on the other hand, state that formaldehyde-treated whole bacilli do immunise rabbits against the dermonecrotic action of toxin, but they quote no experiments to show whether the sera of such rabbits contain antitoxin

The pertussis vaccines which have hitherto been used in the prophylactic treatment of whooping-cough have been made from whole bacilli, killed either by heat or by chemical reagents, such as phenol or 'Merthiolate,' which also render them non-toxic The experiments reported in this paper suggest that, as the modified toxin contained in these vaccines is part of the bacterial cell, it is unlikely to behave antigenically, so that such vaccines probably produce antibacterial antibody only Vaccines which have been made from bacilli killed by heat do not, indeed, contain any antigenically active toxin, but it is not yet known what effect phenol or merthiolate may have on the antigenic properties of the toxin

So far, an extract of disintegrated *H pertussis*, detoxified by formaldehyde, is the only preparation demonstrably capable of producing a serum which is both antitoxic and antibacterial Whether the protection against whooping-cough obtainable by using such a preparation would be more complete than that which is afforded by the antibacterial antibody evoked by the ordinary vaccines is a question which can only be answered finally by clinical trials It may be more advantageous to use not merely the extract treated with formaldehyde, but a vaccine containing both extract and whole bacilli, since the experiments reported here have shown that an antibacterial serum of higher potency is obtained from whole organisms than from extract There is, however, the possibility that the addition of bacilli to the extract may interfere with the antigenic property of the toxin, and whether such interference would occur is being investigated In view of the potency of pertussis toxin and its lethal and necrotic properties, one would suppose that it might be a factor in establishing infection by damaging tissue in advance of invasion, and that antitoxic immunity would therefore have a prophylactic value This supposition is supported by the recent work of Strean and others (1941), who are of the opinion, based on clinical results, that pertussis toxin can be used to test susceptibility of children to whooping-cough in the same way as Schick toxin is used in diphtheria These workers have also obtained results which indicate that serum containing pertussis antitoxin, given therapeutically, has a beneficial effect on the course of the disease It will be interesting to see whether these preliminary results are confirmed on a larger scale If so, there will be no reason to doubt the importance of pertussis toxin, and good grounds for believing that something would be gained in prophylactic treatment by stimulating the production not only of antibacterial antibody but also of antitoxin

SUMMARY

Experiments have shown that a toxic extract of *H pertussis*, obtained by disruption of bacilli by physical methods when detoxified with formaldehyde is capable of producing antitoxin and antibacterial antibody on injection into rabbits. A suspension of whole bacilli treated with formaldehyde did not act in the same way, but only gave antibacterial antibody, as did heated bacilli and heated extract

It is suggested that any investigation into new types of vaccine for prophylactic immunisation against whooping-cough should take into consideration the significance of the toxin in infection and the value of the toxoid as an immunising agent. By using a vaccine capable of stimulating the production of antitoxin in addition to antibacterial antibody a more complete protection may be established than that which has hitherto been obtained

REFERENCES

Bordet J and Gengou O (1909) *Ann Inst Pasteur* 23 415
Cruickshank, J C and Freeman, G G (1937) *Lancet* ii 567
Demnitz, A., Schlüter, W and Schmidt H (1936) *Klin Wschr* 15 10
Evans D G (1940) *J Path Bact* 51 49
— and Maitland H B (1937) *Ibid* 45 715
Flosdorf, E W, Bondi A and Dozois T F (1941) *J Immunol* 42, 133
— and Kimball A C (1940) *Ibid* 39 475
Maclean I H (1940) *Proc R Soc Med* 33 425
Miller, J J Jun. (1934) *J Immunol* 26 247
Strean L P and Grant, G A. (1940) *Canad med Ass J* 43, 528
— Lapointe D and Dechene E (1941) *Ibid*, 45, 326
Teissier P, Reilly J Rivalier E and Cambessédès H (1929) *J Physiol Path gén* 27, 549

CTAB. A NEW DISINFECTANT AND CLEANING AGENT

J M BARNES MB CAMB

(*Sir William Dunn School of Pathology, Oxford*)

THIS paper reports some investigations into the behaviour of cetyltrimethylammonium bromide (called hereafter CTAB) one of a large group of synthetic detergents widely used in industrial processes. The group may be divided into two categories, depending on whether the alkyl radical carries a positive or a negative charge. CTAB belongs to the first category, called by Kuhn (1940) the 'invert soaps" and by Baker and others (1941) the 'cationic detergents', they are powerful bactericidal agents and were described by Domagk who worked with a commercial preparation known as 'Zephirol' (in England 'Zephiran' Bayer). Zephirol is a mixture of a number of these cationic detergents in an odourless colourless and faintly alkaline solution, and it is said to be harmless when applied to the skin (Domagk 1935). Kuhn and Bielig (1940) pointed out that the antibacterial properties of the cationic detergents greatly exceeded those of their anionic counterparts. They give details of the behaviour of the cationic detergents towards proteins, enzymes and living cells. Baker and others (1941) further investigated the bactericidal properties of a number of these substances, and examined over 15 commercial preparations. They confirmed that the cationic group was much more active than the anionic group of detergents and that the latter was unable to destroy gram-negative organisms. The cationic group destroyed such organisms but required higher concentrations than those needed to kill the gram-positive bacteria. Baker and others also showed that the bactericidal power of these detergents was inhibited in the presence of certain phospholipids

The substance CTAB used in these experiments was obtained from Imperial Chemical Industries Ltd, and the crude preparation was employed. This is a brown greasy powder that readily dissolves in warm water to give a clear solution with a distinct fishy odour. The smell is certainly not pleasant, but it does not cling to the skin after the solution has been used, nor does it hang about in rooms where the preparation has been used for cleaning. A 1% solution of CTAB is neutral, feels soapy to the touch and is not painful when applied to raw surfaces. It precipitates serum proteins and is not precipitated by calcium. There is no evidence that tissue damage follows its application to raw surfaces, but a 1 : 1000 solution will rapidly destroy leucocytes in vitro, the cells are completely broken up *

The work described below is an attempt to assess the power of CTAB to destroy bacteria under conditions likely to be met with in hospital practice. A 1% solution was used almost entirely, because this is far above the minimum needed to kill bacteria in vitro, and at this concentration the substance is an excellent cleansing agent for skin, greasy bowls and so on

RESULTS

Action on normal skin.—A number of tests were carried out to see whether solutions of CTAB would remove bacteria from normal skin. An area of the forearm 6 in by 4 in was marked out and a wool swab soaked in broth was rubbed over the area for a minute, and then dropped into 100 c cm of broth. The same area was then cleaned by rubbing it for 3 min with fresh swabs soaked in 1% CTAB. The swabs were rubbed vigorously and rapidly over the skin so as to obtain a good lather. The arm was held under the running tap for a minute in order to remove excess of the CTAB, and swabs soaked in broth were again rubbed over the area for a minute and transferred to broth as before. 1 c cm of the broth was then transferred to 10 c cm of molten agar and a plate poured from this. This follows the technique described by Colebrook (1930), and eliminates the possibility of carrying over enough of the disinfectant on the second swab to inhibit the growth on the plates. The counts from areas of the arm before and after washing with CTAB were as follows

Before	363	431	240	38	34
After	2	9	0	2	0

From the work of Price (1938) it can be assumed that the simple rubbing of the skin with the broth-soaked swab would not materially reduce the count from a similar swab taken a few minutes later

Sterilisation of the hands is clearly a more difficult problem than that involved in the tests just described owing to the presence of the numerous skin folds round the nails, &c. Colebrook's technique was again adopted the hands being swabbed for a minute with wool swabs soaked in broth and the swabs then dropped into 100 c cm of broth. The hands were then washed for 5 min with wool soaked in 1% CTAB and a good lather was worked up. At the end of this period the hands were rinsed for a minute under the tap, and swabs again taken as before the washing. Cultures and plates were made as before. The number of colonies per c cm of broth were

Before	1410	109	625	415	79	547	159
After	150	17	133	82	9	140	21

In further experiments the hands were washed in the same way but the rinsing was not so thorough. The hands were then dried on a sterile towel and sterile surgical gloves were donned. After periods of 1½–2 hours the gloves were removed and the hands were swabbed as before. The counts were:

Before	29	81	21	200	220	86
After	8	10	3	13	18	19

The experiments indicate that the reduction in the bacterial count was well maintained for at least 2 hours

Action on wounds.—Over a period of several months a 1% solution of CTAB has been used to clean fresh and infected burns. In fresh burns it has been used in the place of ordinary soap and water for cleansing on the admission of the patient, it cleans the skin rather more efficiently than ordinary soap, and its application is not painful. It has also been found useful for cleaning infected burns, and it readily removes crusts, small sloughs and pus. It must be emphasised however, that although the surface of the burn looked very clean, swabs taken before and after the cleaning yielded equally profused growths of whatever organism was growing there †. It is not clear why the rubbing of a granulating surface for a minute with a 1% solution of CTAB completely fails to sterilise it.

---

* This test was carried out for me by Mrs M A Jennings

† I am indebted to Dr R L Vollum for these results

Bowls and baths.—A few experiments were carried out to see whether solutions of CTAB would sterilise, as well as clean, dirty and greasy bowls and baths. Small bowls (1 litre capacity), which were not grossly chipped, were smeared with 'Vaseline,' and then 20 c.cm. of a broth culture of streptococci was rubbed in with the grease; 100 c.cm. of 1% CTAB was next poured into the bowl, and the interior cleaned manually with wool swabs for ½–1 min. The bowl was emptied, and rinsed several times under the running tap to remove excess of the detergent. The interior of the bowl was quite clean and free from grease. This was done six times, and every time swabs taken *from the sides of the bowls after they had been cleaned were sterile.* Cleaning the bowls in the same way with soap and water reduced but did not eliminate the organisms. In another case a large bowl (3 litres capacity), which had been used on the previous day to collect infected dressings from a case of burns and had numerous small crusts of dried pus adherent to its walls, was cleaned with CTAB; 100 c.cm. of a 1% solution was poured into the bowl, which was cleaned manually for 2 min. with wool swabs and then thoroughly rinsed. Tests made before cleaning showed a profuse growth of staphylococci, streptococci, and *Pseudomonas pyocyanea*; after cleaning swabs taken from the sides were sterile.

An attempt was made to sterilise a bath. In the first instance a ward bath was examined after a patient with a colostomy had been given a bath. Tests from the sides yielded a profuse growth of staphylococci, streptococci, *Bacterium coli* and numerous spore-bearing saprophytes. The bath was then cleaned for 5 min.; wool swabs were rubbed all over the bath by two men, using altogether 250 c.cm. of 2% CTAB. The bath was next drained, and filled three times with cold water to remove excess of the detergent. Bacteriological tests from the sides after this revealed the growth of only a few spore-bearing saprophytes. In this case samples of the bath water used by the patient were removed, and various quantities of CTAB solution were added to parts of the sample. Cultures previously rich in the organisms enumerated above became completely sterile a few minutes after adding enough CTAB to bring the final concentration up to only 1 : 40,000.

On the second occasion the bath was filled with water at 105° F. and a bowl full of septic dressings was emptied into it, together with a number of pieces of vaseline gauze. The bath was stirred and left for 30 min., when the dressings were removed and the bath drained. Tests from the sides gave a prolific growth of staphylococci, streptococci and *Ps. pyocyanea*. The bath was then cleaned as described above for 5 min. by two men using 500 c.cm. of 1% CTAB, and drained and rinsed as before. The same tests from the sides showed the bath to be completely sterile.

DISCUSSION

It has been shown that CTAB, in addition to socially cleaning the normal skin, materially reduces the number of bacteria present on it. Clinical experience has shown it to be painless, and apparently harmless, when applied to raw surfaces. Its use should, therefore, provide a good substitute for the soap-and-water technique which is finding increasing popularity among surgeons called on to treat dirty wounds. It is probably as active a germicide as any of the disinfectants commonly used for preparation of the skin before operation, and could therefore replace spirit or the dye preparations favoured by some surgeons for this purpose. Its habitual use for cleaning the hands may not be without risk, for it has been reported that the frequent use of these "wetting" agents by industrial workers for cleansing the skin increases their liability to become sensitised to the chemicals with which they work (Schwartz 1940). But such dangers should not follow its occasional application on patients.

The solution is also useful for cleaning the dirty surfaces of infected burns, &c., and in my experience has proved much superior for this purpose to saline or 0.05% electrolytic hypochlorite. In one case of extensive burns CTAB was thus used several times a week for some months, and the normal skin round the lesions did not seem to be in any way injured by the applications.

Another important use for CTAB may be the cleaning and sterilisation of infected bowls and baths which are too bulky to be sterilised conveniently by heat. An example of this is the saline bath sometimes used in the treatment of burns, the sterilisation of which at present necessitates the use of abrasives and pure lysol. The cleaning process is tedious, and lysol is dangerous to handle. A useful safeguard in the treatment of infected cases in the bath would be the addition of a little CTAB to the water; as shown above, the substance is bacteriostatic in very high dilutions. It may be added that the cost of cleaning the bath by the method described was about ½*d*.

Further work should be done on this group of substances so that a preparation active against all varieties of bacteria, and free from any unpleasant smell, may—if possible—be made available. Such a preparation would probably be a mixture of a number of these compounds, for as Baker and his colleague have shown, they vary appreciably in their activity towards different organisms.

SUMMARY

Experiments with solutions of cetyltrimethylammonium bromide (CTAB), a cationic detergent, have shown it to be capable of materially reducing the number of bacteria on normal skin, and of completely sterilising dirty and greasy bowls and baths.

Clinical uses for this substance are suggested, since its application to normal skin and wounds seems to be without danger.

I have to thank Dr. C. M. Scott of Imperial Chemical Industries Ltd. for generous supplies of CTAB; also Prof. H. W. Florey and Colonel Leonard Colebrook for their advice during this work. A/C L. Irwin and A/C E. Challon gave useful technical assistance.

REFERENCES

Baker, Z., Harrison, R. W. and Miller, B. F. (1941) *J. exp. Med.* **74**, 611.
Colebrook, L. (1930) Ministry of Health. Appendix to Interim Report of Departmental Committee on Maternal Mortality and Morbidity, London.
Domagk, G. (1935) *Dtsch. med. Wschr.* **61**, 829.
Kuhn, R. and Bielig, H. J. (1940) *Ber. dtsch. chem. Ges.* **73**, 1080.
Price, P. B. (1938) *J. infect. Dis.* **63**, 301.
Schwartz, L. (1941) *Publ. Hlth Rep. Wash.* **56**, 1788.

MIDDLE MENINGEAL HÆMORRHAGE
AFTER HEAD INJURY WITHOUT FRACTURE OF THE SKULL

M. A. Falconer
M.CH. N.Z., F.R.C.S.

F. Schiller
M.D. PRAGUE

(*Nuffield Department of Surgery, Oxford*)

It is common teaching that extradural bleeding from the middle meningeal artery after head injury is invariably associated with fracture of the skull. Peet (1940) in a recent monograph states in italics: "A linear fracture passing obliquely forward and downward from the parietal region toward the middle fossa is shown by the X ray." Munro and Maltby (1941) in reporting their observations on 44 cases write: "We have yet to see an extradural hæmatoma in the absence of a fracture of the bone in the immediate vicinity of the bleeding point—providing an adequate search for the latter has been made." McKenzie (1938) concedes that cases have been described without fracture, but says: "These cases are so rare that the absence of a linear fracture in good bilateral radiographs is strong evidence against the diagnosis of an extradural hæmorrhage." We are therefore reporting two examples of middle meningeal hæmorrhage, both of which occurred with an intact skull.

CASE-RECORDS

Case 1.—An army driver, aged 30, was in a lorry which overturned on March 14, 1941, but he was not *hurt*. On the next night he went to a party and probably drank excessively; there was some question of his having been struck over the right ear, but he was able to return to his billet alone. Next morning, March 16, he could not speak properly and complained of headache and of weakness of his right arm. He was thought at first to be suffering from a "hangover," but later he became drowsy and incontinent of urine.

On the 17th he was admitted to the Radcliffe Infirmary. Though drowsy he cooperated on examination. No evidence of external injury Moderate nominal aphasia, with considerable weakness of the right lower face and of the right upper limb Tendon jerks increased in the right limbs, abdominal reflexes absent on the right side, and both plantar reflexes extensor Pupils equal in size and reacted normally No papilloedema Pulse rate 70 per min , blood pressure 105/70 mm Hg Serial X rays of the skull did not show a fracture, but showed a slight shift of a calcified pineal gland to the right Lumbar puncture yielded clear cerebrospinal fluid (cells 2 per c mm , protein 25 mg per 100 c cm) under a pressure of 120 mm of water Electroencephalography revealed a large silent area over the lateral aspect of the left hemisphere , elsewhere over both cerebral hemispheres there were abnormal high voltage waves with a periodicity of 1–2 a second A diagnosis of subdural hæmatoma was made, but exploration of the subdural space through burr holes placed over each parietal eminence and in the left frontal region did not reveal a hæmatoma The intracranial tension did not seem to be raised, for on opening the dura the brain fell away from the skull

His clinical state remained unchanged, and the possibility of a hæmorrhage into an intracranial tumour, or of an intracerebral hæmatoma, was considered On March 19 ventriculography revealed a well marked shift of the whole ventricular system to the right without deformation of the ventricles Under local anæsthesia a left frontal scalp flap was reflected The skull showed no fracture A burr hole in the temporal fossa disclosed an extradural hæmatoma 2 5 cm in depth and 10 cm in diameter The opening in the skull was enlarged and the clot removed with scoop and sucker Brisk arterial bleeding was encountered from the middle meningeal artery and was controlled with endothermy The wound was then closed Rapid improvement in the patient's condition followed this operation, but he was left with a very slight permanent weakness of his right arm and leg and a slight hesitancy of his speech Air encephalography performed 3 months later showed a slight enlargement of the left lateral ventricle without deformity of its outline or shift of the ventricular system In July, 1941, 4 months after his injury, he returned to his unit after sick leave, but he was unable to cope with the rigours of Service life He developed troublesome headaches and was invalided out of the Army in November, 1941

CASE 2 —A schoolgirl, aged 12, fell off her bicycle about noon on Sept 24, 1941, but picked herself up and rode home , 2 or 3 hours later she developed a severe generalised headache and shortly afterwards became drowsy and incontinent of urine She was admitted to the Radcliffe Infirmary 30 hours after her fall She was then very drowsy, though she could be roused with difficulty On waking she answered questions clearly for about half a minute before turning over on to her side and going to sleep again No marks of external injury Positive neurological signs included bilateral ptosis, defective upward movement of the eyeballs, and a 3rd cranial nerve palsy on the right side, almost complete with the exception that the right pupil, which was more dilated than the left, reacted to direct and consensual light stimulation Both optic discs were normal No definite weakness of the face or of any of the limbs, but the tendon reflexes of the left arm and leg were a little brisker than on the right side and the left abdominal reflexes were absent The left plantar response was extensor and the right plantar response sometimes extensor and sometimes flexor Pulse rate 60 per min , blood pressure 125/80 mm Hg Serial X rays of the skull did not show any fracture or other abnormality Lumbar puncture released clear fluid (cells 3 per c mm , protein 30 mg per 100 c cm) under a pressure of 190 mm of water

Subdural hæmorrhage was diagnosed, but exploration of the subdural space through biparietal burr holes made under local anæsthesia did not reveal a hæmatoma The brain however bulged through the openings made in the dura A small vertical incision was then made in the right temporal fossa and carried through scalp and muscle to the bone (M A F) The skull was intact but transmitted the dark colour of an underlying extradural hæmatoma which was exposed by a craniotomy opening 5 cm in diameter The clot was between 4 and 5 cm thick and extended from the frontal pole backwards for 13 cm It was removed with the sucker Profuse bleeding was encountered from a point on the anterior branch of the middle meningeal artery about 5 cm from the foramen spinosum and was controlled with endothermy The wound was then closed After operation the patient improved, slowly at first, remaining drowsy for a few days Recovery subsequently quickened and after 10 days she was free of all abnormal neurological signs When examined 3 months later (January, 1942) she had been back at school for a month and was symptom free

DISCUSSION

These 2 cases are examples of middle meningeal hæmorrhage with delayed onset of symptoms The correct diagnosis was not made when they were first seen mainly because of the modern dictum that all cases of extradural hæmorrhage are associated with fracture of the skull Similar cases have been recorded occasionally (Keith, quoted by McKenzie 1938, Turner 1941, and others) but the fact that they occur has not been realised sufficiently in recent years In 1886 Jacobson, in his classic description of the syndrome of middle meningeal hæmorrhage, wrote " While in the great majority of cases the skull is fractured, and the middle meningeal or one of its chief branches laid open where the fracture crosses the vessel, the existence of a fracture is not necessary for the production of middle meningeal hæmorrhage " He collected 71 cases, in 3 or possibly 4 of which there was no fracture

No better explanation has been given of the mechanism responsible for the extradural hæmatoma in these cases than the following, put forward by Sir Charles Bell in 1816 and quoted by Jacobson " It is extraordinary that anyone who has ever raised the skull-cap in dissection, and felt the strength of the universal adhesions of the dura mater to the lower surface of the bone, could for an instant believe that the arteria meningea media has the power of throwing out its blood, to the effect of tearing these adhesions from the entire half of the cranium ! Strike the skull of the subject with a heavy mallet on dissecting, you find the dura mater to be shaken, at the part struck Repeat the experiment on another subject, and inject minutely with size injection, and you will find a clot of the injection lying betwixt the skull and the dura mater, at the part struck, and having an exact resemblance to the coagulum found after violent blows on the head I imagine this is conclusive "

We wish to thank Prof Hugh Cairns, who operated on case 1, for his advice and assistance with this paper, and Squadron Leader Denis Williams for the electroencephalography report

REFERENCES

Bell, C (1816) Surgical Observations London
Jacobson, W H A (1886) *Guy s Hosp Rep* 43, 147
McKenzie, K G (1938) *Brit J Surg* 26 346
Munro, D and Maltby, G L (1941) *Ann Surg* 113, 192
Peet, M M (1940) in Injuries of the Skull, Brain and Spinal Cord, edited by S Brock, London
Turner J W A (1941) *Brit med J* ii 569

Medical Societies

MEDICAL SOCIETY OF LONDON

The Return to Work

A RECENT meeting of the Medical Society of London considered that most urgent question, how to avoid the wastage of man-power due to physical injury, or in other words how to make the best use of the services of those who by reason of such injury may be unable to resume their former work Three points of view were put by Mr H E **GRIFFITHS**, who has been largely responsible for the organisation of the Albert Dock Hospital , Colonel F D **HOWITT**, who has had great experience of physical medicine , and Dr D C **NORRIS**, a member of the executive committee of the Queen Elizabeth Training College for the Disabled (Leatherhead)

Mr Griffiths had no use for the scheme to send young men for a year or so to a university in order to give them a taste for higher education before being called up for military service Unless we were prepared to give up such luxuries as academic distinctions, there would be no higher education for us for long enough Rehabilitation must be studied as an immediate means of increasing man-power Doctors were too much inclined to think in terms of an imaginary " normal " type, any deviation from which implied some reduction of industrial efficiency in fact, only one occupation required perfect anatomical integrity—that of artist's model Most work could be done with half the normal range of joint movement , a navvy could carry on with complete ankylosis of one shoulder. The wide variation in the risk of injury in different occupations was reflected in the rates of premium charged by insurance companies covering employers' liability—e.g., 2s. 6d. % for a milliner or musician, against 250s. % for a demolition labourer.

Most of the disabilities which prevent a man from getting back to work are not the direct and necessary result of the original injury, but arise during treatment; thus, he may have a limb in which the bone has united firmly in good position, but the muscles are wasted and the joints stiff. Such complications may be avoided. A man undergoing training under medical supervision for heavy work needs more food than is usually provided in a hospital. Mr. Griffiths concluded by asking eminent surgeons to leave their gastrectomies and thyroid excisions to their houseman, and to concentrate on the treatment of minor injuries.

Colonel Howitt deplored that medical students are not adequately taught about physiotherapy, so that few doctors know how to prescribe such treatment. After the last war there was a great development of occupational therapy in America and elsewhere, much less in this country. In the Army the educational corps had given attention to the problem how to help patients in hospital to spend their time profitably, and physical training centres had been organised to upgrade sub-standard recruits—how to maintain good posture, how to walk, how to lift weights. Exercises were best carried out by teams, introducing an element of collaboration, with which competition might usefully be combined.

Dr. Norris showed photographs, models, and a film of the training college for the disabled at Leatherhead where there is accommodation for over a hundred cripples, drawn from special schools and from hospitals all over the country; three-quarters of the beds have now been reserved by the Ministry of Labour, and training is carried on in a variety of trades including engineering, welding, spray-painting (one of the few occupations in which a one-armed man can do really well) gardening, cooking, carpentry, and clerical work. The aim is to select a course of training that will fit the patient for a job in which he can compete on equal terms with uninjured workers. There is liaison with employers who have already taken these trainees and with their help training can be directed towards a particular job into which the man can be drafted when he has completed his training, and passed any test usually applied to entrants—e.g., the Admiralty examinations for metal workers or welders. The film showed trainees assembling for fire-drill, working in the engineering and welding shops and enjoying football and cricket. Two boys, both minus a lower limb, were putting up a lively boxing match.

In the discussion which followed a plea was made for closer contact between doctors and industry, and a more intelligent selection of workers for particular jobs. Sir James Walton agreed that surgeons should consider how best to further national war effort; he emphasised the importance of securing the right type of director for a rehabilitation centre.

Reviews of Books

The Universal Constant in Living

F. MATTHIAS ALEXANDER. London: Chaterson. Pp. 270. 15*s.*

THE inhibition of a habitual mode of action and its replacement by a consciously planned new mode is extremely difficult, and according to Alexander, is not made easier by the fact that our proprioceptors mislead us in the process. Many respected medical men testify to the success of Alexander's technique in overcoming this difficulty, thereby making life livable for many who would otherwise have been incapacitated. He claims that he does not attack the fault (such as stammering or faulty posture) directly, but that by inculcating a new manner of "use" of the whole "self" he so improves the person's physical and mental relationship to his environment that the fault disappears incidentally. Efforts to achieve the end without a fundamental change in the "use of the self" can at best be only partly successful; and he criticises conventional systems of improving physical fitness, teaching proficiency in games, correcting deformities, curing psychophysical disorders like stammering, and even diagnosing diseases. Faulty "use of self" is almost universal, but can be replaced, not without difficulty, by a proper use. Alexander claims to have discovered a general law of self-use as distinct from a successful method of retraining individuals to overcome specific faults; and at least one eminent philosopher and a sprinkling of scientists and other celebrities believe that his claim is justified. This book, however, while successfully conveying the idea, excites rather than satisfies our curiosity regarding the actual evidence.

Marketing and Sale of Medicines

H. E. CHAPMAN, barrister at law. Bedford: Henry Burt and Son. Pp. 169. 7*s.* 6*d.*

THIS book on the law of medicines usefully summarises provisions which have been greatly changed by the Pharmacy and Medicines Act, 1941. The successful compromise between the Treasury (which had undertaken to repeal the curious old medicine duties), the Home Office (interested in controlling the sale of poisons), the Ministry of Health (securing at last some restriction of the abuses of advertising remedies for certain diseases) and the distributive traders (whose special training was worth encouragement in the public interest) has introduced complications which make guidance desirable. Mr. Chapman is a barrister who is also a member of the Pharmaceutical Society and the general secretary of the Proprietary Articles Trade Association. He writes not so much for those who prescribe and dispense medicine as for those who manufacture, advertise, pack, label and sell it. For these it should prove a trustworthy and reasonably comprehensive manual.

Treatment of the Patient Past Fifty

ERNEST P. BOAS, M.D., associate physician, Mt. Sinai Hospital, New York City; assistant clinical professor of medicine, Columbia University. Chicago: Year Book Publishers. London: H. K. Lewis. Pp. 324. 22*s.*

WE have suggested already that geriatrics hardly deserves to be developed into a specialty, though it doubtless needs fresh study in these days when the young become fewer and the old more numerous at a startling rate. Dr. Boas's book bears this out. In the short opening chapters he distinguishes the physical and mental processes of ageing from those of disease. Arteriosclerosis, he argues, is a pathological process, not an involutive one. He points out we know nothing of the mechanisms that control ageing except that there is a potent hereditary factor. Of the causes of arteriosclerosis, coronary disease, senile emphysema, essential hypertension, and the like, we know still less; the wear and tear of modern life is not a factor in bringing about their apparent increase in incidence; this, he thinks, is simply due to the fact that modern hygiene, by reducing the death-rate from infections at earlier ages, has lengthened the average duration of life, and thus allowed the degenerative diseases to develop in many who would otherwise have died young. The major problem in the management of the ageing patient, indeed of the ageing subject, he finds to be the social problem of providing him with work commensurate with his powers, and so keeping him in active functional relationship with society. The minor problems of his altered needs in the way of diet, sleep, rest and exercise are not difficult. Otherwise the book is a systematic account of those diseases which are common in the patient past fifty, differing little in scope from the corresponding parts of a good standard textbook. But it is well done, in a beautifully simple clear-cut style, modern in outlook, unencumbered by superfluous detail. Where the elderly patient's reactions to disease, as in tuberculosis and pneumonia, are significantly different from those in younger people this is duly emphasised. It is of interest that sulphapyridine is not mentioned; sulphathiazole and sulphadiazine have ousted it in America. On the whole then, the book is an excellent short presentation of its subject; but do we agree with the author that the chief task of medicine during the coming generation is the extension of the human life span? Surely it is the achievement and enrichment of health throughout life.

shoulder. The wide variation in the risk of injury in different occupations was reflected in the rates of premium charged by insurance companies covering employers' liability—e.g., 2s. 6d. % for a milliner or musician, against 250s. % for a demolition labourer.

Most of the disabilities which prevent a man from getting back to work are not the direct and necessary result of the original injury, but arise during treatment; thus, he may have a limb in which the bone has united firmly in good position, but the muscles are wasted and the joints stiff. Such complications may be avoided. A man undergoing training under medical supervision for heavy work needs more food than is usually provided in a hospital. Mr. Griffiths concluded by asking eminent surgeons to leave their gastrectomies and thyroid excisions to their houseman, and to concentrate on the treatment of minor injuries.

Colonel Howitt deplored that medical students are not adequately taught about physiotherapy, so that few doctors know how to prescribe such treatment. After the last war there was a great development of occupational therapy in America and elsewhere, much less in this country. In the Army the educational corps had given attention to the problem how to help patients in hospital to spend their time profitably, and physical training centres had been organised to upgrade substandard recruits—how to maintain good posture, how to walk, how to lift weights. Exercises were best carried out by teams, introducing an element of collaboration, with which competition might usefully be combined.

Dr. Norris showed photographs, models, and a film of the training college for the disabled at Leatherhead where there is accommodation for over a hundred cripples, drawn from special schools and from hospitals all over the country; three-quarters of the beds have now been reserved by the Ministry of Labour, and training is carried on in a variety of trades, including engineering, welding, spray-painting (one of the few occupations in which a one-armed man can do really well), gardening, cooking, carpentry, and clerical work. The aim is to select a course of training that will fit the patient for a job in which he can compete on equal terms with uninjured workers. There is liaison with employers who have already taken these trainees and with their help training can be directed towards a particular job into which the man can be drafted when he has completed his training, and passed any test usually applied to entrants—e.g., the Admiralty examinations for metal workers or welders. The film showed trainees assembling for fire-drill, working in the engineering and welding shops, and enjoying football and cricket. Two boys, both minus a lower limb, were putting up a lively boxing match.

In the discussion which followed a plea was made for closer contact between doctors and industry, and a more intelligent selection of workers for particular jobs. Sir James Walton agreed that surgeons should consider how best to further national war effort; he emphasised the importance of securing the right type of director for a rehabilitation centre.

Reviews of Books

The Universal Constant in Living

F. MATTHIAS ALEXANDER. London: Chaterson. Pp. 270. 15s.

THE inhibition of a habitual mode of action and its replacement by a consciously planned new mode is extremely difficult, and, according to Alexander, is not made easier by the fact that our proprioceptors mislead us in the process. Many respected medical men testify to the success of Alexander's technique in overcoming this difficulty, thereby making life livable for many who would otherwise have been incapacitated. He claims that he does not attack the fault (such as stammering or faulty posture) directly, but that by inculcating a new manner of "use" of the whole "self" he so improves the person's physical and mental relationship to his environment that the fault disappears incidentally. Efforts to achieve the end without a fundamental change in the "use of the self" can at best be only partly successful; and he criticises conventional systems of improving physical fitness, teaching proficiency in games, correcting deformities, curing psychophysical disorders like stammering, and even diagnosing diseases. Faulty "use of self" is almost universal, but can be replaced, not without difficulty, by a proper use. Alexander claims to have discovered a general law of self-use as distinct from a successful method of retraining individuals to overcome specific faults; and at least one eminent philosopher and a sprinkling of scientists and other celebrities believe that his claim is justified. This book, however, while successfully conveying the idea, excites rather than satisfies our curiosity regarding the actual evidence.

Marketing and Sale of Medicines

H. E. CHAPMAN, barrister at law. Bedford: Henry Burt and Son. Pp. 169. 7s. 6d.

THIS book on the law of medicines usefully summarises provisions which have been greatly changed by the Pharmacy and Medicines Act, 1941. The successful compromise between the Treasury (which had undertaken to repeal the curious old medicine duties), the Home Office (interested in controlling the sale of poisons), the Ministry of Health (securing at last some restriction on the abuses of advertising remedies for certain diseases) and the distributive traders (whose special training was worth encouragement in the public interest) has introduced complications which make guidance desirable. Mr. Chapman is a barrister who is also a member of the Pharmaceutical Society and the general secretary of the Proprietary Articles Trade Association. He writes not so much for those who prescribe and dispense medicine as for those who manufacture, advertise, pack, label and sell it. For these it should prove a trustworthy and reasonably comprehensive manual.

Treatment of the Patient Past Fifty

ERNEST P. BOAS, M.D., associate physician, Mt. Sinai Hospital, New York City; assistant clinical professor of medicine, Columbia University. Chicago: Year Book Publishers. London: H. K. Lewis. Pp. 324. 22s.

WE have suggested already that geriatrics hardly deserves to be developed into a specialty, though it doubtless needs fresh study in these days when the young become fewer and the old more numerous at a startling rate. Dr. Boas's book bears this out. In the short opening chapters he distinguishes the physical and mental processes of ageing from those of disease. Arteriosclerosis, he argues, is a pathological process, not an involutive one. He points out we know nothing of the mechanisms that control ageing except that there is a potent hereditary factor. Of the causes of arteriosclerosis, coronary disease, senile emphysema, essential hypertension, and the like, we know still less; the wear and tear of modern life is not a factor in bringing about their apparent increase in incidence; this, he thinks, is simply due to the fact that modern hygiene, by reducing the death-rate from infections at earlier ages, has lengthened the average duration of life, and thus allowed the degenerative diseases to develop in many who would otherwise have died young. The major problem in the management of the ageing patient, indeed of the ageing subject, he finds to be the social problem of providing him with work commensurate with his powers, and so keeping him in active functional relationship with society. The minor problems of his altered needs in the way of diet, sleep, rest and exercise are not difficult. Otherwise the book is a systematic account of those diseases which are common in the patient past fifty, differing little in scope from the corresponding parts of a good standard textbook. But it is well done, in a beautifully simple clear-cut style, modern in outlook, unencumbered by superfluous detail. Where the elderly patient's reactions to disease, as in tuberculosis and pneumonia, are significantly different from those in younger people this is duly emphasised. It is of interest that sulphapyridine is not mentioned: sulphathiazole and sulphadiazine have ousted it in America. On the whole, then, the book is an excellent short presentation of its subject; but do we agree with the author that the chief task of medicine during the coming generation is the extension of the human life span? Surely it is the achievement and enrichment of health throughout life.

committed the offence with which he was charged, but were not in a position to find out the causes of his behaviour. Thus theft might be an expression of hunger, greed, jealousy, spite, a desire to shine or to please, or of bravado; these emotions might have their root in too strict or too lenient a home, in poor health or ebullient spirits, or in broken family relationships. She too felt that better and younger magistrates are needed. For children of 8 life in a supervised foster home was better than in an approved school; there they would learn how to live in society as members of society. She also thought there should be small homes where borderline mental defectives could be sent; these children, unfit to battle with life but not dull enough to be certified, cannot suitably go to an approved school; they are thus often left to the care of the probation officer who, after all, cannot be constantly at hand. Yet even with our imperfect methods of dealing with them it seems that at least 80% of our delinquents recover and become good citizens. With widening interest in their problems and better measures for their care it should be possible to reclaim the remainder.

Annotations

LESS SMOKE NOW

The Smoke Abatement Society are considering changing their name, for they rightly hold that post-war reconstruction is going to give us an opportunity not only to alter our reek but to abolish it. In the meantime soap rationing, as one of our contemporaries has lately pointed out, is bringing home to us the extravagance of our dirty ways. When we get round to completing the slum clearance scheme which Hitler has begun for us, we may be in the proper frame of mind to spend a little more to ensure that the old taunt—cleanliness may be next to godliness, but in Pittsburgh it's next to impossible—can never again be applied to our cities. But once the war is over we shall all be eager to get the place tidied up as soon as may be, and there is a danger that in our haste precautions against smoke will be forgotten. The society has therefore suggested some safeguards[1] which might well be adopted in advance. They propose first that all new installations of fuel-burning equipment, including industrial plant, should be approved by a competent authority. Smokelessness is more readily achieved in commercial buildings, such as blocks of offices, than in homes and factories, and they would not permit any open fires in new premises of this type. With the help of gas and electricity the need for open fires in the home has been greatly reduced, and an adequate supply of smokeless fuel at a reasonable price could be guaranteed for the remaining open grates. The society also suggest that smokeless areas should be enforced in the centres of our great cities—Manchester had almost achieved this when war broke out. These reservations would serve as an inspiring example of amenity and cleanliness to the rest of the city. Town-planning schemes should give special attention to the zoning of industry and the establishment of industrial estates. The society recommend also that the possibilities of district heating should be explored, and an informative appendix to their memo describes the progress it has made in America and on the Continent. The New York Steam Corporation, for instance, in 1939 supplied 1927 consumers occupying 2105 million cu. ft. of building space with steam at a pressure of 100–150 lb. to the sq. in., enough to heat some 200,000 flats of 3–4 rooms each. The society also advocate the formulation of a national fuel policy. The rationing this summer of every kind of fuel may well be a landmark in this policy, as was the rationing of foodstuffs 25 years ago in a nutrition policy.

PSYCHIATRIC SELECTION IN AMERICA

Our own attempts to devise a mesh through which only the psychologically stable can find their way into the Services have had their counterpart in America. An extract[1] from the annual report of the William Alanson White Psychiatric Foundation reviews progress since 1926, when a joint Army and Navy selective service committee was established. This body over ten years drew up a comprehensive plan for a national headquarters under which a medical division would determine policy, and supervise medical machinery and field operations. In 1938, however, rumours of war seem to have diverted the committee from their course, and they decided that the medical examiners on the local boards should only eliminate candidates with easily recognisable physical disabilities, leaving a more thorough examination to the Service doctors. In 1940 Lieut.-Colonel C. B. Spruit became medical adviser to the committee; he did not favour the idea of hurried medical inspections by the local boards, thinking this was not the sort of work to call out the voluntary coöperation of competent practitioners.

Legislation followed which established a Selective Service system under National Headquarters very much on the lines proposed by the joint committee in 1936, and an official volume on physical standards was circulated which made uniform classification of candidates possible. Meanwhile the Southern Psychiatric Association drew the Government's attention to the dearth of well-trained psychiatrists, and the White Foundation submitted a bulletin to the Selective Service System containing a plan for the psychiatric examination of candidates for military service. Discussions followed, as a result of which the War Department required induction boards to provide one psychiatric examiner for every 50 candidates examined daily; seminars were then planned in order to unify standards among Army induction board psychiatrists and all selective service psychiatry examiners; these seminars were successful and well attended. Diagnosis and procedure were discussed in relation to patients falling into the following groups: I, the mentally defective; II and III, psychopathic and cyclothymic personalities; IV, psychoneurotics; V, schizoids and schizophrenics; VI, chronic inebriates; VII and VIII, organic nervous defects or diseases; and those—chiefly in groups IV and V—with psychosomatic disorders.

Much of the success of this part of the programme depended on the vigorous psychiatric advisory committee of the Selective Service system. This body now proposed that the state medical officers should arrange for one of the autumn meetings of each county medical society to be devoted to a study of the ways in which the general practitioner can recognise the candidates he would refer on psychiatric grounds. This, however, was not so easy to achieve; it seemed that many of the local board doctors were disgruntled. They disliked having their rulings upset by Army examiners and being asked to explain by rejected patients whom they had previously passed. Moreover they resented the fact that their services were given freely while the Army induction personnel were being paid, albeit at a low rate. Certainly some odd situations had arisen; for example, doctors varied greatly in their standards for rejection, especially when it came to teeth and mental or nervous handicaps. Then the regulations required that a rejected man should be given a copy of the report on his examination; and employers might wish to see this as evidence of rejection. When the report happened to run: "Constitutional psychopathic inferiority; sexual really a logical extension of that of ALDRIDGE,[3] should greatly facilitate the efforts of those who are faced with the treatment of a dehydrated and acutely ill child.

---

[1] Smoke Prevention in relation to Initial Post-war Reconstruction. Memorandum submitted by the National Smoke Abatement Society [illegible]

[1] Reprinted in Psychiatry, 1941, 4, 440.

VITAMIN STANDARDS

WHEN in the last war anything disappeared it had usually gone for the duration but in this one sooner or later it comes back. Now the *Bulletin of the Health Organisation of the League of Nations* has reappeared, and very welcome it is. When France fell, volume 9, no. 4 was being printed in Paris and had reached the proof stage where it had to be abandoned. After more than a year Monsieur GAUTIER was able to restart publication and the material was set up again at a press in Switzerland. The subject-matter itself is singularly appropriate to sustain the cause of the free nations on whose banner is written "Coöperation not Competition," for it is a monument of joint international work. The number is entirely taken up with questions of international biological standardisation, and four of the papers are concerned with the standardisation of vitamins; the secretaries of the vitamin B_1, D and E subcommittees of the Accessory Food Factors Committee all publish important communications. Squadron Leader MACRAE describes the experimental work which he organised to enable the vitamin-B_1 standard to be changed from the acid clay-adsorbate to synthetic crystalline vitamin B_1. This change had been achieved by correspondence before the war but the experimental work is only now reported in full. It is interesting to look at the table of participants in the experiments; first come OHDAKE of Tokyo, followed by DI MATTEI of Pavia, E. MERCK of Darmstadt and the I. G. Farbenindustrie, together with a great many non-enemies. In the scientific world cooperation persisted perhaps longer than anywhere else, even if the motive was only the fear of missing something worth having. The papers on vitamins D and E represent part of the work of preparation for a meeting of the international conference on vitamin standardisation which was planned for November, 1939, and never held. The advisability of substituting vitamin D_3 for vitamin D_2 as international standard of vitamin D was to have been discussed at the conference, and a comparison of the antirachitic potency of the two substances was therefore organised by Dr. K. H. COWARD and carried out in nine British laboratories. The result confirmed the exact equivalence at 40,000 IU per mg. of the two substances for combating rickets in rats. The section on vitamin E is perhaps the most important because it reports the experimental work undertaken to test the suitability of synthetic tocopheryl acetate for adoption as international standard of vitamin E, and goes on to announce its adoption and issue. To launch a new international standard in war-time is a noteworthy achievement. Great Britain is fortunate in having at her disposal nearly half the personnel of the International Conference and of being able to consult other members in America. With this substitute for the conference it has been possible to launch the standard provisionally in the anticipation that its position will be regularised when the postponed conference eventually meets. It is good that this bit of reconstruction has been tackled now and not shelved indefinitely.

BIRCH, BENCH AND EBULLIENCE

THOSE who have to do with young offenders are not unduly disturbed by the increase in delinquency which has been noted in this war as in others. At a conference convened last year by the Middlesex county council a committee was appointed to study factors responsible for the increase, and to advise upon them, and their report has now appeared.[1] Evacuation, lack of home discipline, absence of fathers on service and of mothers at work, broken homes from other causes, interrupted schooling, lack of occupations for leisure hours, high wages for those old enough to work, an unsettled excited state and a desire for adventure fed by stories of the exploits of fighting men are causes enough to provoke reckless behaviour even in a steady boy. The Home Office has estimated that delinquency in children under 14 was 41% greater in the first year of the war than in the previous year; in the 14–17 age-group the increase was 22%; but even so the great bulk of children never get into trouble: only 1 child in 90 appears in the courts as compared with 1 child in 120 before the war. Nor has evacuation meant all loss and no gain; in many country districts the villagers are taking pride in their foster children from the towns, and giving them good country standards of behaviour. Routine is a good steadier, and the committee would like to see school attendance better enforced; they also urge that since children can best acquire good standards of conduct if they receive sound religious instruction, the activities of the Sunday school should be widened. Education authorities, they think, should cooperate but not overlap with the probation officer; if both send visitors to the home of a child about to come before a court parents are apt to get the impression that a case has been prejudged before it is heard. Probation officers and school teachers should pool their knowledge; in Middlesex head teachers on a rota will attend the juvenile court, and they will be informed when a child in their school is placed on probation. The committee believe that remand homes should have blocks for observation, training and medical treatment, that there should be more accommodation in approved schools and a greater diversity of training there; and that the local authorities should be obliged to provide youth centres where all young people have the chance of joining clubs or other social organisations.

Younger magistrates, the committee suggest, should be more freely appointed to the petty sessional courts where they can get experience fitting them for juvenile court work. The committee do not believe in official birching—a view shared by Mrs. C. D. RACKHAM who, at a Eugenics Society luncheon on April 23, mentioned that there had been a tendency to revert to this discredited form of punishment. Most experienced magistrates, she said, had found that a boy punished in this way was nearly always back in the court again within a few weeks. She quoted the opinion of CYRIL BURT that birching nearly always makes the delinquent more furtive and more defiant. The commonest offences at present are thieving, and the sort of destructive behaviour that comes from too much energy with too little outlet; sexual and cruelty offences are few. The peak age of delinquency in boys seems to be 13. The juvenile courts, she pointed out, were capable of deciding whether a child had classified into four types. These are in order of frequency: those who fed all their children for nine months; those who weaned all their children early; those who fully breast-fed the earlier babies but weaned the later arrivals early; and those who weaned the first babies early but fed later ones for the full period. It may be that endocrine and anatomical (nipple) patterns determine which type of mother a woman is likely to become, but it is also possible that breast-feeding successfully may be a matter of habit. It is gratifying that type-1 mothers formed the largest of Dr Robinson's four groups (41% of the whole); the non-feeders came next with 24%. With all the advertising propaganda in favour of bottle feeding it is surprising that so many mothers persist in their good habits. Many waverers must have been adversely influenced by the recent advertisement in a national daily which proclaimed a certain dried milk as "The best foundation for life." So long as this is permitted the voices of those who advocate breast-feeding are crying in the wilderness. Dr Robinson's paper gives them something specific to cry about and one day perhaps they will be heard.

---

[3] Aldridge, A. G. V. *Arch. Dis. Childh.* 1941, 16, 182.

[1] Children who Stumble. Middlesex Guildhall, S.W.1.

OXIDATION AND ANÆSTHESIA

SEVERAL of the commonly used anæsthetics in their ordinarily effective concentrations reduce the oxygen consumption of tissues, that of nervous tissue being reduced relatively more than that of other active tissues such as liver and kidney. There are at least three ways in which they might do this: by acting on the outer layers of the cell so as to prevent oxygen diffusing in; by inhibiting the enzymes which carry on the intracellular oxidations; by breaking a chain of intracellular chemical reactions through combination with one of the reactants which form the "links" of that chain. During the last ten years Quastel and his colleagues[1] have provided much experimental evidence that when oxidation is depressed it is in the second of these ways. More recently, Johnson, Brown and Marsland[2] have demonstrated that drugs like ether, chloroform, alcohol or procaine cause bacterial luminescence to "go out," and it is well established by the work of Dubois and of Newton Harvey[3] that the continued luminosity of those bacteria depends on reactions which involve the consumption of oxygen. Johnson, and his co-workers have found that if the "anæsthetised" bacteria are subjected to oxygen under pressure they glow again, despite the presence of the anæsthetic. They made these observations however not only with whole bacteria but also with non-living preparations which had been extracted from the bacteria—presumably preparations of enzyme and substrate. Thus they seem to have provided some pretty evidence in favour of the second of the possible explanations for reduced oxygen consumption. The fact that this reduction occurs does not necessarily prove that these anæsthetics act primarily by diminishing oxidation, although undoubtedly anoxia can produce narcosis. Interrupting the cerebral circulation for 6–8 sec. results in loss of consciousness. Simpson and Derbyshire[4] have found that in the cat cerebral anæmia for 20 sec. abolishes the usual electrical activity of the cortex, and that anæmia lasting 2–15 min. often produces irreversible changes in the cortex and medulla. Undoubtedly, too, the effects of anoxia can augment those of narcotics—thus the weak anæsthetic action of nitrous oxide can be reinforced by anoxia. But narcosis can be produced without a decrease in intracellular oxidation. According to Bülow and Holmes[5] the oxygen consumption of minced brain is unaffected by nitrous oxide or acetylene. Using the fertilised eggs of the sea urchin, Loeb and Wasteneys[6] showed that when narcosis was produced by chloroform, chloral hydrate, ethyl urethane or various alcohols the oxygen consumption was depressed by less than 20%, and that greater changes of oxygen consumption, unaccompanied by narcosis, could be produced merely by altering the temperature of the eggs. Winterstein[7] found that an amount of alcohol which depressed the central nervous system resulted in increased oxidation. Even anaerobic organisms can be narcotised, and anaerobic intracellular chemical reactions can be slowed by the actions of anæsthetics on the enzymes which ordinarily maintain their speeds.[1] Warburg and Weisel[8] showed that the relative potencies of members of a series of urethane derivatives in inhibiting the anaerobic reproduction and fermentation of yeast were nearly the same as their potencies in depressing the oxygen consumption of certain bacteria (*Vibrio metschnikovi*). Winterstein found that ascaris, which does not need free oxygen, can be paralysed by ether or chloroform. Veszi[9] has demonstrated that obligate anaerobic bacteria can be narcotised. It seems, therefore, that depression of oxidation is not an essential part of narcosis.

1 Quastel, J. H. *Physiol. Rev.* 1939, 19, 135.—2 Johnson, F. H., Brown, D. E. S. and Marsland, D. A. *Science*, 1942, 95, 33.—3 Harvey, A. N. Nature of Animal Light. Philadelphia and London, 1919.—4 Simpson, H. N. and Derbyshire, A. J. *Amer. J. Physiol.* 1934, 109, 99.—5 Bülow, M. and Holmes, E. G. *Biochem. Z.* 1932, 245, 459.—6 Loeb, J. and Wasteneys, *J. biol. Chem.* 1913, 14, 517.—7 Winterstein, H. *Biochem. Z.* 1915, 70, 130.—8 Warburg, O. and Wiesel, R. *Pflüg. Arch. ges. Physiol.* 1912, 144, 465.—9 Veszi, *Ibid*, 1918, 170, 313.

RADIOGRAPHY AFTER AORTIC INJECTION

THE demonstration of solid organs by radiography is often uncertain, but if an opaque medium is injected into the arterial tree the organs are thrown up in sharp contrast to the muscular background. Striking pictures can then be obtained, revealing alterations in size, position or contour of kidneys, suprarenals or spleen. In vascular neoplasms of the suprarenals or kidneys pooling of the opaque medium in the blood sinuses is said to be pathognomonic. The details of the technique of aortic injection is described by O. A. Nelson.[10] He gives three important basic requirements for the production of a good picture. The opaque medium must be concentrated; the injection must be completed within a few seconds; and the film must be exposed the instant that the injection is completed. A high degree of technical skill and close coöperation between surgeon and radiographer are essential. Hand syringe injection is not quick or accurate enough, so the equipment includes a pressure apparatus for injection of the solution. Nelson uses an 80% solution of sodium iodide, of which 8–10 c.cm. is allowed to flow into the aorta. The X-ray machine, he says, should be able to deliver 500 milliamperes of current; and the Bucky diaphragm must be of the high-speed type, so that exposure can be made in ¼ sec. The patient receives 2 oz. of castor oil on the afternoon before the examination, and from that time is allowed only liquid nourishment. A preliminary film is taken to fix the position of the patient and make sure of the X-ray technique. The patient is anæsthetised with 'Pentothal Sodium.' He lies prone on the table, the left side of his back and chest is painted with iodine and the needle, about 12 cm. long and of 18 gauge, is passed into the aorta by inserting it from the back close to and a few c.cm. beyond the body of a lower thoracic vertebra. For arteriography of the organs of the upper abdomen the twelfth vertebra is the guide. The needle is passed through the skin below the last rib and three finger-breadths to the left of the spinous process. The needle encounters the bone and is then deviated slightly laterally to pass the vertebra. The stilet is removed and the needle passed on a few c.cm. Blood comes through the needle as the aorta is punctured. The needle is advanced another centimetre, the X-ray technician makes ready to expose the film, the pressure apparatus is attached, and the outlet valve is opened and 8–10 c.cm. of the sodium iodide solution allowed to flow in. This takes a few seconds only. The exposure is made just before the valve is closed. The pressure

---

10 *Surg. Gynec. Obstet.* 1942, 74, 655.

psychopath, voyeur, Peeping Tom," or when a foreman learned that one of his best labourers was feeble-minded, or when a college graduate was sent home with the label "mental deficiency imbecile" the situation was apt, as the annual report remarks, "to provoke something besides laughter."

This was partly overcome, however, by a circular letter from the surgeon general of the War Department, sent out in March, 1941, which brought diagnostic standards more into line. But at this stage before the liaison between Selective Service and the Army boards could become a working collaboration the proposal was put forward and has since been carried into effect that joint Army and Selective Service examinations should be arranged. The advancing interest in personality factors among doctors forming local boards must therefore have suffered a check, but this may well be counterbalanced by the convenience to recruits of a single in place of a dual examination, and by greater uniformity in psychiatric standards.

PROGNOSIS IN HEAD INJURIES

Pilcher and Angelucci[1] of Tennessee have analysed nearly 400 cases of acute head injury with special regard to the signs present during the first eight hours after injury. Their study demonstrates the difficulty of assessing the prognosis at this stage, for while many of the fatal cases had, for example, high temperature, abnormal respiration, compound fractures, pupillary abnormalities or severe paralysis these were also found in cases that recovered. Even a considerably raised systolic blood-pressure, a slow pulse-rate and a slow-respiratory rate were of little value in prognosis. Signs of cerebral compression, in fact, were of little clinical importance from the point of view of recovery whereas signs of shock were of much greater significance. Most of the deaths took place within 24 hours of the injury; if these are excluded they totalled only 5.4% of all patients. Intensive dehydration treatment was given in only 3.5% of cases so that the figures supply no evidence about its value. As Pilcher and Angelucci point out, the small mortality found in an unselected series such as this makes it very difficult to assess the value of any form of treatment. They also emphasise the impossibility of classifying head injuries clinically in terms of pathology and advise a classification according to the duration of disturbance of consciousness; this corresponds roughly to what is widely used in this country under the term "duration of post-traumatic amnesia." It is therefore rarely possible to give an accurate prognosis or diagnosis from a single examination in the early hours after head injury. This study did not include the clinical course of the individual case as indicated by changes in pulse, temperature, respiration, degree of consciousness and neurological signs, and, though a single record is of little value, repeated observations of these changes are essential in the management of head injuries if the dangerous complications are to be recognised in their early stages.

THE NORMAL ELECTROCARDIOGRAM

SINCE Lewis and Gilder's[2] original paper in 1912 there has been a steady stream of investigations of the normal electrocardiogram, most of which have shown a considerable degree of agreement. The present war, however, with its mass methods of medical examination has given an opportunity for reconsidering the normal in many branches of medicine. For the electrocardiogram the last word seems to have been said by Prof. G. E. Hall and his colleagues,[3] who have seized the magnificent opportunity of studying the electrocardiograms of the first 2000 men enlisted for air crew duty under the air-training plan in Canada. While only 27 of their records (1.35%) could be placed in the category which they describe as "textbook normal," the vast majority fell within the recognised limits of normality. They confirmed the finding of Chamberlain and Hay[4] that the upper limit of normality for the duration of the P–R interval must be placed slightly above 0.2 sec., for the Liverpool workers put it at 0.22 sec. Unfortunately the Canadian observers do not give a precise figure but they report that in lead 1 the P–R interval was greater than 0.2 sec. in 14 records, the corresponding figures for leads 2 and 3 being 31 and 38. They report a U wave 139 times in lead 1, 196 times in lead 2 and 16 times in lead 3. The discrepancy between these findings and those of Papp,[5] who reported that a U wave was present in 70% of normal records, is probably explained by Papp's observation that in only 5% of cases did it measure 0.5 mm. or more in height. Hall and his colleagues found 9 definitely abnormal records in their series, T_1 or T_2 being negative or bundle branch block being recorded. All their 2000 subjects had been passed as medically fit for flying. The 9 with abnormal records were carefully re-examined, as a result of which a few were found to have some degree of abnormality of the cardiovascular system; these men were not allowed to proceed with their training. The others were allowed to continue in spite of their abnormal electrocardiograms; it would be interesting to know how they stood up to the strain. Provided a correct sense of proportion is maintained the electrocardiograph can obviously be of great value in the detection of cardiac abnormalities, particularly in the case of Services, such as the RAF, where the highest possible standard of physical fitness must be maintained.

WHY BREAST-FEEDING FAILS

SOME years ago Dr. Margaret Robinson, studying the welfare-clinic records in Liverpool, found curious variations from year to year in the breast-feeding rate. She has now[6] returned to the problem with a more detailed analysis designed to study the cause of these variations. Preliminary classifications indicated that the position of the child in the family had no effect on the duration of breast-feeding and that the age of the mother did not appear to affect the feeding of the first child. The percentage who feed their babies for nine months was almost the same in mothers of 30–35 years (42%) as in the younger mothers (49% for the under twenties), thereby disposing of the "elderly primipara" myth. Further detailed analyses showed that the duration of breast feeding was not affected by the size of the breasts, the return of menstruation or certain ailments of the mother such as rheumatic heart disease, simple thyroid enlargement, or the occurrence during pregnancy of pre-eclamptic symptoms. On the other hand there appeared to be more failures in breast feeding among the "masculine" types and obese mothers, and severe degrees of morning sickness, pyelitis, breast abscesses and cracked nipple all played an adverse part in successful lactation. The size and character of the nipple, though not the size of the breasts, was of great importance in Dr. Robinson's group. Mothers with flat or small nipples were not good feeders but a baby could be successfully fed with a flat nipple provided that it was a "loose" one, in which when the baby chews with its gums on the outer edge of the areola the nipple is not retracted. This can be tested by squeezing the nipple with finger and thumb. With a loose nipple the digits come easily together and a squirt of milk comes out, whereas with a "tied" nipple a thick cord is felt. Tied nipples were very frequent among mothers with cracked nipples and breast abscesses—important causes of failing lactation. Dr. Robinson found that a series of 1000 mothers could be

---

[1] Pilcher, C. and Angelucci, R. War Med. 1942, 2, 114.

[2] Lewis, T. and Gilder, M. D. D. *Philos. Trans. Roy. Soc.* 1912, 202, 531.

[3] Hall, G. E., Stewart, C. B. and Manning, G. W. *Canad. med. Ass. J.* 1942, 46, 226.

[4] Chamberlain, E. N. and Hay, J. D. *Brit. Heart J.* 1939, 1, 105.

[5] Papp, C. *Ibid* 1940, 2, 9.

[6] *Arch. Dis. Childh.* 1942, 17, 23.

In England Now

A Running Commentary by Peripatetic Correspondents

OUR medical planning study group seems to be enjoying its deliberations, judging by the readiness with which we all turn up at our regular meetings or agree to the holding of extra ones. We are a nicely representative team ranging politically from our bright red chairman through innumerable shades of pink to one or two pretty true-blue die-hards. These last are (or were) quite prepared to regard everything as all for the best in the best of all possible medical worlds. ("Surely the best doctors get the biggest practices and so make the most money. What's the matter with that?") However they are now reading their pamphlets and seeing the light; they have even begun to make good and constructive suggestions. Harsh words are bandied across the table about state service with its passion for certificates and returns, its hierarchy of increasingly infallible authorities and its tendency to make its doctor-employee concentrate his energy on keeping on the right side of the man above him instead of devoting himself to his patients. Nevertheless, we have unanimously approved the principle of the health-centre—not necessarily state-controlled or financed it is true—and if that isn't progress I'd like to know what is. At present we are hammering out the several functions of the local and divisional health-centres. Some of us are vigorously opposed to the notion of periodic routine examinations of the apparently healthy which we think is conducive to neurosis and moreover quite unable to do what it sets out to do—to reassure the patient that he is quite physically healthy. All the resources of a hospital, we think, might still be inadequate to such a task. On the other hand, we have no objection to the patient, especially the adolescent or young adult, calling and having an informal chat with his doctor from time to time on how to keep as well as possible. But only if the patient wishes it; there must be no compulsion.

* * *

The last wire was cast off, a few fussy tugs pulled and pushed till we were in mid-stream and then we slipped quietly and rather sadly down river and away. As the low coastline receded I leaned on the rail and thought about the events of the previous few months. How one day last autumn we had put just as quietly into this United States port to refit our ship after many thousands of miles of war-time service at sea. It was the first visit for most of us and we thrilled with anticipation as we made our way slowly towards our berth. All along the river were evidences of the enormous industrial capacity of the country on a vaster scale than any to which we were accustomed. Huge chemical works, steel works in their massive grimness, and shipbuilding yards with new ships being built in groups of six or twelve and ship construction in progress on the first before the completion of the last—a very comforting sight. The initial hustle of the yard authorities was also impressive. No sooner had we berthed than officials swarmed on board to confer with us on the work to be done. Water, electric power, compressed air and telephones—not one phone but five—were quickly connected. It is true that our first impression of confident activity was tempered, as time went on, by realisation that the dockyard "matie" is the same everywhere—skilled and willing enough, but intensely jealous of his right to take time off, to indulge in protracted lunch periods and to lop off half an hour at each end of his working day either warming-up or clearing-up. The astronomical rates of pay of these workmen caused not a little comment from our penniless sailors whose working day was longer and at least as arduous. Still the work proceeded at a fair pace and we were given priority over certain United States vessels in the yard.

The yard itself was a revelation to those of us who were accustomed to the strictly utilitarian dockyards at home. It had blocks of large and airy shops divided by wide streets with trees and grass borders. There were canteens for the men, a recreation centre with clothing and other stores, a small cinema showing a different film each night, pool tables and bowls. There was also an officers' club inside the yard with dining and other facilities. This consideration for the well-being of the Service man struck me as being a fine thing. If we can combine efficiency and a degree of comfort for the men then let's do it; it is a policy which will pay dividends in the long run. If you put a man in uniform, reduce his income drastically, tax him heavily and increase the cost of living of his family, and then leave him to find his own amusements with what meagre funds remain in surroundings which even today are faintly hostile to a Service man you are sowing seeds of disaffection.

On our first "run ashore" we were struck by the frank interest of the passers-by in our uniforms, the tall clean buildings, the strict rectangular plan of the city—only possible where the main development has been comparatively recent—and the overwhelming hospitality of the civilians. The ratings couldn't walk about the streets for more than a few minutes without someone stopping them and inviting them home. There they were royally entertained and met more and more people who competed to entertain them in their turn, and these kind folk did not just invite the men to stiff dinner parties but took them into their homes and into their hearts. Once when I visited a sailor who was sick in a house ashore I was told by his hostess that her boy was away with the U.S. forces in the Pacific and so she had "adopted" our man; certainly nobody could have been kinder. The average sailor is a pretty shy chap but he bloomed in such surroundings, and from my duties as a censor officer I could tell that nearly everyone had a haven of this sort. The officers were made honorary members of nearly all the exclusive clubs in the city and suburbs (there was a weird class-consciousness which took some understanding) and were entertained to concerts, operas, society dinners and a host of other functions where many were asked to satisfy the American's love of after-dinner speaking. They had the option of wearing plain clothes and at times were almost obliged to exercise it continually so embarrassing was this spate of hospitality. It is even rumoured that one officer, when he entered a restaurant in uniform, was greeted by everyone rising and the orchestra playing "There'll always be an England." No restrictions were made on our movements, for no passports or other formalities were necessary and our identity cards passed us anywhere; all was made very easy.

The other doctor and myself were naturally interested in local medical affairs. We found a city of contrasts. There was an apparently acute public-health sense as evidenced by a low incidence of diphtheria—due partly to intelligent immunisation and partly to rigid quarantine rules—and cases of surgical tuberculosis were astonishingly few for a city of its size, largely I gather because of the efficient compulsory pasteurisation of milk. On the other side of the picture we find the appalling seasonal ravages of infantile paralysis, for which no-one can be reproached, a disturbingly high venereal-disease rate, a wealth of trauma, chiefly from automobile accidents which admittedly are more a sociological than a medical problem, and most striking of all, the rivers which flow through the city disgustingly polluted with uncontrolled industrial effluent and sewage. We arrived after a summer of drought and the stinking mud left bare by the falling water levels was a reproach to any community. The medical population were enthusiastic members of many learned societies to whose meetings we were often invited. A programme published each week gave details of all meetings of medical interest and the attendances at these meetings were remarkable for numbers and enthusiasm. We were received with great courtesy and our views, though far from authoritative, were given polite attention by these doctors many of whom were the cream of the U.S. profession. Hospitals and teaching centres were thrown open to us, we were begged to attend and give talks to small groups at various towns round about. Visits were arranged to the great clinics such as Cornell and Johns Hopkins.

The medical school of the local university afforded us an opportunity of drawing rough comparisons between our system and theirs. The medical course itself seemed much the same as ours except that less stress was laid on the minutiæ of human anatomy and more on experimental physiology and bacteriology. It was interesting to observe the effect of the compulsory three or four years of general college education before beginning medical studies proper. These college studies take the student to a standard which, I am told, is slightly lower than an average English BA or BSc, and the students start their apparatus is detached and a few c cm of blood allowed to run out The only complication Nelson has met is acute iodism in 4 of his patients The symptoms have not been severe but it is undoubtedly a disadvantage and Nelson is looking for a more satisfactory contrast medium. The less concentrated media so far tried have been too weak to give good pictures Injury to the aortic wall has not been a complication Twice extravasation of medium has occurred, but without evidence of necrosis On the whole, Nelson believes that untoward reaction and suffering are less frequent and less severe than after retrograde pyelography The information obtained, he says, may be even more definite in some cases than that got by surgical exploration Illustrations accompanying Nelson's paper show the use of the method in the diagnosis of a pancreatic cyst suspected of being a renal tumour, of a case of splenomegaly in which retrograde pyelography had suggested renal neoplasm, of a malignant tumour of the right suprarenal gland, of a cyst and a tumour of the kidney, of a case of hydronephrosis in which the opaque fluid injected for pyelography persistently returned into the bladder because the catheter could not pass the large cystic mass, and of a large renal calculus in which the arterial injection revealed a good blood-supply to the kidney cortex *Aortic puncture and injection of iodide is not to be lightly undertaken, but in the hands of the highly skilled it is clearly capable of yielding valuable results*

ADJUNCTS TO PERITONEOSCOPY

THE enthusiasts for peritoneoscopy have so far admitted that its value is limited by the inaccessibility of some parts of the abdominal cavity An instrument devised by Joseph E Hamilton overcomes some of the difficulties, and he has reported 31 cases in which he has used it[1] There were no accidents in these cases, and he is pleased with the added scope which it has allowed him The instrument—really two instruments in one—consists of a "manipulator" which is a blunt-tipped rod, and an insulated endothermy electrode Both fit into the sheath of a small paracentesis trocar through an air tight rubber nipple Either instrument can be inserted through a small stab wound, separate from that through which the peritoneoscope itself passes, and can be guided by direct vision through the peritoneoscope The rod is used to push impeding structures out of the line of vision, or to hook others into view The electrode divides adhesions and opens benign cysts The edge of the liver can, for example, be lifted up to uncover the gall bladder The fallopian tubes can be hooked from the depths of the pelvis by traction on the round ligaments, or the appendix raised for inspection Hamilton has used the peritoneoscope in 16 cases of gunshot wounds and stab wounds of the abdomen with the purpose of determining the extent of the penetration of the missile and the need for immediate laparotomy Prior to the use of the peritoneoscope it had been found that 12% of the abdominal operations undertaken in these cases had been unnecessary The suspected area of peritoneum is tented inwards and inspected Of the 16 cases, 7 revealed penetration and the remaining 9 none The latter were spared laparotomy, because the peritoneum was shown to be intact The differential diagnosis between acute cholecystitis and appendicitis has been made by direct vision in a doubtful case The appendix was hooked up by the manipulator and found to be normal, while the inflamed gall bladder was plainly seen Salpingitis can also be revealed, and laparotomy for a mistaken diagnosis of pelvic appendicitis avoided Hamilton finds that peritoneoscopy can determine definitely whether the spleen or liver is ruptured but that negative findings in a suspected case of rupture or perforation of the bowel are not conclusive On two occasions attempts were made with the electrode to rupture small follicular cysts of the ovary, which by endocrine stimulation were producing severe menorrhagia In one case the cyst was plainly seen and ruptured, with temporary relief of symptoms One successful lysis of adhesions is reported This was in a negress aged 44 with persistent pain beneath the right breast of almost incapacitating severity All radiographic investigations had drawn a blank Violin-string adhesions between the liver and anterior abdominal wall were seen by peritoneoscopy Tugging on these produced the same "sticking" pain of which the patient had complained The adhesions were divided under direct vision and the pain is said to have almost gone Hamilton's technique, if proved safe, seems likely to extend the scope of peritoneoscopy

---

[1] *Surg Gynec Obstet* 1942, 74, 505

ŒSTRONE AND ANTIBODIES

Von Haam and Rosenfeld[1] have studied the effect of œstrone injections on the rate of antibody formation in rabbits For their antigen they used type 1 pneumococcus which had been passed through mice to increase its virulence before the vaccine was prepared The immunisation was by the "four week complete system"[2] in which the vaccine is injected intravenously in increasing doses for four successive days and the process repeated four times during four weeks When œstrone was injected throughout the period of immunisation the concentrations of specific agglutinins and of protecting antibodies in the serums were much higher than they were in control rabbits, also the rise in concentration in the experimental animals preceded that in the controls and lasted longer These results were obtained by the injection of 1 mg of œstrone into each rabbit every other day This dose is, of course, high If we assume that the dose necessary to sensitise the uterus of the female rabbit to the action of progesterone produces a physiological œstrogen concentration in the body, the dose used in these experiments is at least 50 times greater This may not be important In one experiment it was shown that a second exactly similar immunisation further increased the antibody content of the serum—but relatively more so in the controls than in the experimental rabbits This suggests that the dose of œstrone employed was maximal The experiments were carried out on both normal and castrated males and females and the response of the castrated animals appeared to be greater than that of the normals the numbers, however, are insufficient to make this observation more than suggestive At present there is no evidence as to the mode of action of the œstrogens in this connexion and Von Haam and Rosenfeld are careful to point out that the observation on rabbits should not be generalised to include other species But the facts do fit in nicely with the increase in natural and acquired antibodies which has been observed during pregnancy[3] This increase is highest in the latter part of pregnancy when the concentration of œstrogen in also highest Whether this action of œstrone will prove to have therapeutic value or physiological significance remains to be seen

---

1 Von Haam, E and Rosenfeld, I *J Immunol* 1942, 43 109
2 Goodner, K , Horsfall, F L and Dubos, R J *Ibid*, 1937, 33, 279
3 Aycock, W L and Kramer, S O *J exp Med* 1930, 52 457
Hudson N P , Cook, E A and Adair, F L *J infect Dis* 1936, 59, 60

GASEOUS ANÆSTHETIC APPARATUS —Mr A Charles King, who is known to anæsthetists as a progressive manufacturer of their apparatus, has produced a helpful handbook (London Baillière, Tindall and Cox Pp 48) on the care and use of anæsthetic equipment Line drawings show how the various types of reducing valves and flowmeters work and clarify the chief features of the different forms of apparatus This book answers many of the questions which crop up in the induction room “it will be necessary to design a hospital service in areas substantially larger than those of individual local authorities.” Neither Mr Brown nor any of the speakers in the debate drew attention to the singularly patchy nature of our hospital accommodation thick around London and Birmingham for example tenuous in Devon and Cornwall and many other county areas.

The Ministry of Health has now under weigh a small network of surveys of parts of the problem of hospital reorganisation. Those in London are being surveyed, those in Lancashire, Cheshire and North Wales are to be surveyed. And in addition such problems as the organisation of the teaching hospital are being attacked. Mr Brown concluded by saying that he did not wish to make “categorical decisions” in advance of the assembly of the evidence “and the debate showed the need for careful regionalisation of the surveys and for the amassing of detailed information. For the work of the medical man is harder than that of the statesman, the soldier, or the lawyer, said Mr Brown, since he has “to pit his intelligence against nature, and nature can be a very stern judge.”

FROM THE PRESS GALLERY

Future of Hospital Services

IN the House of Commons on April 21, Mr HECTOR McNEIL, the young Labour member for Greenock, spoke on the future of hospital administration. He moved an amendment to the civil estimates emphasising the need for regional planning of our hospital services and expressing the opinion that the utmost efficiency with maintenance of democratic control can only be secured by full recognition of the status and responsibilities of local authorities and that, especially in areas already amply served, independent schemes for the future building of hospitals should be discouraged as being inimical to a coördinated post-war plan. After the war, he went on, we had the right to expect a better hospital service, for with a falling birth-rate no immediate extension would be called for. Our present system had been largely determined by the pace of the horsed ambulance, but with the air ambulance geographic limitations disappeared and it would be easier to plan on a progressive scale. The Services would provide a reservoir of young professional men with administrative experience but Mr McNeil was glad to say, almost penniless, for he hoped this combination of circumstances would force the state to sweep away the pernicious system of buying practices. The Services would also provide nurses if we could afford to offer them attractive conditions. Because nursing was a vocational profession that was no excuse for imposing on its members arduous and tedious duties under a discipline which children would not tolerate. But Mr McNeil found the main reason for his hopes in the development of the Emergency Medical Service. Over 80% of all the hospitals in England and Wales were now inside the scheme and there had been a steady extension of the classes of patients eligible for admission. Mr McNeil hoped that the remaining artificial divisions between different categories of patients would in time be swept away and the EMS put at the disposal of the whole community. Within the EMS the old conception of a general hospital had given way to a pattern of specialist hospitals and Parliament must take care that at the end of the war the buildings and equipment of this service were not dissipated.

THREE SOPS AND A GAUNTLET

Before stirring up possible disagreements Mr McNeil offered the House three assumptions which he thought they would readily accept. Good health can be bought and costs less than ill health, but we must be prepared to pay a higher price for it than we have done hitherto. On the curative side of medicine no single factor was more important than the hospital service, yet at present ours was inadequate. Today, for instance, we had not enough beds to cope with the increase in tuberculosis or cerebrospinal fever. The weapon to tackle these deficiencies was regionalisation. But apart from these three points he feared there would be much disagreement. What, he asked, was to be the size of the region, how would it be administered, how should it be financed and what would be the pattern of the scheme? Apart from the LCC he felt there was no local authority suitable for this type of administration so local authorities—like other less vocal organisations—must be made to cooperate. He suggested that the Minister should remember that the EMS unit had proved its worth. The unit had been designed to meet bombing, but disease like bombs tended to hit the country heaviest where the population is most dense. Later with the reallocation of industry and population they could be reconsidered, but for the present existing boundaries would probably be acceptable, provided there was devolution in administration. In the peace-time design of the scheme the administrative officer should be the public-health officer, for under exemplary conditions hospital service is a handmaiden to public health service. The supreme point of disagreement was the function of voluntary hospitals within any regional scheme, and for his part Mr McNeil boldly asserted that there could be no autonomy for them if the utmost efficiency in the area was to be secured. The large voluntary hospitals were not typical and many small-town ones carried on a desperate struggle against severe limitations, not always with very happy results. The city voluntary hospitals were the stars of the hospital world. The Cinderellas were the public-assistance and local-authority hospitals which carried on the tedious drudgery of caring for the aged and the infirm, the chronic sick and the casualties of our industrial battlefield to whom the voluntary hospitals could not open their doors. [Mr MESSER interjected “would not” but Mr McNEIL persisted.] The voluntary hospitals had performed a great service when there was no other institution to do the work, but he did not think that was necessarily any longer true and the long waiting-list was a grave drawback to the system. He hoped that the Minister of Health would remove the impression which he had created in various parts of the country that he intended to treat the voluntary hospitals preferentially.

With adequate health centres, an efficient educational health scheme and industrial medical officers Mr McNeil believed we could ensure that disease would be quickly detected in all sections of the community. Even in normal times he expected there would be an increase in casualties as the industrial pace quickened and rehabilitation hospitals should be fitted into the pattern of the areas. He thought that an area committee would not function with maximum efficiency merely with advisory powers. It must be an executive body, composed mainly of local government members, but on which all other medical interests of the area would be represented. The Government had said they meant to maintain the principle that the patient paid according to his ability. Most people expected that National Health Insurance would be extended to cover wives and dependants. Mr McNeil hoped it would be stretched a little farther to include a statutory contribution for hospital service, for the working man was willing to pay for a service which was necessary to his family. People are eager to know what instalment of social justice they may look for at the end of the war and Mr McNeil invited the Minister by defining his intentions for the hospitals to give them heart for the long tedious jobs they must undertake today.

MEMBERS AND MINISTER REPLY

Mr D FRANKEL who seconded the amendment was anxious that the Minister should take powers to prevent new hospitals being built without his sanction. The chairman of Charing Cross, at a luncheon at which Mr Brown was present, had already announced the purchase of a new site in St Giles High Street, W C 2, in close proximity to at least four other large teaching hospitals. This did not seem to be in accordance with regional planning.—Mr S STOREY affirmed that whatever our ultimate hospital service may be it should be built up from existing organisations. Through the EMS and the Nuffield Trust our two hospital systems were learning to know each other. He pointed out that what had already been done in the way of coördination had been achieved by advisory and not by executive bodies. He thought the best results would be obtained by bodies with only such executive powers as their constituent members unanimously granted them. But he would give the Minister an overriding authority to take action if need be.—Mr F MESSER thought the medical studies at about 21, the age of graduation thus averaging 26–27. I gained the impression that the senior students and junior residents with whom I spoke were more men of the world, were able to converse more easily and had more outside interests than the average graduate from our universities. This self-confidence is no doubt enhanced by the frequent "seminars," at which the clinical clerk or dresser demonstrates his cases before a lecture theatre full of his contemporaries, and must answer a barrage of questions and comment. Curiously enough these same residents seem to be given a minimum of responsibility and even less opportunity to "try their hands." This is largely due to the numbers of clinical assistants and fellows who are always present and who take a large share of the minor work.

The hospitals impressed us enormously. Usually they were vast buildings run rather like chain-stores, with plenty of excellent equipment. The staffs were much larger than in our hospitals and were swollen by the clinical assistants already mentioned. Everything was very clean, very new and very thorough and gave an impression of comfortable affluence which seemed to me to be strangely foreign to a hospital, so miserably poor were the ones in which I had my training. The huge city hospital, though not quite so modern or lavish, did the bulk of the routine work and more than its share of the chronic cases, like the municipal hospitals do at home. The lot of the student nurse does not seem quite so hard as over here; her wages are better and she is not treated as a potentially naughty schoolgirl both on and off duty. In all these hospitals, and in the new naval hospital in particular, we were bombarded with probing, intelligent questions about the war and our professional experiences. The American wants above all to know what is going on and to prepare for eventualities in the *n*th degree.

It was interesting to observe the changes brought about by the Pearl Harbour disaster. Before then, in spite of a great bias in favour of the Allies, most Americans showed the appalling complacency which was once so apparent in England and which even now is seen at times. Many intelligent people, civilians and Service men, assured me before Dec. 7, 1941, that Japan was a loud-mouthed nonentity, that her warships and military planes were antique musical-comedy relics, and that her ideas of modern warfare were laughable. I was repeatedly told that, at a liberal estimate, Japan might last a few months in a war with the United States. I was proud of the opportunity of seeing a new America arise after Pearl Harbour, an America that was not afraid to impose drastic restrictions on labour and consumption from the outset, an America so full of possibilities that President Roosevelt's production ideals are no idle dream; above all, an America which is now "in it" and prepared to act.

I brought back a jumble of other impressions—of the incredibly beautiful tints of an American autumn; of telephone efficiency and courtesy; of a land abounding with dairy produce, fruit and greenstuffs, and making good use of them; of overheated buildings and public vehicles; of enlisted men driving their private cars in and out of barracks; of innumerable cafes and "diners" in all of which the food and fittings were scrupulously clean and speed of service was a major consideration; of bars and saloons open till all hours, and yet surprisingly little drunkenness on the streets; of the precocity of the children, particularly the girls who seem to be allowed a free hand from early adolescence; of patching up the few sailors who indulged in the inevitable fights when alcohol had increased their patriotism and natural belligerency while lowering their discrimination. No wonder we were sorry to go.

* * *

Now that Davis and I send out several thousand postcards every week we are getting to know where people live. You'd be surprised how many reside at Cosycot, Kosy Kot or Kosikot, and how many have at last found peace at Dunroamin, Dunlukyn or Dunrovin. (Davis maintains that the clergyman who lately changed his address to Dunluce was also breaking with his past.) Perhaps, gentle reader, you are yourself the householder to whom we write at Thyslldu, Hearamai, or Ersanmine? But I prefer to think of you, lyrically happy, at Harts Delyte (sic). Ovayonda is also romantic, but a bit on the gynæcological side.

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS M.P.

THE future hospital organisation of the country came under review last week in the House in the form of a debate on a supply vote for the Ministry of Health. The debate was initiated by Mr McNeil, whose luck in the ballot for motions enabled him to table a comprehensive amendment. This amendment stressed the need for regional planning of hospital services and a recognition of the status and responsibilities of local authorities, and laid it down that independent schemes for the future building of hospitals should be discouraged as being inimical to a proper coordinated post-war plan. One point Mr McNeil made was that the falling birth-rate should enable us to have a better hospital service after the war because of the decreasing numbers with which future services will have to deal. And he asked the House to get away from the ideas of the horse-ambulance of the past to the aeroplane ambulance service of the future, with which experiments have already been made in the Highlands and Islands of Scotland. Mr McNeil said that the main reason for hope in the future "rests in the development of the Emergency Medical Service." Mr Thomas Johnston, Secretary of State for Scotland, spoke of EMS hospitals in Scotland becoming "the nucleus of a great service, perhaps the backbone of a great organisation for a united attack on physical suffering" in the future, and this was quoted with approval with the addendum that the Minister of Health has "demonstrated" by his practice that it is also his hope.

This contention and this appraisement of the position of the EMS hospitals was not fully accepted by the House and there is indeed a difference in this respect between England and Wales and Scotland. But the EMS organisation has made its mark and much of it will be incorporated in the hospital system of the future. Nowadays few, if any, argue for the status quo in the hospital world. Indeed the status quo has been abolished beyond the possibility of reinstitution by developments since September, 1939. What Mr McNeil had in mind was an extension of National Health Insurance to cover wife and dependants plus a statutory contribution to provide for hospital services up to the £420 income limit and beyond.

Mr Messer, whose extensive experience of hospital administration in Middlesex entitles his views to careful examination, wished to enlarge Mr McNeil's conception and said we should aim at a national health services standard. Provision of hospital accommodation and treatment should be designed strictly in regard to "the potential patient." The complexity of the various services was stressed by Mr Messer, as well as the fact that out of 560,000 beds only 150,000 are in voluntary institutions. There should be no rivalry between municipal and voluntary hospitals, and there should be beds for all who are sick. Sir Francis Fremantle strongly endorsed Mr Messer's plea and said that voluntary and municipal hospitals should be "cemented together," and that he would be very glad if municipal hospitals were teaching hospitals. But we must not have "a cut-and-dried" system laid down for the whole country.

The debate strayed several times towards the wider fields of general health services and Mr Ernest Brown intervened at one point to say that he understood a whole day was to be devoted later on to these bigger issues. In winding up he returned to this point when he deferred his answer to some of the general questions—one was that of factory medical services—to that later debate. Mr Brown said he could not now make an immediate decision on hospitals of, say, what was to be "the shape of things to come," but he could point out what was being done to get the results. It will be remembered that the Minister of Health made a statement on the hospital policy of the government last autumn. What we had to work for now was "a true partnership between local authority and voluntary hospital." The EMS scheme would not be destroyed in the post-war world. It had many lessons for the future. Regionalism on the pattern of civil-defence regions the Minister put on one side, but the ministry and the appellant —Sir A Knox How many doctors are required ?—Sir W Womersley I could not say without notice

Shortening Medical Training

Sir E Graham Little asked the Minister of Health whether he was aware that certain officers on the Central Medical War Committee are exercising pressure upon the medical licensing bodies to shorten the period of training of medical students in their final years, in one instance by a sixth, owing to the scarcity of medical officers in the fighting Services, and that such measures injure the reputation of licensing bodies , whether any of the proposals for redistribution of medical man power, detailed in the circular no 2624, have been operated , and what are the prospects of so redistributing personnel as to meet the immediate demands both of the Services and of the civilian population without curtailing medical training ?—Mr Brown I am not aware of any pressure of this kind having been exercised by officers of the CMWC on medical and licensing bodies Since circular no 2624 was issued on April 9 it is obvious that sufficient time has not elapsed for the measures recommended to have been fully brought into operation I am informed by the Medical Personnel (Priority) Committee that in their view both redistribution of medical personnel and some curtailment of the period of medical training are necessary

Additional NHI Benefits

Mr C T Culverwell asked the Minister of Health if, in view of the fact that some approved societies had no surplus funds available to provide additional benefits, such as ophthalmic or dental treatment, he would issue instructions that prospective members should be informed of the extent of the benefits which the society was in a position to provide —Mr Brown replied I have no power to require an approved society to inform a prospective member of the additional benefits, if any, which it is for the time being able to provide A person cannot become entitled to such benefits until he has been a member of his society for the minimum periods laid down in the regulations and in the meantime a quinquennial valuation of the society's funds may have led to a material enlargement or contraction of the additional benefit rights conferred on its members Information as to a society's current scheme of additional benefits or as to its present inability to provide such benefits may, therefore, prove misleading as a *guide to probable future rights* —Mr K Lindsay Does my right hon friend realise that this means that boys of 14–18 cannot get any dental benefit to supplement the regular attention to their teeth in school for the previous three or four years ?—Mr Brown This is a matter of the act and the regulations under the act

Soldier's Death in Hospital

Mr F Marshall asked the Secretary of State for War if he would cause a thorough investigation to be made into the circumstances surrounding the death of the late Private H Matchett, which took place at Pinder Fields Emergency Hospital on Oct 3, 1941, six months and eight days after an operation for hernia carried out under a spinal anæsthetic , and why it was necessary to issue two death certificates, one stating that the cause of death was pyelonephritis, myelitis and toxæmia, due to bedsores, and the other, after a coroner's inquest, giving the cause of death as disease of the spinal cord and paraplegia, and stating that these conditions were due to 'Percaine' anæsthetic given for operation of left inguinal hernia —Mr Brown replied This case has already been fully investigated through a coroner s inquest I have obtained reports of the facts and I am advised that further investigation would not be warranted There were two death certificates because one was issued by the hospital, before the coroner directed the inquest, and the second was issued later to register the cause of death determined at the inquest The two certificates are not inconsistent

Approved Schools and Remand Homes

Mr Herbert Morrison, Home Secretary informed Mr Edmund Harvey that at the end of March about 1100 boys and girls were awaiting vacancies in approved schools , but he hoped that before long this waiting list would be reduced to more normal proportions, when the 16 new schools now in progress were completed Requisitioning powers would be exercised if necessary New accommodation for remand homes was to be provided at 20 places, and this, with the improvement in approved school accommodation, would bring about a more satisfactory position

Letters to the Editor

HOME GUARD CASUALTIES

Sir,—Criticism of high authorities is wisely restricted in times of national emergency, but it remains true that adequate publicity is still a most powerful and useful weapon in our armoury Someone (usually the editor) has to choose between merely destructive and spiteful criticism and essential commentary for which official channels provide no outlet I am hoping that you may esteem this letter to fall into the latter class It deals with the medical service of the Home Guard which has recently passed into a state of indecision which may prove most disastrous in case of invasion

The organisation of this service is governed by various official instructions and letters which are technically of a secret character, but they included the following words which can hardly prejudice our success however widely they are known "Since the Home Guard has no wheeled transport, its responsibility for moving Home Guard casualties must normally end at a point beyond which they can no longer be conveyed in hand-borne stretchers" This instruction has now been cancelled and we find a much heavier responsibility laid on us—"Home Guard casualties will normally be evacuated from Home Guard casualty collecting posts by ambulance transport of the Civil Defence casualty organisation Where this cannot be made available local Home Guard arrangements must be made" That these "arrangements" are to include evacuation beyond casualty collecting posts is further emphasised by the declared duty of Home Guard medical officers to "make arrangements for the evacuation of casualties," and by the further statement that the responsibility of the Civil Defence services does not begin until Home Guard casualties "have reached" those services

To put the matter shortly, our old obligation to collect our casualties at collecting points, and to retain them there until the civil services could clear them, is replaced by an obligation to make arrangements for evacuating them from such posts to (presumably) the nearest posts of the Civil Defence services, which may be several miles distant And we are to do this although we still have no transport available for the purpose We are not told how we are to effect this evacuation although certain vague suggestions have been made of the use of handcarts, farm wagons and the like Nor is it clear whether civilian casualties which happen to be brought to Home Guard posts are also to share the perils of improvised evacuation

That we should arrange to retain our casualties in as much comfort as we can until ambulances can come for them is reasonable, and within our powers This new order to arrange for their evacuation is surely an undesirable and almost impossible alternative Perhaps publicity may procure that clarification of the situation which is not available from official sources

Hereward

ECONOMY IN QUININE

Sir,—In reply to a question in the House of Commons (see *Lancet* April 4, p 431) Sir Andrew Duncan stated that supplies of quinine are adequate for a considerable period Nevertheless it is important that its use should be restricted as far as possible After using quinine in malaria therapy now for nearly twenty years we are prompted to give some advice as a result of our experience It is not generally recognised that the amount of quinine necessary to cure an attack of malaria varies according to the species of parasite involved , hence the importance of first establishing a diagnosis

In *P vivax* infections a single dose of quinine gr 5 will abort an attack and gr 5 once a day for 15 days will effect a cure Larger daily doses, even if extended over a longer period, do not prevent relapses, and this applies whether the patient has been infected by the bite of one mosquito on one occasion or by 100 infected mosquitoes daily for a week So much for primary infections in relapses an even smaller daily dose for a few days is sufficient This is our experience with more than six strains of *P vivax*

Infections of *P falciparum* require a larger dose , we have found gr 10 daily for ten days sufficient Long delayed relapses or latency are not seen in malignant tertian malaria trouble was not that we had two hospital systems but that we did not have one at all We had two types of hospital, but the voluntary hospitals were separate units and out of 66 county councils only 25 had appropriated their public-assistance institutions He urged that we should aim at a national standard in our health services We provided a school place for every child and we should be able to provide a hospital bed for every potential patient —In considering finance Sir Francis Fremantle thought the University Grants Committee would serve as a valuable precedent A similar body should be given responsibility for the distribution of the money provided by the Government for a hospital system —Mr C G Ammon felt that something might be done to give direction rather than rebuff to philanthropy

Mr Graham White found the debate unreal, for he thought it impossible to consider hospitals apart from the general subject of medical services, but Mr E Brown began his reply by explaining that later a full day was to be given to the health of the nation He thanked Mr McNeil warmly for his speech but said he would not attempt to define the size of a region until facts had been assembled Surveys were at present being made, and he took no responsibility for the announcement of Charing Cross Hospital's new site He admitted that more beds were needed for the treatment of tuberculous patients but said the real difficulty was not so much beds as nursing and domestic staff A number of machines for mass radiology had been ordered from America and specifications had been drawn up for the manufacture of others in this country He promised that the EMS would not be destroyed in the post-war world but fitted into the general scheme Indeed we had much to learn from it—the grouping of special treatment centres with facilities for inter-hospital transfer of patients, country branches and auxiliary hospitals for the convalescent, and inexpensive hospital construction Before the war it was reckoned that a hospital cost £1000 a bed In a war-time single-storey hospital the figure was about £250 We might hope to have a sound and reasonable long-term type of construction somewhere between the two In his statement of Government policy last autumn Mr Brown had avoided the use of the word region—which seemed to carry unfortunate local-government and civil-defence associations—but he agreed with Mr McNeil that a corporate hospital service must be designed in areas substantially larger than those of individual local authorities He would aim to avoid overlapping by arranging for a proper division of functions between the hospitals in the areas It would be uneconomic to try to provide hospital treatment town by town or even county by county The Government also agreed with the amendment in wishing to recognise the status and responsibilities of local authorities. They intended to impose on the larger councils the duty of securing the provision of a complete hospital service In discharging this duty the councils would no doubt look for help to the voluntary hospitals The Government envisaged the continuance of a more ordered and regular partnership between the voluntary and municipal hospitals A committee had been appointed to tackle Scottish problems, a survey was being made of the hospitals of London, and at the request of influential bodies representing municipal and voluntary hospitals in Lancashire, Cheshire and North Wales he proposed to institute a survey covering the territory centred on the teaching hospitals of Liverpool and Manchester Another committee had been set up to consider the general organisation of all teaching hospitals With so much in train Mr Brown felt it was wise not to make categorical decisions in advance of the assembly of evidence

Money to Burn

In the debate on the new tobacco tax in the report stage of the budget resolutions on April 22 appeals were made to the Chancellor for leniency, but Sir Francis Fremantle suggested that if the additional tax was supposed to reduce consumption it should rather be extended to men and women in the Services Sir Maurice Cassidy had written to the *Times* affirming that serious injury was being caused by excessive smoking in the Services, and another distinguished physician had told Sir Francis that he agreed that serious gastric troubles were the direct result of heavy cigarette-smoking among the Forces But the proposal found little response Mr J Ritson, who was appealing on behalf of old-age pensioners, assured Sir Francis that they were as immune from the attacks of tobacco as the pipes they smoked, and Lieut -Colonel A V G Dower declared that with all due respect to medical opinion the benefit derived from a reduction of smoking in the Forces would not make up for the unhappiness it would cause. The men were separated from their homes and families, to limit their tobacco as well, in his opinion, was carrying austerity too far If we wanted to save tobacco, why not begin with cigarette ends? Mr David Adams pointed out that those who indulge in heavy smoking and suffer in consequence seem to think it was worth while Sir Kingsley Wood with sympathy but firmness refused any further concessions, and when pressed by Sir Francis for his reactions to the medical side of the question replied " I always hesitate to make an observation on medical opinion I was minister of health for a good many years, and I was sometimes bewildered by the advice and opinions I received from medical authorities "

QUESTION TIME

The Birth-rate

Mr Ivor Thomas asked the Minister of Health whether it was the intention of the Government to encourage an increase in the birth rate at the present time —Mr E Brown replied It has been the policy of successive governments, in fields much wider than that of my department, to influence the national life and economy in favour of families with children The income tax allowances for children, the arrangements for the care of mothers and young children, the provision of free education and of school meals and school medical services, and the preference given to large families in the selection of tenants of municipal houses afford familiar examples This policy has been extended by many war measures such as increased allowances for children under the Unemployment Insurance and Assistance Schemes and for children of members of the Forces, Exchequer subventions towards the cost of bread and other staple foods, the extension of the school meals service and the provision on an increasing scale of cheap or free milk and other protective foods for expectant mothers and young children Moreover, children's clothing has been excluded from the scope of the Purchase Tax These measures carry with them a very substantial relief from the financial burden of parentage

Population Statistics

Petty Officer Alan Herbert asked the Minister what information had been obtained from the inquiries made under the Regulations (Statistics) Act, 1938 —Mr Brown replied Part II of the Registrar General's Statistical Review for 1938, which contains a report on the material obtained in 1938 under the Population Statistics Act of that year is with the printer and should be available by the end of the present week With a view however to economy in the consumption of paper it has been decided to limit the issue in the first instance to a small number of copies which will be held by the Registrar General and made available for consultation and study by Government departments and other bodies or persons having an acknowledged interest in its contents

Doctors for Pension Appeal Tribunals

Sir Ian Fraser asked the Minister of Pensions whether he had asked the Ministry of Health for doctors for pension appeal tribunals, and, if so, what was their answer —Sir W Womersley replied I have been informed that the necessary number of doctors could not be supplied at the present time

Sir I Fraser Has Sir W Womersley represented to the Ministry that there may be a considerable number of older doctors who served in the last war, and who could undertake this work?—Sir W Womersley A thorough investigation into the medical personnel available in the country was made by a special committee who reported that the medical men were not available

Mr S S Silverman Does the Minister consider it really necessary to have a doctor on such an appeal tribunal? Would it not be sufficient to have any mind trained in the weighing of evidence to consider the medical evidence already existing?—Sir W Womersley It is not just a question of having a medical man on the tribunal He has to assist both months ago 1 c cm to 2 c cm Only one attack in last 10 weeks

2 Female with occasional severe attacks and intermediate headaches After 5 doses, headaches vanished, replaced by a general feeling of well being Attacks now only once in 3 months

From these results I conclude that there is a definite allergic factor in some cases of migraine, especially as in both cases attacks were worse after the eating of meat I intend to try Dr Leyton's method in my next case

Llandudno **BENJAMIN MUSHIN**

VITAMINS IN OPHTHALMOLOGY

SIR —In your annotation of April 11 you state that in tobacco amblyopia I have incriminated lack of vitamin B_1 No such statement was made by me In the paper concerned (*Brit J Ophthal* 1941 25, 556) I described a case of retrobulbar neuritis and peripheral neuritis in a chronic alcoholic and pipe smoker His diet was greatly deficient in vitamin B_1 and he had complete achlorhydria Although he continued to smoke he improved rapidly by giving him a mixed diet 'Bemax' and vitamin B_1 intramuscularly and stopping his alcohol I also reviewed the literature showing the association of retrobulbar neuritis with beri-beri, pellagra, chronic alcoholism, pregnancy and diabetes mellitus An analogy to peripheral neuritis was thus noted which is now generally recognised to be due to vitamin-B_1 deficiency in the aforementioned conditions Its association with pellagra suggests a mixed deficiency of B_1 as well as of nicotinic acid I concluded that all cases of bilateral retrobulbar neuritis should be investigated as to the vitamin-B content in the diet, particularly if associated with beri-beri, pellagra or peripheral neuritis, and treated accordingly.

There appears to be no doubt that tobacco does cause retrobulbar neuritis but in some of these cases it is possible that nutritional deficiency—i e , hypovitaminosis B_1—is an added factor and this would have to be corrected I certainly believe that tobacco alone as a toxic factor is able to produce this lesion The pathological lesion in tobacco amblyopia is indistinguishable from that found in hypovitaminosis B_1, and it would thus be preferable to use the term retrobulbar neuritis and determine the causal agent, whether tobacco, nutritional deficiency, sphenoidal sinusitis, disseminated sclerosis, &c

In beri-beri—cranial nerve lesions, especially of the 6th and 8th nerves, have been described as well as optic nerve degeneration In these days when nutritional deficiency may become possible it would be well to bear in mind that loss of vision is one of its symptoms

Highgate Hospital **B GOTTLIEB**

STUDENTS' CALL-UP

SIR,—It seems a little unfair that the de-reservation of unsuccessful examinees should be at the discretion of the individual deans of the medical schools There is almost certainly a wide diversity of opinion amongst the deans on this question Would it not be possible and fairer to form a committee of responsible persons before which the delinquents could appear and be given a chance to explain their failures ?

Another point is the difference between the various exams The London finals take 3 years to complete, Cambridge 2¾ years and the Conjoint only 2½ years The last is held every three months, whereas the first two are held only twice yearly Some students, in an endeavour to serve their country, are making the conjoint their primary aim, in order to qualify as soon as possible , others hold back, either not taking the conjoint at all or not completing it until they have had a chance to take their university degree At the moment this applies more especially to the London students, but with the reduction in the conjoint qualifying time to 2½ years will apply to all What action is to be taken against students failing in conjoint exams who fail because they sit at the earliest possible moment ? And what action is to be taken against those who deliberately delay qualifying by conjoint in order to sit for their university degree ? Are the former to be penalised and the latter to be commended ? And remember that failure in the conjoint means only a three months' delay whereas failure in a university degree means a further six months before qualifying The remedy seems to be in either making all students take the conjoint exams (an expense, no doubt) or in allowing those who do qualify early by conjoint the time to complete their university degree

At present newly qualified men are allowed a six months' house-job before being called up Would it not be possible for this house-job to consist of three months as an HP and three as an HS ? And is it not time that steps were taken to stop the pernicious system whereby those who can grab a B1 or B2 job are allowed further time before being called up ? Such a system does not induce young men to join the forces when their less patriotic brethren remain behind in comfortable and interesting jobs and have the chance of studying for higher degrees Under the present system I shall probably do my utmost also to grab a B job

London **REX FENDALL**

ANTISEPTIC EMULSIONS

SIR,—We thank Mr Coutts for his letter of April 11 Two typographical errors in our paper of March 21 have been overlooked—the first and the last of the formulæ for emulsions (p 349) are O/W emulsions and not W/O emulsions since Lanette Wax SX is the emulsifying agent present Emulsions with cera alba as the emulgent (W/O) were too stable for our requirements, those with lanette wax SX (O/W) were varied with the several amounts of oil, water and wax used Our original basic emulsions of required *instability* was of the W/O type using cera alba as the emulgent and lanette wax SX as the antagonist Our early cases described in the paper were treated with this type of emulsion, later cases were treated with the simpler lanette wax SX (O/W) preparation described as our standard now Little difference was noted clinically , the W/O type emulsion cere alba-lanette wax SX has been discontinued in favour of the simpler O/W lanette wax SX standard mentioned

R M HEGGIE, C G BRADBURY
Aberdeen **J F HEGGIE,**

SEX AND TABOO

SIR,—I am evidently the schoolmaster mentioned by your peripatetic correspondent (*Lancet* April 11, p 456) and some account of my experience with young people may be of interest When I began teaching, some fifteen years ago I did not believe there was any sex problem among schoolboys, or I thought that if there was such a problem it was neither grave nor urgent enough to call for any special help from a teacher Since then I have gone about with boys , I have listened to their more or less familiar conversation , I have seen the sort of books they read if they get half a chance , and I have noted their reactions to the naked human body and to pictures of it My practice is now to answer questions when I am asked Boys will ask questions, sometimes indirectly, if they know they will get an answer and if they are sure they are not being laughed at If I can, I answer the question on the spot, but more often it is necessary to explain that such a matter cannot be dealt with in a sentence In such cases I ask the questioners to come to see me by my own fireside, and they generally do so in twos and threes It is not possible to consult parents Boys would have *nothing to do* with it at all if they thought their parents were going to be brought into it "I simply can't talk to my father about it," said one, and I believe that to be the almost universal experience When they have said, often with difficulty, what it is they want to know, I explain about taboo Without this, the rest means nothing There are examples in "The Golden Bough" and in Freud's "Totem and Taboo" of people who cannot say aloud the tabooed names of their dead or eat tabooed food My listeners generally find this interesting I go on *to* say that we have a taboo on sex and that we are all affected by it (including, obviously, myself) and suggest that for the next hour or so there shall be no taboo Then I answer their question Whatever it is, it always leads to an account of the processes of human reproduction It is necessary to give this account very plainly, and even crudely, in the words—mostly tabooed—which they know The taboo is broken Words are recognised for what they are—labels attached to things or actions which remain the same whatever they are called After

The problem of mixed infections is rather different, but in our experience gr 10 daily for ten days is adequate The so called anti relapse treatment is useless To give a patient quinine gr 10, 20 or even 30 once a week in the hope it will prevent a relapse in the future does nothing but make the patient uncomfortable

These remarks apply only to persons returning to this country after having suffered from malaria in an area where it is endemic In order to conserve quinine it should not be given until a relapse occurs and then not only when the diagnosis has been confirmed by blood examination A patient returning to this country may never relapse, and even if he does, in the case of *P vivax*, it may not be for six months or a year after his last attack

Blood films (preferably unstained) for malaria parasites can be examined free of charge if sent to this laboratory

Malaria Laboratory
(Ministry of Health)
Horton Emergency Hospital, Epsom

W D NICOL,
P G SHUTE

ACCURATE BLOOD-GROUPING

SIR,—In your annotation of April 25 (p 509) the description of the methods used in this unit for the diagnosis of the ABO system of groups contains two mistakes which we think are important enough to need correction The first is the statement (in line 36) that, after capping, tubes are "kept in the cold for 2 hours", actually our description was "left undisturbed on the bench at room temperature for two hours, after which readings are made" The second (sixth line from bottom) is just a verbal slip "antibody α" should read "antibody α_1"

Galton Laboratory Serum Unit,
Cambridge

G L TAYLOR,
R R RACE

CASE HISTORY IN DIAGNOSIS

SIR,—Schweninger told this story about his first meeting with Bismarck Bismarck received him with the words "I don't wish to be interrogated, with your high reputation you must find out my disease by yourself" "Agreed Excellency," replied Schweninger, "then I will place myself in charge of you as a veterinary physician" That Bismarck was not offended by this remark was shown by the fact that Schweninger remained his physician until he died Nothing was further from my mind than to depreciate veterinary medicine, I was for many years Zuntz's assistant at the Tierphysiologisches Institut

London, W 1

J PLESCH

BLOOD IN THE STOOLS

SIR,—I venture to anticipate that many will share my surprise at the discovery of L Schiff and his colleagues that a tarry stool can result from so comparatively small a volume of blood as 100 c cm introduced into the alimentary canal I have had no opportunity as yet of reading their original article and am quoting from your annotation of April 18 (p 482) At a guess I should have expected a minimum of at least three times this volume and it is a consolation to receive reassurance that a tarry stool does not necessarily indicate a large hæmorrhage I can confirm the further observation that blood or rather its products of digestion can persist for fourteen days, as represented by a positive occult-blood reaction, after the ingestion of a single large dose which would correspond to a single substantial hæmorrhage, a circumstance which has the inconvenience of leaving uncertainty whether hæmorrhage may not be continuing I have, in fact, importuned my physiologist and pathologist friends to devise some method or test which would differentiate fresh blood from its decomposition products, but this, apparently is asking too much and decision must be based on clinical and other laboratory considerations

Another practical point which may be worthy of attention is this What is the minimum quantity of blood which would subsequently produce a positive reaction for occult blood in the stools? I was stimulated to an elementary research 28 years ago through the assertion of a leading pathologist of the day that the faintest trace would yield an unmistakable benzidine reaction so that not only must every trace of hæmoglobin containing food be withheld, but the greatest care exercised in brushing the teeth since hæmorrhage from the tinest abrasion would be sufficient to invalidate the test For several weeks I lived on a hæmoglobin-free diet ingesting measured quantities of my own blood until a positive reaction could be recognised, and I came to the conclusion that at least 15 minims or practically a full cubic centimetre was the minimum If my investigations were reliable they suggested that extreme precautions however commendable scientifically were not in practice necessary I had hoped to have extended the investigation to determine whether ingestion of frequently repeated smaller quantities, (say) half a minim hourly, led to a positive result with greater certainty than the larger volume taken at one dose, but apart from the inconvenience of subsisting indefinitely on a hæmoglobin-free diet, the intervention of the war ended my opportunities The same idea must surely have occured to others who may have worked on a scale which would dispose of any doubts introduced by my little personal research and made it possible to dogmatise where to draw the line between strictly scientific and conveniently clinical tests

Brook Street, W 1

ADOLPHE ABRAHAMS

DOUBTS ON VITAMIN K FOR THE NEWBORN

SIR,—Your annotation of April 18 (p 481) is so misleading that we feel it gives a false impression not only of the findings of Sanford and others (*J Amer med Ass* Feb 28, 1942, p 697) but also of the present status of *hæmorrhagic disease in the newborn* After discussing the "physiological" prothrombin levels in the newborn on the basis of data which agree qualitatively with those of all other investigators, Sanford and his colleagues draw attention to the occurrence of a number of minor "hæmorrhagic manifestations"—bruises, asphyxial hæmorrhages and transient melæna or hæmatemesis—which may occur in the presence of a normal prothrombin index On this basis, and on the finding of a uniformly normal clotting time, Sanford concludes, quite legitimately, and moreover reiterates categorically, that these are not manifestations of hæmorrhagic disease of the newborn Yet in your annotation you reprint his table and summarise it in the words "these surprising results" Moreover, you do not mention that all the infants with these "hæmorrhagic manifestations" reported by the American authors recovered without any treatment—a clear indication of their triviality and insignificance The surprising thing is that these conditions should ever have been included in the category of hæmorrhagic disease—as "palpably absurd" an inclusion as to consider all external or subcutaneous bleeding in the jaundiced patient as evidence of prothrombin deficiency

The characteristic of hæmorrhagic disease in the newborn is gross deficiency of the plasma prothrombin, hence the term pathological hypoprothrombinæmia of the newborn previously applied to the condition by one of us In addition, the clotting time is prolonged, and bleeding may occur superficially or internally and is persistent Under these circumstances no disappointment will await the prudent clinician who gives vitamin K He will relegate to their proper station such minor accidents as have been made so much of in your annotation under the caption "hæmorrhagic manifestations" and will continue to look out for and successfully to treat, with vitamin K or its analogues, the serious bleeding which results from severe prothrombin deficiency in the newborn

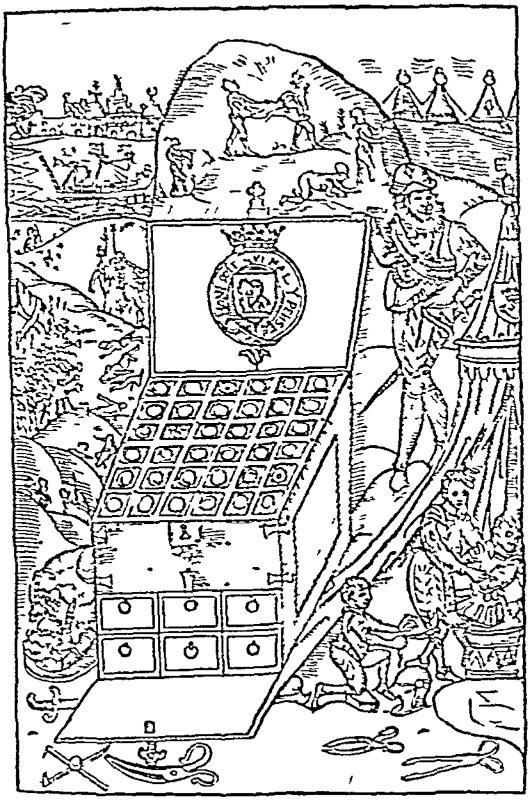
Simpson Maternity Pavilion
Royal Infirmary, Edinburgh

A I S MACPHERSON,
J L HENDERSON

MIGRAINE

SIR,—Dr Leyton's train of thought about the ætiology of migraine prompts me to bring forward my own approach and the measure of success I have obtained An article by Dr J Freeman suggested to me its possible allergic nature and I therefore tried non-specific desensitisation using peptone (Armour), first dose 0 25 c cm increasing 0 25 c cm per dose at 5-day intervals to a maximum of 2 0 c cm In the event of an attack or reaction, either urticaria or headache, the last dose was repeated 5 days after the reaction had subsided Here are brief notes of two cases

1 Female, aged 40, hysterectomy 12 years before, having severe attacks twice weekly with intermediate heaviness of head amounting almost to headache Stilbœstrol and 'Antuitrin S' tried with no result First course of peptone 1 months ago After 4 doses, attacks less frequent and severe and intermediate headache vanished Second course



Military Medicine Chest
From "Young practitioners of Chirurgery," by William Clowes, 1588

human gall-stone given to those who had gall-stones of their own, oil of amber used for plague and epilepsy, balsamo artifiato composed of aloes, galingal, myrrh, amber, turpentine and musk for dressing wounds, *Elixir vitæ*, containing 22 ingredients including ginger, orris, mint, thyme, cloves, nutmeg and cinnamon, and a powder for delirium made from antimony, sulphur and coral In the second drawer were otoliths, called in the middle ages "Peter's stones, they were regarded as a specific for colic or alternatively could be carried as an amulet to protect the wearer from injury In the bottom drawer were pieces of unicorn's horn, the famous antidote used against all poisons, also given for gonorrhœa, extract of guaiacum used for syphilis; *Unguento da Caroli*, employed in venereal diseases, *Unguento gratia Dei* used for dressing wounds to prevent gangrene, *Orvietano*, a celebrated remedy for plague and smallpox to be found in the first London Pharmacopœia, treacle of Andromachus (invented by that notable physician to Nero) which contained 65 ingredients and was used for plague, and specimens of *Terra sigillata*, the famous "sealed earth of Lemnos" which was regarded as an antidote to all poisons and a remedy for plague

On the whole it seems that plague was the disease most dreaded in warships, since they put in at many Near Eastern ports, infection might well be carried aboard by the crew, and venereal diseases were evidently also prevalent

A striking contrast to this naval chest is to be found in the massive military chest depicted by William Clowes in his treatise addressed to "Young practitioners of Chirurgery" and printed in London in 1588 William Clowes was born in 1563, served as surgeon to the army in France, under the Earl of Warwick, and became chirurgeon to Queen Elizabeth in 1596 He was attached to St Bartholomew's Hospital in 1591 The chest illustrated in his book is very large and contains three trays for bottles, 36 in the top tray alone while below are six drawers for other containers A military chest, almost intact, found in a castle near Genoa and is made of pine covered with leather and bound with heavy iron clamps It measured 26 in by 12 in, and the lid was protected by strong iron hasps Inside were spaces for instruments of which only a brass spoon, a horn-spoon and a spatula with double ends for measuring powders, remained The top tray contained 30 square bottles, and the whole was lined with green cloth edged with gold tinsel braid The bottles were of the white glass of the seventeenth century and contained sublimed sulphur, *Liquor anodin*, *Tinctura castorei*, spirit of cornu cervi, laudanum, *Myrrha croco, Syrupus dicodii*, Kermes mineral, *Confectio alkermes* and cinnamon water All these were drugs typical of the period The liquid anodyne was a spirit of ether, tincture of castor was employed as an antispasmodic and sedative, spirit of hartshorn as a stimulant, myrrh and antimony were used to arrest hæmorrhage, syrup of dicodium was syrup of poppies, kermes mineral was antimony oxysulphide and confection of alkermes, a preparation of cochineal, apples, rose water, ambergris, pearls and musk. The second tray contained a pestle and mortar of grey schist, another of brass for pounding hard substances, and a pair of apothecaries scales with brass pans, with a set of weights, a roll of white leather to use as a base for plasters from which several pieces had already been cut and shaped for fly blisters The bottom of the chest was divided into compartments to hold bottles and canisters for gum Arabic, sal ammoniac, sugar candy, jalap root, Peruvian bark and potassium acetate, there were also a large brass pestle and mortar, a pewter measure graduated in ounces, and a funnel

ANOTHER PAPER CONTEST

THE last waste-paper contest between local authorities was so successful that another is to be held between May 1 and July 31 This time the competitors will be divided into three divisions—borough, urban and rural councils—and a prize of £2500 is offered for each division, with another for Scotland The munitions industry needs more and more paper and the Salvage Board is no doubt right in thinking that households and offices can still supply it by turning out the old letters and other papers, books and journals they have stowed away.

Medical News

University of Manchester

At recent examinations the following were successful —

THIRD M B CH B EXAMINATION

Pathology and Bacteriology —D J Atherton, Margaret A Barber Alice I Burke, Margaret R. Burke, William Clegg Lionel Erin, Frank Fletcher J W Fletcher, Edmund Isherwood, R. M Laslett Thomas Moss, Arthur Ramsden, P H Penton, M M Rose, Bernard Samuels, Pauls Vulfsons, Margaret Wardle

Pharmacology —Margaret A Barber R B Broughton, Samuel Epstein G V Feldman, Margaret Hedley, E V Mellor, and Nancy B Penney

University of Glasgow

On April 18 the following degrees were conferred —

M.D —* W F Anderson (with honours), G L Brown, Ian Campbell, I M. Davidson, Robert Gibson, and J B Macdonald.

* In absentia

M B, Ch.B —A S Anderson, Thomas Anderson, William Anderson, W L Anderson R V Bannister Peter Beattie, Ernest Bebbington, Benjamin Bernard, R H Bowie Robert Burns R. M Calman M M Campbell H O Chisholm T A Cockburn William Craw W M B Davidson Marion Ferguson Alexander Finlayson, Maurice Fogell Archibald Forrest Esther M Forsyth, Marion H. Fraser W D Fraser T B Gardiner, R S Gibson, R D Glaister, J S T Goldie A M Greenshields Donald Gregory, J R. G Grice, W G Harrington, A H D Hunter, F W B Iveson, William Jack I J MacCammond I F McCaw H M McDonald A J McKendrick, Patrick McKillop John McKimmie A A. McKirdy, S C Macmillan, A T McNeil James Macpherson David Martin Jane H Merry, David Mitchell J E Morton T M Park I S Phillips, Normana R. Plews, J S M Pollock, J S S Pollock T M Pollock, J M Rosie Maeve Rusk, J W Sandler Israel Shenkin, Max Sluglett, Alexander Starritt Thomas Stevenson I H Stewart, S D Thomson Elizabeth P Wade-Evans and J F H Wood

Bellahouston Medals, for eminent merit in M D thesis, were awarded to the late Surgeon Lieutenant R. M Calder, to Dr Margaret Crawford and Dr A. C Lendrum

Scottish Conjoint Board

On April 18 the following having passed the final examination of the board were admitted licentiates of the Royal Colleges of Physicians and Surgeons of Edinburgh, and the Royal Faculty of Physicians and Surgeons of Glasgow —

Aaron Bernstein H B Bieber Lois C Burgh, A W Chambers, Pasquale Cherico H C Denis George Fahmy Elizabeth H C Geach William Gibson S W Grant R. I Greenblatt I V Hankins N M. Jaret S M. Kahn, J H Kelly, Norman Margolis Robert Meek, Lionel Naftalin, R. A. Ramsay, R. M Rizkalla, Gurdeep Singh A U Somerville T A Spitz, Leonard Stone, K T Sweeney, G N Tyler and Philip Weyman

this point, questions are nearly always asked freely, many of them being small physiological inquiries which can be answered fully and exactly in a few moments Other questions are of the greatest social and moral importance Boys vary enormously in the extent and accuracy of their knowledge, but they are all deeply interested They listen attentively to such suggestive guesses as the theory of recapitulation Aldous Huxley's "Fifth Philosopher's Song" (quoted in "The Week End Book") and Laurence Housman's speculations on "What is indecency?" strike them as pertinent comments Many of them have given the matter a good deal of thought "I'm quite sure that if people only understood it as you've explained it, about taboo, they'd behave in a different way," said one, speaking, I think, for many

Of course, "sex-instruction" cannot create intelligence where it does not exist It can only release intelligence from fear Boys who have seen through taboo are able to think and talk clearly on sexual matters —to say what they mean and have done with it Further, having realised how potent and how fraudulent word magic can be they are less ready to accept "witchwords" in other departments of knowledge They begin to be free men They get, perhaps, an inkling of what is meant by intellectual integrity and moral courage and it should help them to face the perplexities of the future with clearer heads and stouter hearts

Chester R W **Faint**

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED APRIL 18

Notifications —The following cases of infectious disease were notified during the week smallpox, 0, scarlet fever, 1027, whooping-cough, 1555, diphtheria, 786, paratyphoid, 8, typhoid, 11, measles (excluding rubella), 4087, pneumonia (primary or influenzal), 1089, puerperal pyrexia, 162, cerebrospinal fever, 158, poliomyelitis, 3, encephalitis lethargica, 5, polioencephalitis, 1, dysentery, 208, ophthalmia neonatorum, 108 No case of cholera, plague or typhus fever was notified during the week

Deaths —In 126 great towns there were 1 (0) deaths from an enteric fever, 2 (0) from scarlet fever, 3 (1) from measles, 16 (3) from whooping-cough, 16 (0) from diphtheria, 44 (7) from diarrhœa and enteritis under 2 years, and 36 (4) from influenza The figures in parentheses are those for London itself

Oxford reported the fatal case of enteric fever, Birmingham had 5 deaths from diarrhœa and 3 from influenza

The number of stillbirths notified during the week was 232 (corresponding to a rate of 36 per thousand total births), including 18 in London

---

Dr **Robert Livingston Loughran**, who died on Feb 27, was from 1924–36 the efficient and devoted secretary of the American Laryngological, Rhinological and Otological Society Born in 1873 the son of Robert Loughran, M D, of Kingston, N Y, he graduated A B from Princeton University in 1895 and four years later obtained his M D at the College of Physicians and Surgeons, Columbia University His work in his specialty won recognition and he became assistant surgeon to the ear department of Manhattan Hospital, attending otologist at the New York Post-Graduate Hospital, and assistant attending otologist at the Lying-in Hospital He joined the staff of the New York Post-Graduate Medical School as instructor and eventually became professor of otology During the last war Loughran served as a major in the Medical Corps and for two years acted as superintendent of the Ancon Hospital and chief health officer of the Panama canal district After his retirement from medical work in 1934 he settled in Sharon, Connecticut, where carpentry and loom-weaving claimed much of his leisure

Messrs H R **Napp** Ltd are issuing a new non-toxic sedative elixir called 'Hypnasol' which contains urethane 6 9%, sodium bromide 6 9%, hyoscyamus 0 92%, liq malt extract 25%, with aromatic carminatives

In the proof of the fifth addendum to the BP, reviewed on page 518 of April 25, the dose of *liquid extract of squill* was incorrect, it should be min ½–3

NAVAL AND MILITARY MEDICINE CHESTS

C J S **Thompson**, M B E

HON CURATOR OF THE HISTORICAL COLLECTION, ROYAL COLLEGE OF SURGEONS OF ENGLAND

Some in the Services today may care to glance back at the medical equipment with which the Navy and Army were supplied four hundred years ago The medicine chest, as such, has a very old history, a specimen, still extant, was discovered at Thebes near the end of the last century, which had belonged to the Egyptian queen, Mentu-Hotep, in about 2200 B C The outer case, stoutly built of wood and evidently intended for transport by camel, bears the royal cartouche The enclosed chest is made of closely plaited papyrus, and contains spaces for six alabaster jars When found it held several medicinal roots, a wooden spoon, and some small instruments, probably used for toilet purposes From the time of the Pharaohs until recent centuries little is known of the materials supplied to the surgeons who accompanied armies in the field, except that pitch and other tarry substances were chiefly used for the dressing of wounds Celsus tells us that the Greeks and Romans applied honey or wool dipped in oil or cauterised wounds with a red-hot instrument—a treatment continued till the time of Ambroise Paré In England, when Henry V voyaged to France in 1415 to fight at Agincourt, Thomas Morstede his surgeon was allowed three archers for his protection and twelve assistants or "surgeons' mates" There is no record of the drugs they carried, but presumably they included the "vulneries" employed at the time Some idea of the variety and number of these may be gathered from Fabricius the Swiss Army surgeon who recommended, in the sixteenth century, that the military chest should be furnished with 362 varieties of medicines, some of which contained 64 ingredients

The discovery of an old naval medicine chest in a town on the Adriatic a few years ago furnished us with the names of some of the drugs and medicinal preparations usually carried, and gave a clue to the diseases which the medical officer might be called upon to treat Judging from the heraldic devices which it bears the chest belonged to an admiral of the Venetian fleet who commanded a war galley in the Mediterranean between 1546 and 1650 Such galleys were mostly triremes propelled by upwards of a hundred convicts or slaves chained to the oars Each ship carried fighting men, a Capuchin Friar and "two doctors with two medicine chests fitted with the necessary medicines" who embarked on each galley to look after the men The chest discovered was made of stout chestnut-wood covered with leather it was 27 in long and 14 in high, and had two bronze handles and protective metal bands Inside the lid was a painting of the "Triumph of Hygeia" The upper compartment contained 153 bottles and vessels with parchment tops Their labels showed them to have contained such things as *Acqua di Scordio Vero*, made from the water germander and chiefly employed internally for fevers and plague or applied externally for wounds and ulcers, *Acqua di Carduo Santo*, distilled from *Carduus benedictus* which was given in quartan and other fevers (and which Beatrice, it will be remembered, was advised to take as a cure for gloom about Benedick), *Acqua d'animidi Persiche*, which was distilled from peach kernels and given for internal tumours, gout and ulcerated throats, *Acqua di scorzonera*, distilled from serpentary roots used for plague, and *Acqua ruta capraria* or rue water, taken as a preservative against plague, fevers and colic There were also two small bottles to hold *Olio di centianni* or oil of scorpions—used to prevent plague and as an antidote to poisons—and *Olio di mirto* or oil of myrtle, employed as an astringent and stomachic

Below the compartment were three drawers, the top one containing 56 bottles of varying capacity each with a pewter stopper The second drawer contained two flat boxes with sliding lids for plasters, while in the centre was a pair of apothecary's scales with steel beam and brass pans and a small agate mortar The third and bottom drawer contained 76 rectangular pewter boxes for holding pills, powders and ointments There were bottles for oil of vipers used for gout, leprosy and in skin diseases, cedar bark oil for snake-bites and plague,

SEVERE HÆMORRHAGE FROM STOMACH AND DUODENUM

II. GENERAL LINES OF TREATMENT *

T. IZOD BENNETT
M D LOND., F R.C P
PHYSICIAN WITH CHARGE OF OUTPATIENTS, MIDDLESEX HOSPITAL

JAMES DOW
M B CAMB , M R C P
TEMPORARY ASST PHYS , ST GEORGE'S HOSPITAL BLOOD TRANSFUSION OFFICER (EMS)

SAMSON WRIGHT, M.D LOND , F R C P
PROFESSOR OF PHYSIOLOGY, MIDDLESEX HOSPITAL

(From the Courtauld Research Wards, Middlesex Hospital)

IN March, 1935, two of us (T I B and S W) began an inquiry into cases admitted to the research wards on account of dangerous bleeding from the stomach and duodenum , 137 patients have been observed, of whom 6 have been admitted twice and 2 on three occasions During the last year we were able to observe a higher proportion of cases before admission, and owing to this, and to wider knowledge of the special service available, the proportion of severe cases admitted has been higher than before. From the outset cases were accepted only when a casualty medical officer considered that the degree of hæmorrhage was sufficient to endanger life Such a criterion however cannot preclude personal error, misinformation from outside, or hasty judgment of clinical appearances which may readily lead to admission of a trivial case Observations of blood-pressure and pulse-rate, and estimation of the percentage of hæmoglobin are by no means simple to interpret Our earlier communication endeavoured to show that there is only one reliable method † of assessing severity in cases of hæmorrhage—estimation of total blood-volume, both as regards total volume of cells (Vc) and total volume of plasma (Vp)

The important principle involved is shown in fig 1 in which the columns represent total blood-volume before and after a severe hæmorrhage The left-hand column shows the normal average content of cells and plasma estimated in c cm. per kg of body-weight; when a sudden severe hæmorrhage takes place there is an immediate amputation of a certain fraction of the total blood of the body, producing the state of affairs seen in the second column. Loss of cells and plasma being equal in degree, the total blood-volume is greatly diminished, *but the percentage of hæmoglobin remains unaltered*, and only after a variable period does the circulation take up fluid sufficient to restore the original Vp, thereby diluting the Hb until this is reduced to a figure which, provided bleeding has stopped, gives some true index of the gravity of the case The next three columns show how during a period of weeks the red blood-cells regenerate, restoring both the blood and the Hb percentage to normal Continued or repeated hæmorrhage still further complicates the interpretation of the mere Hb estimation

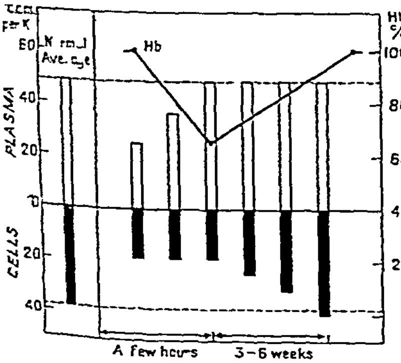


FIG 1—Diagram to illustrate restoration of plasma-volume after single severe hæmorrhage, with slow restoration of Vc during subsequent weeks and consequent effects on hæmoglobin percentage

With the help of such observations it has been possible to classify our cases into three groups (I) mild, in which hæmorrhage amounted to less than 20% of the normal Vc; (II) moderate, when the loss was from 20% to 50%; and (III) severe, in which the loss exceeded 50% Our cases up to the end of July, 1939 classified thus, are set out in fig 2, which shows that, although every case was admitted because life appeared to be in danger, a considerable number proved to be quite mild, only a small amount of blood having been lost Any consideration of prognosis or of the merits of different forms of treatment will clearly be seriously affected if all three classes are considered together , and we feel justified in suggesting that in no previous paper dealing with these problems are to be found data derived from cases of proven gravity ‡ In the later months of our inquiry we have eliminated many mild cases by personal observation before admission has been decided on and for this reason the proportion of severe cases is higher , but we remain convinced that there are no means at present available, other than exact observations of blood-volume, which can enable any observer to distinguish with certitude between our moderate and severe groups

A difficulty in classification arises from the fact that a mild or moderate case may become converted, by renewed or continued hæmorrhage, into a severe case When this has occurred we have placed the case in the severe group This fact must be borne in mind when making deductions about prognosis and treatment, for example, all fatal cases are naturally shown in the severe group, but care must be exercised to determine whether or not they were in this group when first coming under observation. The chief purpose of this investigation has been to obtain accurate information about prognosis, cause of mortality, and the best methods of treatment in cases of really dangerous bleeding To give information of real value such an inquiry must needs be protracted, and it presupposes scientific control over diet, drug treatment, transfusion, &c

* * *

Before describing detailed treatment let us define what we have sought to achieve and what we have tried to prevent Our efforts in treating a patient are directed towards providing favourable conditions for the body to carry out its healing processes All are agreed that the first premise in this effort is to obtain rest for the stomach and rest for the patient but these broad principles are often overlooked in arguments about diet and niceties of fluid balance We believe that

1 Rest for the body is best obtained by rest in bed in a semi-somnolent state until bleeding has stopped

2 The fluid reserves of the body should never be allowed to become depleted to such an extent that the normal bodily functions are gravely disturbed—i e , the patient should not be allowed to become dehydrated

3 A sufficient food intake should be provided to sustain the body during a period of illness which may be prolonged, but no food should be given which will obviously irritate the alimentary tract, either mechanically or chemically

4 When a patient suffering from hæmorrhage, gastro-duodenal or otherwise, has bled to a stage where a further sudden hæmorrhage is likely to prove fatal, he must be given a blood-transfusion until that dangerous level is exceeded, and transfused in such a way that hæmorrhage is not made more likely by the process

5 A few cases of gastro-duodenal bleeding from chronic peptic ulceration show evidence that the hæmorrhage is unlikely to stop These cases should be treated surgically, provided that the lesion is known to be accessible, that the patient is in a reasonably fit state for operation, and that expert surgery is available

REST

The patient is placed in a warm bed with an electric cradle or blanket if this is required, and with the head raised at most by a simple pillow During the first few days he is allowed to do nothing for himself Morphia is given at once in a ¼-grain dose, provided there is no clinical evidence of cirrhosis of the liver, and repeated as necessary to keep the patient somnolent but not deeply asleep until the bleeding has stopped It is only rarely that more than 1 grain is required in the first 48

---

* Part I Criteria of Severity written in collaboration with Dr F P Lee Lander, appeared in *Lancet*, 1938, ii, 651

† It is not suggested that every case of bleeding from the alimentary tract should be investigated in this way It is, however, certain that a detailed study of the results of such investigations would enable one to assess more accurately the value of hæmoglobin [illegible]

‡ This is doubtless a major factor in determining our comparatively high mortality-rate

Royal College of Obstetricians and Gynæcologists

At a meeting of the council held on April 25, with Prof W Fletcher Shaw, the president, in the chair, F N Reynolds (London) was admitted to the fellowship and W J H M Beattie (London) and C M Gwillim (London) were elected to the fellowship

The following were admitted to the membership —

V H Barnett, R A M C, H H F Barns, R A F, Mary A Murray Bigby, London, A B Concanon, London, Mary D Daley, London, M L Gaudin, Canada and R A F, L A Ledingham, London, K M MacKenzie, Sheffield, and Lilian M N Raftery, London

At the annual general meeting of the college held afterwards, the following were elected to council in place of those retiring

Representatives of the fellows —Mr William Gilliatt London, Prof A M Claye, Leeds, Dr E C Fahmy, Edinburgh, and Mr C H G Macafee, Belfast

Representatives of the members —Mr A C H Bell, London, and Dr Hector Ross MacLennan, Glasgow

Conjoint Qualification

As a war emergency measure candidates are now admissible to the last subject of the final examination for the L R C P, M R C S, diplomas after thirty months of clinical study, instead of thirty-three The emergency regulation permitting a candidate to enter for one part of the final examination after twenty-four months of clinical study is not affected

Course on Industrial Medicine at Leeds

A week end course on industrial medicine will be held at the Firth Institute of Pathology, University of Leeds, on May 30 and 31 The opening paper will be given by Dr J C Bridge on some medical aspects of factory legislation Other speakers will include Dr R E Lane, Dr S A Underwood, Dr J T Ingram, Judge Frankland and Mr John Foster, F R C S Further information may be had from the dean of the school of medicine, Leeds, 2

Medical Casualties

In recent casualty lists the deaths are announced of Major A C Elliott, M B Dubl, R A M C and Major A W P Todd, M C, M B Dubl, R A M C Surgeon Commander A N Forsyth, M B Aberd, R N, reported missing last August, is now known to have been killed on active service Major J W D Bull, M B Camb, D M R, R A M C, and Lieutenant R H Cuthbert, M B Edin, R A M C, have been posted as missing since the fall of Singapore

Tuberculosis Association

A meeting will be held at 26, Portland Place, London, W 1, on Friday, May 15, at 4 30 P M, when Dr J E Stokes will read a paper on a scheme for the prevention of tuberculosis Afterwards the discussion held at previous meetings on the rehabilitation of the tuberculous will be continued

Royal Society of Arts

On Wednesday, May 6, at 1 45 P M, Prof J C Drummond, D Sc, will speak on war time nutrition and its lessons for the future *Lord Woolton will be in the chair, and the meeting* will be held at the house of the society, John Street, Adelphi, London, W C 2

Biochemical Society

The next meeting of this society will be held at St. Mary's Hospital medical school, Paddington, W 2, on Saturday, May 9, at noon

Association of Scientific Workers

The executive of this association has set up a provisional medical sciences committee "to further the objects of the A Sc W among scientific and technical workers concerned with the medical and ancillary sciences" The first meeting will be held on Saturday, May 9, at 3 P M, in the Small Conway Hall, Red Lion Square, London, W C 1 Further information from Dr J H Humphrey, 32, West Hill Court, Millfield Lane, N 6

Royal Society of Medicine

The section of medicine will meet on Tuesday, May 5, at 3 P M, to discuss the Workmen's Compensation Act as a factor for prolonging invalidism The opening speakers will be Dr Bernard Hart, Mr H E Griffiths, and Dr Tom Eastham, K C At the section of history of medicine on May 6, at 2 30 P M, Dr Douglas Guthrie will read a paper on Jerome Cardan, physician, astrologer and mathematician 1501–76 The annual meeting of the section of surgery will take place at the Central Middlesex Hospital, Acton Lane, N W 10, on May 8, at 2 30 P M, and afterwards cases will be shown On the same day at 3 30 P M the section of ophthalmology is holding a clinical meeting at the Tennent Institute, Glasgow

Hospitals Day 1942

This year the voluntary hospitals of London are holding their hospitals day on Tuesday, May 5 Further particulars may be had from London Hospitals Street Collections Central Committee, 36, Kingsway, W C 2

Health and Education in Nursery Years

The Nursery School Association of Great Britain has chosen this subject for its summer schools which meet this year at Edinburgh on July 11–25 and at Oxford on Aug 4–18 At both courses lecturers acquainted with Poland, Czechoslovakia, Russia, India, China and the Dominions will describe the care of children in the allied nations At Edinburgh Dr T Y Finlay will give four lectures on safeguarding the health of children in nursery groups, and at Oxford Dr William Blatz, director of the institute of child study of the University of Toronto, will discuss child development and its effect on nursery school education Further information from the secretary of the association, Hamilton House, Mabledon Place, London, W C 1

Mr Gerald Hughes, F R C S, has been elected governor of the Merchant Adventurers Company of York

Surgeon Rear Admiral W H EDGAR has been appointed an hon physician to the King, in succession to Surgeon Rear Admiral G F Syms, who has retired

At a sitting of the South Western Conscientious Objectors Tribunal at Bristol Dr Conrad Latto was granted exemption from military service on condition he remained in the medical profession

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export

Appointments

BENTLEY, C A, C I E, M B EDIN, D P H temp asst M O for civil defence casualty services at Coventry

FULLERTON JANE, M B BELF asst school M O for Huddersfield

RODGER, WILLIAM, M B GLASG, D P H assist *M O H for* Stockton on Tees

STEINER GEORGE M D VIENNA radio diagnostician at Bristol Royal Hospital

Births, Marriages and Deaths

BIRTHS

BALFOUR —On April 20, in London the wife of Surgeon Lieutenant H Melville Balfour, R N V R —a daughter

BARBER —On April 25, at Gerrards Cross Bucks, the wife of Squadron Leader H S Barber, M D, R A F O —a daughter

DODDS —On April 18, at Bangor Northern Ireland, the wife of Surgeon Lieutenant G R Dodds, R N V R —a son

HOWELL —On April 17, at Tonbridge, the wife of Lieutenant William Howell, R A M C —a son

LEWIS —On April 19, at Gatley, Cheshire, the wife of Dr A A G Lewis, of Manchester—a daughter

McDONAGH —On April 25, at Edinburgh, the wife of Dr T O McDonagh, of Stanley, Perthshire—a son

MARRIAGES

GOLD—HENRY —On April 18, in Edinburgh, James Munro Gold, surgeon lieutenant, R N V R, to Louisa Margaret Henry

MARSHALL—PALMER —On April 24, in London, J H Marshall, captain, R A M C, to Bridget Palmer, Q A I M N S

MARTYN—ROUHIER —On April 21, in Glasgow, David Martyn, surgeon lieutenant, R N, to Gladys Rouhier

DEATHS

BROGDEN —On April 23, at Hove, James England Brogden, L R C P E, lieut colonel, R A M C, retd, formerly of Ryde

BUCHAN —On April 22, at Baring Road, Grove Park, London, S E 12 Carl Joseph Barrett Buchan, M B GLASG

COHEN —On April 18, at Dane Court Bishops Avenue, N 2, Charles Leon Cohen medical superintendent of the Belgian Red Cross London and professor of pædiatrics in the University of Brussels

HAINES —On April 21 at Rochdale Edward Haines, M R C S, D P H, surgeon R N, retd aged 69

HIRSCH —On April 23 in London Leonard Hirsch C I E, F R C S E lieut colonel, I M S retd of Llandrindod Wells aged 62

HOSFORD —On April 22, Arthur Holloway Hosford, M R C S, of Eastbourne and Leeds

LEGGATT —On April 23, Gerard Stedman Leggatt, M R C S, of Hove

McNAUGHT —On April 25, at Penzance, James Gibson McNaught, M D GLASG, D P H, lieut colonel, R A M C, retd

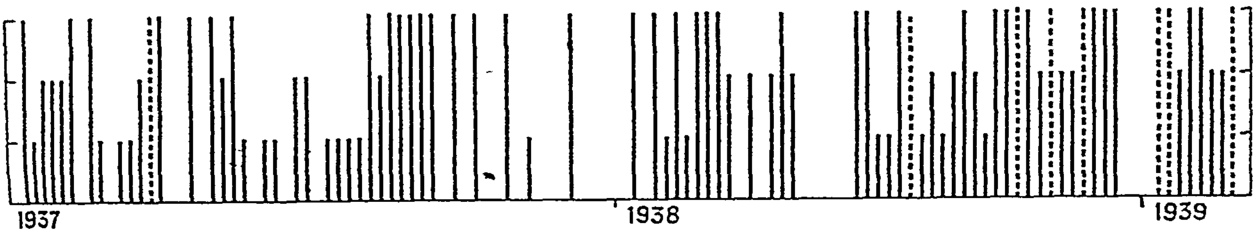
RAWNSLEY —On April 15, in Malta, Gerald Thomas Rawnsley, C B C M G, M R C S, colonel, late R A M C retd aged 77

REID —On April 27, at Crowborough, Robert Watson Reid, M B ABERD

STURGE —On April 21, at Welwyn Garden City, Henry Havelock Sturge, M R C S, L S A

TAIT —On April 11, in India Alastair Tait, M B ABERD, lieut colonel, I M S

FIG 2 (*continued*)



also those of Cullinan and Price,[8] give reasons, based on theoretical grounds, why transfusion wrongly applied can be a dangerous procedure

(*a*) Transfusion is liable to cause recurrent hæmorrhage, due most probably to a rapid rise in blood-pressure

(*b*) The reactions following transfusion may prove fatal

(*c*) Transfusion before surgery may make the surgeon's task more difficult as a result of increased bleeding in the surgical field

With the first statement we agree in part If blood is administered so quickly (fig 3) that a rapid rise in blood-volume occurs, further hæmorrhage would seem probable Given at 30–40 drops a minute the blood-pressure does not rise, it may indeed fall, unless the initial reading is taken within a few minutes of the actual bleeding, when a condition of "shock" is present Nor does any significant rise in plasma-volume take place In each case investigated the blood-volume remained constant within the limits of experimental error, increased only by the amount of cells added (see table)

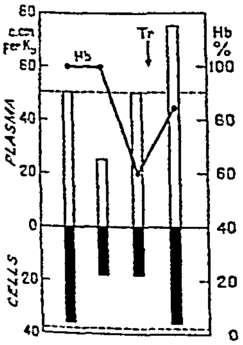


FIG 3—To illustrate risk of creating excessive blood volume by over-transfusion or transfusion given too rapidly

With recent improvements in technique, severe reactions should no longer occur Doubly distilled water for the anticoagulant solution, care that the blood is at body temperature when it flows into the vein, and (most important of all) correct grouping and cross-grouping have eliminated this risk.

Finally, if surgery is to be employed, it is unlikely that any surgeon will be willing to operate without the aid of transfusion It is, as Hurst and Ryle remark, "an almost essential preliminary in the rare cases in which surgery is indicated "

We find then in our series no basis for the belief that hæmorrhage is made more likely by transfusion Among the 137 cases 40 were transfused and 8 of them bled again, 97 were not transfused and 25 of them bled again The proportion of bleeders is slightly higher in non-transfused cases Of reactions there is little to say, except that no serious reaction has occurred No instance of mismatching was observed

CELL AND PLASMA VOLUME BEFORE AND AFTER TRANSFUSION

No	Before transfusion		Amount of blood given (c.cm)	Time (hrs)	After transfusion	
	Plasma volume (c.cm)	Cell volume (c.cm.)			Plasma volume (c cm)	Cell volume (c.cm)
1	3850	500	1170	21	3950	1100
2	3400	350	800	21	3500	750
3	3650	700	2100	24	3600	1650
4	2600	1000	1000	12	2600	1450
5	2450	900	1900	17	2300	1800

We transfuse our patients when a level is reached at which one further hæmorrhage is likely to prove fatal The level we have chosen is 700 c cm red cells or 40% Hb This criterion has been fixed by our experience in which a patient with a third of his normal Vc and a considerably reduced plasma-volume died after a trivial recurrent hæmorrhage We continue transfusing at a rate of 30–40 drops per minute (1 pint in 4–5 hours), until this level is comfortably exceeded—that is, when the true hæmoglobin reaches 60%–65% In all we have transfused 40 patients, some more than once, the average amount being 1400–1500 c cm In one we gave 6000 c cm and persistence was justified by result A typical case may be quoted —

CASE 1 —Male, aged 26 No previous symptoms Melæna for one week Found to be pale and shocked BP 120/70, Hb 40%, Vc 600, Vp 2800 Slow drip transfusion of 1300 c cm in 24 hours BP 120/70, Hb 62% Vc 1200, Vp 2770 Clinical conditions much improved Uninterrupted recovery

We have almost always used fresh blood of the same group, in most cases only a few hours old, in a few as much as five days The blood has been collected by means of suction into 3% sodium citrate solution, 600 c cm have been mixed with 100 c cm of citrate We used the Marriott-Kekwick method, with the slow running capillary control in the later cases, which has shown itself ideally suited to these cases

SURGICAL INTERVENTION §

The importance of deciding the true indications for surgery in this common and dangerous condition was one of the major reasons why the present inquiry was begun Two axioms must be accepted at the outset —

(1) That any surgical operation for the arrest of hæmorrhage from stomach or duodenum must be a major one, carrying risks of grave shock.

(2) That any patient whose life is in danger owing to severe hæmorrhage must already be in poor condition to resist superadded shock

Evidence is occasionally obtainable showing that hæmorrhage is unlikely to stop ; this evidence is, unfortunately, seldom available before the case has been under observation for some time In such cases it must be remembered that tissues which have for days or weeks been receiving a blood-supply the poverty of which is indicated by a greatly reduced Hb percentage are in a poor state to respond after a major operation, and the mere restoration of the blood to apparent normal by transfusion cannot produce much immediate effect upon such tissues The physician is accordingly placed at times in a terrible dilemma when he has to weigh the slender chances of hæmorrhage stopping against the equally slender (or even smaller) chances of the patient being able to survive a major operation

It has been our fortune to have surgical aid of the highest possible quality available to us and our patients have in many instances benefited from it, but except in a few cases surgery has been delayed until bleeding has stopped and the patient has had time to recover from the consequent anæmia

CAUSE OF DEATH

Of the 18 deaths in our series we have classed 8 as being inevitable, being secondary to advanced carcinoma of the stomach or severe cirrhosis of the liver Of the remainder 9 were suffering from chronic peptic ulcer, 1 from acute ulceration None of these patients was below the age of forty, one only below fifty Post-mortem examination was made of almost all the fatal cases In 5 of the 10 patients who died from bleeding ulcer some definite complication was present, 3 were found to have widespread bronchopneumonia 1 died from peritonitis following gastrectomy, and 1 from paralytic ileus There remains a group of 5 cases in which no cause for death was found other than the hæmorrhage itself

---

§ We hope later to devote a separate paper to this subject

Fig 2

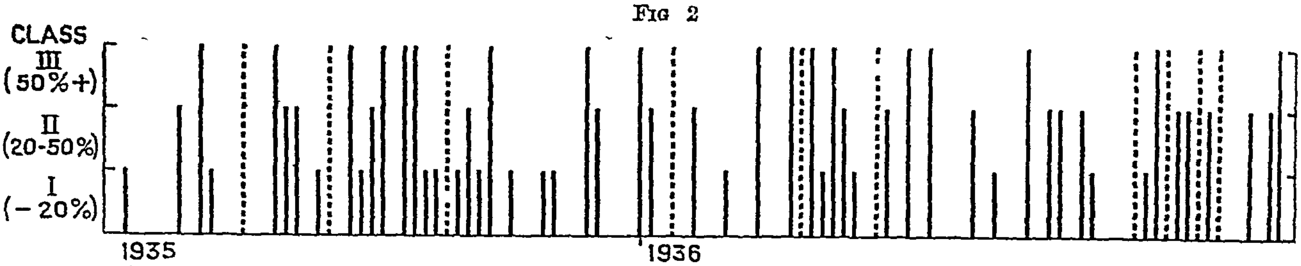


Diagram showing all cases admitted for this inquiry, classed as mild (I), moderate (II) or severe (III) according to degree of hæmorrhage determined by blood volume estimation Fatal cases are indicated by broken line

hours After hæmorrhage has ceased, as judged by blood-volume estimation, absolute rest is relaxed

FLUID AND FOOD

Early in our investigation every case was starved, during the first twenty-four hours at least, fluid being given per rectum in the form of 2% glucose saline Now all patients are allowed 2 oz of water hourly until routine feeding begins, glucose saline is being given per rectum or intravenously when repeated vomiting precludes fluid by mouth

In groups I and II no initial period of starvation is employed, in group III, the patient is fed after an interval of six to seven hours during which he is almost invariably asleep The *initial feeds consist* of 2 oz of citrated milk hourly, increased to 3 oz on the following day, with 6–8 oz of flavoured milk and glucose 2-hourly from the third day After the first twelve hours water or hypertonic saline is allowed between feeds if desired In this manner the initial fluid intake in twenty-four hours is seldom below 2 pints, and the food value is between 1000 and 1500 calories when feeding begins

When pyloric stenosis is present the stomach may become overloaded and fresh vomiting be induced by injudicious feeding even of fluids, inspection of the abdomen in the later hours of the day is usually sufficient to give the necessary warning

One form of dietetic treatment in hæmatemesis is associated with the name of Meulengracht [1] From the day of admission to hospital patients are given a full purée diet including white bread, slices of meat, cheese, and a variety of dishes In his advocacy of a diet containing sufficient water and calories to avoid dehydration and starvation we are of course in agreement, but we do not understand why the foods he recommends are selected and we feel it would be far better to secure his ends by safer means Influenced by Meulengracht's work, but fearing to make too violent a break with tradition, Witts [2] has fed hæmatemesis patients from admission on a bland semisolid diet providing 2500–3500 calories a day with a fluid intake of about 2750 c cm, with results much superior to those of starvation Avery Jones [3] has confirmed the value of this modification of the Meulengracht regime While we are satisfied that the diet used by them excludes the more obviously dangerous items, it must not be assumed that the mere increase of food permitted to patients suffering from severe hæmorrhage will reduce the danger of death

The story of the dietetic treatment of peptic ulcer dates from the work of Cruveilhier [4] nearly a century ago, firmly based on sound physiology "Rest for the affected organ," he wrote "This law so faithfully observed in the treatment of disease of other organs seems to be completely ignored when it comes to the stomach, nevertheless it is the whole secret of treatment," and again "*Le régime lacté, voila le grand moyen de guérison de l'ulcère simple de l'estomac*" Early German diets such as those of W O von Loebe began with three days of complete starvation followed by a low calorie diet, and it was to counteract the poor results of these that the graduated diet of Lenhartz was introduced This diet which included meat at an early stage has proved unpalatable to English patients, but in modified form has received some support In the U S A the regime of Sippy [5] was widely adopted during the war of 1914–18 Milk and cream with soft eggs and cereals are given in small frequent feeds with enough alkali between feeds to neutralise the gastric juice Sippy's regime is essentially that of Cruveilhier pressed to its logical conclusion, and it was not very different from that usual in London about that time On their return to general medicine after the war British physicians recognised the clarity and continuity of reasoning behind Sippy's otherwise not original idea, at any rate the diet employed in the treatment of peptic ulcer by one of us (T I B) among many others has never differed in essentials from that laid down by American physicians For example, we find ourselves in close agreement with Crohn [6] who, when discussing the dietetics of peptic ulcer, says that the food substances employed are chosen because of their ability to combine with free acid and because, by the natural ease with which they leave the stomach, rest is assured to the irritated organ Substances are avoided which require very full digestion and a high concentration or amount of free acidity, or which, by the coarseness of their texture, require a *long sojourn in the stomach before* emptying He notes that Lenhartz suggested free evacuation with long interdigestive quiescence while Sippy sought constant neutralisation by frequent feeds and antacids—two aims which are both correct and both of which can be secured

Obviously anyone suffering from severe chronic illness can best fight his disease if kept in good physical condition, and starvation militates against this Hæmatemesis does not fall within this rule' The immediate means of digesting food are gravely disorganised, the condition is an acute one, and when there is severe bleeding from the stomach it seems to us obvious folly to administer solids The patient is often suffering from nausea and we can see no practical or theoretical reason for demanding the additional work from the diseased organ which the digestion of solids entails We cannot point to a single fatal case in our series in which it is possible to imagine that a greater food intake would have saved life, of the fatal cases many were barely capable of swallowing fluids from the moment of admission, while among those who recovered were a few in whom pyloric stenosis was present in such a degree that the administration of solids would have been disastrous Statistics of the treatment of hæmatemesis with a liberal diet may be impressive, but the fact that they are treated in a modern hospital where *any emergency* can be met is apt to be overlooked In this country most cases of hæmatemesis are treated in their own homes, where any extension of latitude in the choice of food would be fraught with grave danger

Our *initial diet*—i e, 6 oz of flavoured feeds containing milk, glucose, 'Ovaltine' or some soups—is continued for two weeks, during which the patient is kept completely in bed This diet is then relaxed, eggs, fish, bread and butter being gradually added The patient is allowed up, and in the fifth week mild exercise is encouraged A barium meal is carried out at the end of this week, and if there is no demonstrable lesion left in the stomach or duodenum the patient is discharged during the sixth week Iron in adequate dosage has been given to almost every patient, and in those suffering from pain an alkaline powder three or four times a day A special clinic has been established at which old patients are seen regularly so that our follow-up may be complete

TRANSFUSION

Much has been said and written of the merits or demerits of blood transfusion in cases of uncontrolled hæmorrhage The connexion between transfusion and further hæmorrhage has been the subject of considerable speculation Hurst and Ryle,[7] discussing their views and

and occasional pink vomiting On thirteenth day diarrhœa abated and on eighteenth feeds increased to milky fluids of 6 oz hourly Blood-urea which rose to 79 before third transfusion now fell rapidly, diuresis set in on twentieth day Further progress uninterrupted Investigations negative as regards ulcer, slight irregularity at cardia (?) œsophageal varices

This case (fig 6) illustrates the treatment of a very severe case Much work was involved in its study as estimations often had to be made in the night The successful outcome was, we believe, in some measure due to the clear indications for treatment yielded by accurate observations As in case 5 the negative data after recovery suggested that early surgical treatment could not have improved the progress and might well have been responsible for a fatal result

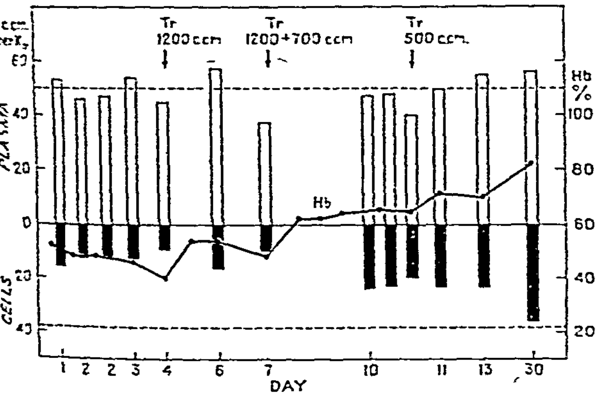


FIG 6 (case 7)—To illustrate treatment of a very severe case Two observations of blood volume are omitted as they were merely confirmatory of others

SUMMARY

This communication is the second instalment of a report on cases of severe hæmorrhage from the stomach and duodenum, studied in the Courtauld research wards of the Middlesex Hospital, in which blood-volume estimations were employed to obtain evidence of the severity of hæmorrhage and the time of its arrest Of the 147 cases studied up to the outbreak of war 73 were classed as serious, 39 as moderate, and 35 as mild There were 18 deaths Blood-transfusion is shown to be the most important factor in saving life in serious cases of hæmorrhage and criteria are suggested for its application which have materially reduced the fatal issues The avoidance of dehydration and the provision of a sufficient food intake is emphasised The general methods of treatment employed are described, together with illustrative cases

Apart from the estimations of hæmoglobin and cell- and plasma volume, nearly all the observations of a pathological or biochemical character have been made for us by colleagues in the Bland Sutton Institute of Pathology and the Courtauld Institute of Biochemistry, to whom we express our thanks We also record our gratitude for the enthusiastic coöperation of J W Todd and E W Hart, resident officers in the research wards.

REFERENCES

1 Meulengracht E *Brit med J* 1939, ii 321
2 Witts L J *Ibid* 1937, i 847
3 Jones F Avery, *Ibid*, 1939 i 332
4 Cruveilhier J *Arch gén de Méd* 1856, 7 442
5 Sippy B W *J Amer med Ass* 1915 64 1625
6 Crohn B B Affections of Stomach Philadelphia 1927
7 Hurst, A F and Ryle J A *Lancet* 1937 i 1
8 Cullinan E R. and Price, R K *St Bart s Hosp med Rep* 1932 65 185

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—On Wednesday, May 13, at 2 30 P M at Friends House, Euston Road, London N W 1, Dr Philip Hamill will speak on prescribing in war time

NUTRITION SOCIETY —A whole day conference on problems of collective feeding in war-time will be held at the London School of Hygiene, Keppel Street, W C 1, on May 30 at 11 A M

SPLINTAGE OF PERIPHERAL NERVE INJURIES

W. BREMNER HIGHET, M B N Z F R C S
FIRST ASSISTANT IN THE NUFFIELD DEPARTMENT OF ORTHOPÆDIC SURGERY (PERIPHERAL NERVE INJURY CENTRE) OXFORD

THE splintage of paralysed muscles after injury to a peripheral nerve is of the utmost importance and unfortunately the principles of splintage are on the whole poorly understood The reaction of muscle to denervation is well established The muscle loses all power of voluntary contraction, becomes atonic or flaccid and undergoes progressive atrophy; the fibres are in a state of fibrillation which continues perhaps for years until all contractile tissue has disintegrated and the muscle is replaced by fibrous tissue The stretching of a paralysed muscle is harmful because it accelerates disintegration of muscle-fibres and their replacement by fibrous tissue After re-innervation the functional recovery in a stretched muscle is poorer than in a muscle protected from stretching

PRINCIPLES OF SPLINTAGE

1 A paralysed muscle should be splinted in such a position that its point of origin is approximated to its point of insertion No paralysed muscle should be subjected to stretching by the action of gravity or by contraction of its antagonists Suitable splints should be applied as soon as possible after the nerve injury is recognised

2 Splintage of nerve injuries is *not* equivalent to immobilisation The necessity for prolonged and uninterrupted immobilisation for injury and disease of bone and joint has received universal recognition In uncomplicated peripheral nerve injuries there is no injury or disease of bone and joint—the joints are not liable to damage on movement The case is just the reverse, continued immobilisation in itself will lead to progressive stiffness and disability This is especially true of the joints of the digits Recovery after injuries of peripheral nerves should be estimated in terms of recovery of function of the affected limb Severe and permanent stiffness of joints can render almost valueless an excellent recovery in a peripheral nerve All joints of the paralysed limb must be allowed as full a range of movement as is compatible with the continuous relaxation of all paralysed muscles

3 The splint must not press or rub on any insensitive area of skin since this may lead to the development of trophic sores Moreover no part of the splint must cause constriction and so interfere with the circulation of the part

4 The splint should be of such a type that the patient can carry out occupational therapy and in some cases return to work while wearing his splint The splint should be removable in order that routine physiotherapy may be carried out

Detailed discussion of physiotherapy and occupational therapy is beyond the scope of this paper, but our scheme of treatment may be outlined as follows

Physiotherapy —The aim of physiotherapy is threefold—to improve the circulation of the part by massage and galvanic exercises, to diminish muscle wasting and fibrosis by galvanic exercises, to maintain the mobility of all joints by active exercises and passive movements It is our practice to remove all splints for two periods of half an hour each day During these periods massage is performed, every individual paralysed muscle is given a course of graduated galvanic exercises and *all* joints of the limb are put through a full range of passive movement This passive movement entails transient stretching of denervated muscles but it is our firm belief that transient stretching is beneficial in that it prevents muscle contracture Moreover even if transient stretching is harmful to denervated muscle the beneficial effect of passive movements in preserving joint mobility is much more important The preservation of joint mobility by passive movement is very important in all peripheral nerve injuries but particularly important in lesions of the brachial plexus

Occupational therapy is complementary to physiotherapy and must not be merely diversional There are three stages in occupational therapy In the stage of complete paralysis exercises are designed to preserve joint mobility and to maintain the function of non-paralysed muscles In the second stage of early motor recovery remedial exercises are designed to re educate the muscle in the resumption of its normal function

These five died from lack of blood Whether the final cause of death was anoxæmia or anhydræmia may have varied from case to case, but the fact emerges unmistakably that from the extent of the blood loss, from the lack of time available (which meant that not one of these cases was adequately transfused), and from the successful results in cases of equal severity who were transfused, some if not all of these patients would have lived if we could have replaced their blood in time Notes on three of these cases follow —

Case 2 —Male, aged 65 Three weeks history of melæna Hæmatemesis of 1 pint 8 hours before admission (17, iii, 36) Hæmoglobin on admission 21% Vp 3200 c cm Vc 500 c cm Routine medical treatment was begun and a slow drip transfusion started It was obvious from clinical and laboratory investigations that hæmorrhage was continuing After 12 hours this increased in volume and the patient died PM—Large chronic ulcer at pylorus

Case 3 —Female, aged 51 On day of admission (19, xi, 36) vomited a few ounces of blood When seen Hb 68%, BP 205/105 On fifth day Vp 2100 c cm, Vc 600 c cm Hb 54% Sudden collapse occurred Transfusion was started at once but patient died almost immediately PM—Multiple acute ulcers, evidence of only small recent hæmorrhage

Case 4 —Male, aged 53 Many years dyspepsia Hæmatemesis *5 days before admission (25, vi, 38) followed by* collapse on day previous to admission When seen was irrational and violent BP 120/45, Hb 17% Slow drip transfusion was started at once but in the next hour the patient became restless, leapt out of bed and died PM—Chronic duodenal ulcer, slight recent hæmorrhage only

If blood-transfusion could have been correctly applied in time it would have postponed death in each of these three cases In case 2 the cause of death was probably anoxæmia as full dilution of the blood had taken place In the second the evidence suggests that lack of circulating fluid was the prime factor since, had full dilution taken place, the Hb would have been 35–40% and not 68% In the third no time was available for blood-volume estimation Two of these cases represent mistakes in treatment which we did not appreciate until later work showed the true value of blood-volume estimation

After the unsuccessful treatment of case 3 we decided that in future a patient in whom one sudden hæmorrhage was likely to be fatal should be transfused The criteria learned from that case have been used and all patients admitted to the unit since that day have been transfused if their total Vc has fallen to 700 c cm or the Hb to 40%, provided that no contra-indication to transfusion was present Since then only two patients have died as a direct result of hæmorrhage One of these is already quoted (case 4 above), in the other a diagnosis of lobar pneumonia, later found to be incorrect, was considered to preclude transfusion

These observations have led us to believe that blood-transfusion, correctly applied, is the *most important single* factor in saving life in severe gastro-intestinal hæmorrhage

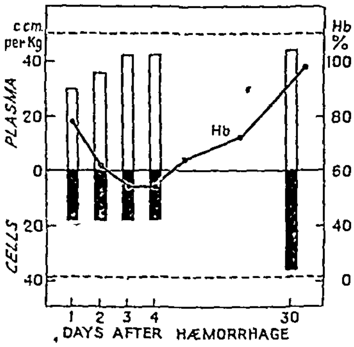


Fig 4 (case 5)—To illustrate occasional slow dilution after hæmorrhage The fixed Vc proves that hæmorrhage is arrested in spite of falling Hb

ILLUSTRATIVE CASES

Reference has already been made to a case early in our series where a relatively high Hb reading misled us into underestimating the degree of hæmorrhage when in fact the cell-volume was so low that transfusion was urgently required and the patient died The following case is complementary

Case 5 —Male aged 65 Periodic indigestion over several years and severe melæna during three days, on the last of which he had fainted on two occasions Admitted to a cottage hospital some twenty miles from London where melæna continued with slight hæmatemesis, sent to the Middlesex in an ambulance On admission Hb nearly 80%, estimation of Vc and total blood-volume showed hæmorrhage very severe and dilution incomplete Saline by rectum not fully retained, 2 oz of water by mouth hourly without further hæmatemesis Three days later dilution complete, reducing Hb to 52% but Vc being unchanged it was clear that hæmorrhage was arrested Complete recovery without transfusion or operation Blood-volume findings and Hb percentages in fig 4

The points to note in this case are (1) He was an elderly man with a long history of indigestion, he had, on admission, been bleeding on and off for several days and was perhaps still bleeding During the three days following admission the Hb level sank steadily These facts might have been used as strong reasons in favour of surgical intervention with or without transfusion (2) Blood-volume estimations established (*a*) that the hæmorrhage had been more severe than was indicated by the initial Hb level, (*b*) that the subsequent fall in Hb was indicative of dilution only, hæmorrhage had ceased (3) Transfusion was not employed because it was thought that the degree of hæmorrhage was not an immediate threat to life, and that transfusion might at that time increase the risk of further bleeding (4) On recovery no organic lesion could be demonstrated

Case 6 —Male, aged 32 No indigestion until fourteen days before admission when he had a large hæmatemesis On *admission Vc 31 c cm per kg, Hb 90%, condition good* Next day a further hæmatemesis, Vc had fallen to 20 and Hb to 62% showing continuance of bleeding On the third day (fig 5) Vc had fallen still further and a third hæmatemesis made condition very grave A drip blood transfusion of 1200 c cm was given very slowly with improvement in Vc and Hb percentage of a degree indicating complete retention of the blood Fluids, hitherto restricted, increased to 1 oz hourly Hb percentage maintained, although occult blood positive for fourteen days Convalescence in the fourth week Blood urea on admission 55, rising to 71 on the second and third days and falling to 36 on the sixth When convalescent a penetrating ulcer on lesser curvature demonstrated by X ray and gastroscopy

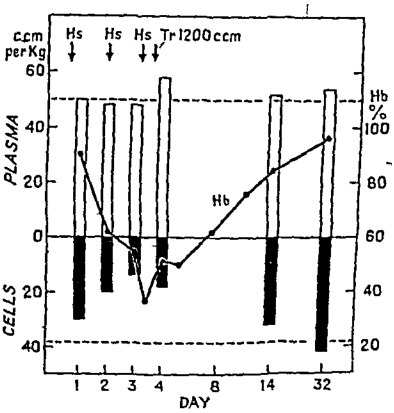


Fig 5 (case 6)—Mild case becoming severe with continued hæmatemesis

This case illustrates the conversion of a mild or moderate case into a severe one owing to continued hæmorrhage

Case 7 —Male, aged 56 Melæna for two days and small hæmatemesis on previous day On admission, somewhat collapsed, pulse 100 strong, BP 85/45 Not restless nor in pain Initial blood-volume estimation indicated, from height of the plasma, bleeding in progress for some time and dilution *complete* Vc of 16 placed case in medium group without indication for immediate transfusion Morphia injected, saline by rectum not well retained During first forty eight hours slight fall in Vc and Hb indicating hæmorrhage still in progress Pulse between 90 and 104 Towards midnight on third day Vc fell reaching the danger point of 9 Slow drip blood transfusion, 1200 c cm in all, over a period of *twenty four hours*, Hb rising above 50 and Vc to 16 Pulse fell to 80 for a few hours Following day pulse rose to 120, patient restless On seventh day Vc again in the danger area and Hb fallen to 50% Several large melæna stools Blood urea, over 90 on admission, fallen to 80 and to 65 Diluted milk and water in feeds of 4–6 oz had been given two hourly from third day Although Hb well above previous lowest condition judged more dangerous owing to prolonged exsanguination Drip blood-transfusion, 60 drops per min and slowed down to 40 after two hours and to 20 *after four* hours, continued forty eight hours, 1900 c cm in all By 9th day condition better, pulse 110, occasional slight vomit and melæna stools On tenth night slight fall in Vc although Hb above 60 Vp *abnormally low*, showing severe dehydration, little urine passed Slow drip blood transfusion 500 c cm followed by saline 800 c cm Constant loose melæna stools

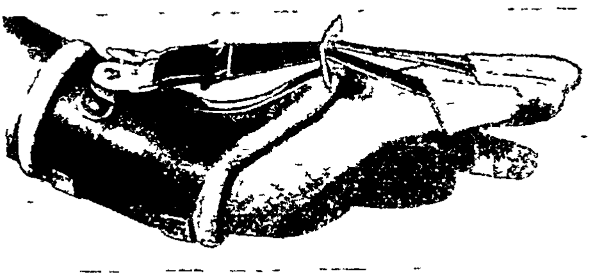


FIG 4—Splint for radial paralysis without anterior cock up in the palm

ulnar paralysis or even in normal subjects by faradic stimulation of the muscle We have employed a "knuckle-duster" splint for ulnar paralysis (fig 2) We thought this splint original but later found that a similar appliance made of plaster-of-paris had been described by Kendall and Kendall[1] in their excellent monograph on poliomyelitis This splint holds the metacarpophalangeal joints in slight flexion, relaxes the interossei and lumbricals and prevents clawing of the 4th and 5th digits (The splint has been employed for over twelve months and we have not seen the development of main-en griffe deformity in any case where it was applied soon after the injury) The splint is removable The bar across the palm takes the form of a removable metal rod covered with a spindle of 'Sorbo' rubber so shaped that the normal concavity of the palm is preserved The splint may be worn over a glove if desired

Almost all cases of ulnar palsy referred to us have shown a fixed main-en-griffe A fixed deformity in ulnar paralysis is absolutely unpardonable If treatment is carried out correctly there should be a full range of passive movement in the metacarpophalangeal and interphalangeal joints of the 4th and 5th as well as in the other digits Once a contracture has developed in the interphalangeal joints of the 4th and 5th digits treatment is in most cases unavailing—there is a persistent deformity directly attributable to inadequate splintage and independent of the nature of recovery in the injured ulnar nerve A light plaster-of-paris splint as described by Kendall and Kendall should be applied in all cases until the metal splint is available

RADIAL PALSY

In radial palsy the dorsiflexors of the wrist and dorsiflexors of the metacarpophalangeal joints and the extensors of the thumb are paralysed and must be protected from over-stretching We have employed the splint recommended by the Medical Research Council after the last war[2] (fig 3), and in some cases have modified it in minor respects It is occasionally of advantage to discard the metal cock-up splint in the palm and maintain dorsiflexion of the wrist by stiffening of the dorsal portion of the splint (fig 4) In radial palsy it is unnecessary to splint the interphalangeal joints in extension since the interossei and lumbricals are intact and can carry out powerful extension at these joints However from a practical standpoint it is difficult to devise an elastic splint which secures extension at the metacarpophalangeal joints alone While the elastic splint is being made, or if for any reason such as immobilisation of the limb in plaster for fracture of the humerus it cannot be fitted, a temporary plaster splint may be applied The plaster should hold the wrist in dorsiflexion, the thumb in radial abduction and extension, and the metacarpophalangeal joints of the fingers in extension—the plaster should on no account extend beyond the proximal phalanges to immobilise the interphalangeal joints There is one type of splint the use of which is criminal—the full length cock-up splint for radial paralysis immobilising the wrist and all the digits in complete extension Several cases have been referred to us after immobilisation in this type of splint The stiffness of the wrist and digits has been deplorable Even after months of strenuous physiotherapy the joint stiffness has not been fully overcome and in consequence there is severe disability directly attributable to the faulty splintage and quite independent of the damage to the radial nerve

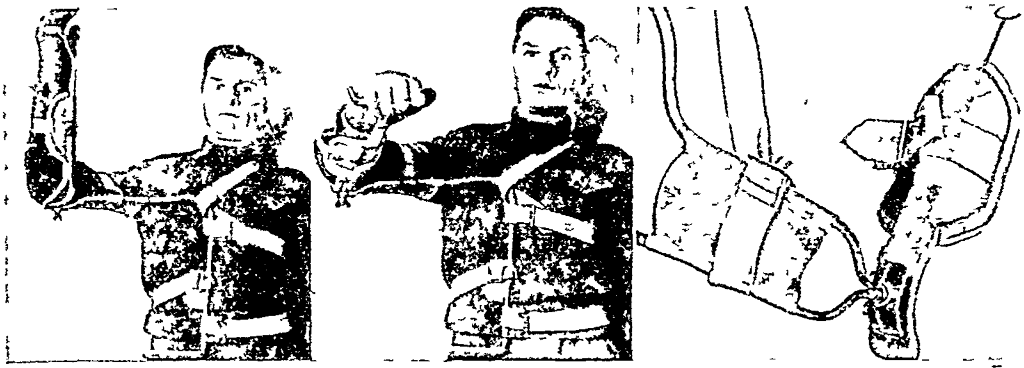


FIG 5—Shoulder abduction splint for lesions of the upper trunk of the brachial plexus On right, details of joint at elbow, which permits various positions at the elbow joint and variable rotation at the shoulder

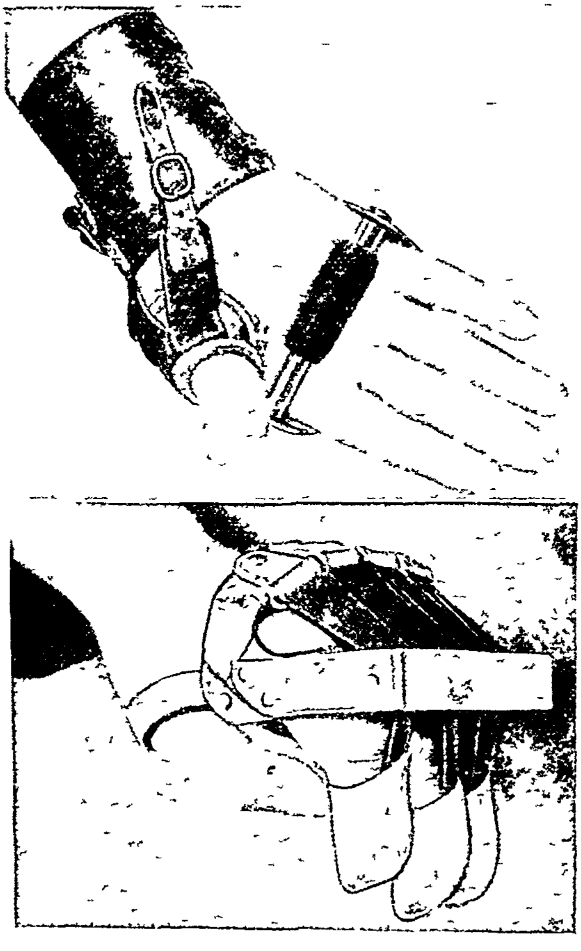


FIG 6—Above, combined median and ulnar splint Below combined median and ulnar splint with elastic extensors to the fingers

---

[1] Kendall H O and Kendall, F P *Publ Hlth Bull*, *Wash* 1939, No 242

[2] *Spec Rep Ser med Res Coun*, *Lond* 1920, No 54

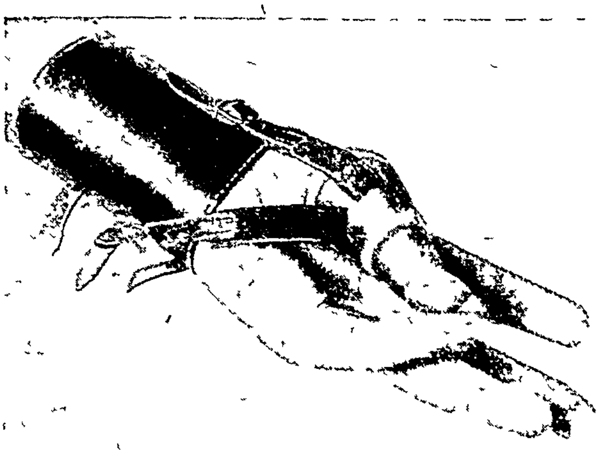


FIG 1—Splint for median paralysis, the cuff for the thumb is made of moulded leather, the proximal edge being everted

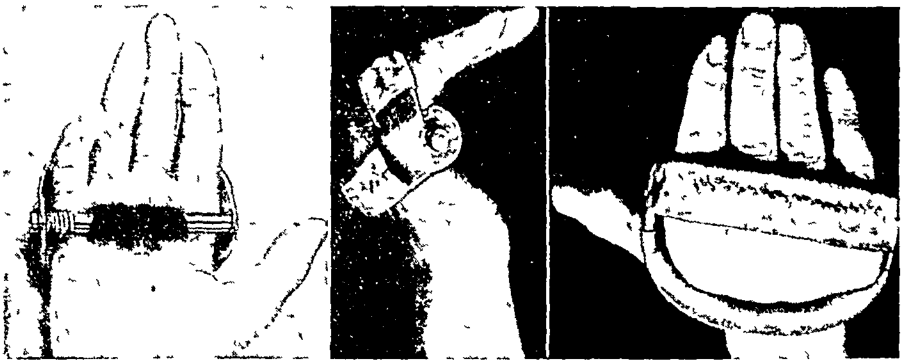


FIG 2—“ Knuckle duster ” splint for ulnar paralysis.

Every precaution must be taken to prevent overtiring and exercises should first be performed on a plane eliminating the action of gravity It may be noted that most of our splints are so designed that the patient may carry out occupational therapy while wearing his splint In the third stage where the muscles show advanced recovery strenuous remedial exercises are designed to improve muscle coordination, to improve synergic action, and most important of all to improve dissociated movements of a group of paralysed muscles At this stage of recovery the patient is usually able to abandon his splint

One further point deserves consideration A paralysed limb has a poor circulation and is colder than normal and must be kept warm Except in hot weather hands must be protected from the cold by warm gloves which may be worn over or beneath the splint

MEDIAN PALSY

It has often been stated that no splint is necessary in a case of median palsy We disagree entirely with this view In median paralysis the abductor brevis and opponens pollicis are paralysed (flexor brevis pollicis may be paralysed but is usually active by virtue of a double innervation by the ulnar and median nerves) The movements of palmar abduction and opposition of the thumb are lost and the thumb lies in a position of adduction Without splintage the paralysed muscles are stretched and an adduction contracture of the thumb is almost inevitable It has been recommended that a strip of adhesive should be applied from the thumb to the ulnar side of the hand This practice is even worse than no splint at all since although a certain amount of rotation of the thumb is thereby produced the adduction deformity is increased An adduction contracture prevents active or passive opposition of the tip of the thumb to the finger tips Numerous experiments were made before a good median splint was devised the elastic splint illustrated in fig 1 is the result of these experiments The thumb is held in a position of palmar abduction and opposition by means of two strips of elastic fitted to a leather cuff at the wrist and attached distally to a cylinder of moulded leather fitting over the metacarpophalangeal joint The moulded leather cylinder is made from a plaster cast of the thumb Patients are advised to move the thumb as much as possible and to practise opposition of the thumb to the finger tips

ULNAR PALSY

In ulnar palsy the characteristic deformity is clawing of the 4th and 5th digits This deformity is disabling and unsightly but can be prevented by adequate and early splintage The form of splint is based on an appreciation of the function of the interossei, lumbricals and extensor communis digitorum in movements of the fingers The interossei and lumbricals have a similar action in bringing about flexion at the metacarpophalangeal joints and extension at the interphalangeal joints The extensor communis digitorum brings about extension at the metacarpophalangeal joints but also at the interphalangeal joints Its action on the interphalangeal joints is most powerful when the metacarpophalangeal joints are flexed and is lost when the metacarpophalangeal joints are hyperextended

In paralysis of the ulnar intrinsics the extensor communis brings about hyperextension at the metacarpophalangeal joints and the interphalangeal joints are held flexed by the long flexor tendons (this clawing is accentuated if the ulnar slips of flexor profundus digitorum are active) However, if the metacarpophalangeal joints are held in a position of slight flexion the extensor communis digitorum can bring about powerful active extension at the interphalangeal joints and clawing may be prevented This action of extensor communis digitorum is not generally recognised, but may easily be demonstrated in cases of ulnar or combined median and

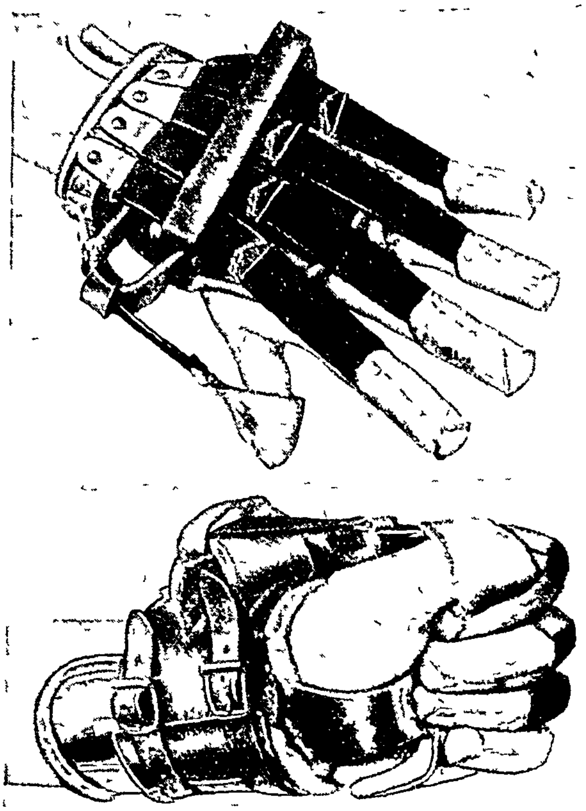


FIG 3—Splint for radial paralysis

growth Hot sterile 'Vaseline' was run on to the surface to a depth of ¼–½ in to exclude air The tube was then incubated at 37° C After incubation for about 60 hours acne bacilli were perceptible, and there was a copious growth in 4 days This method was followed in a number of cases as a routine, and in all a pure primary growth of acne bacilli was obtained in penicillin glucose broth, whereas in glucose broth without penicillin the staphylococci when present outgrew the acne bacilli and usually inhibited their growth

Results obtained are shown in table I

TABLE I—CULTURES OBTAINED FROM ACNE LESIONS IN GLUCOSE BROTH WITH AND WITHOUT PENICILLIN

Source	No of samples	With penicillin, No giving pure acne bacillus	Without penicillin, No growing staphylococci
Acne pustules	22	22	18
Comedones and sebum from skin of nose	25	25	16

This procedure requires no special apparatus, and enables autogenous vaccines of the acne bacillus to be prepared in 3–4 days after the material has been collected Such vaccines also can be made from the primary cultures, so that changes in antigenic structure due to cultivation on artificial medium are reduced to a minimum The penicillin used was a simple filtrate of *Penicillium notatum*, and, since the concentration of the antibacterial active principle in such filtrates is not always the same, it is not possible to give a definite dilution of the penicillin which will stop the growth of staphylococci without interfering with the growth of the acne bacillus The penicillin used must have been previously titrated against staphylococcus and the concentration used in glucose broth should be twice that which completely inhibits staphylococcal growth

TYPES OF ACNE BACILLUS

When the primary cultures of acne bacilli were plated anaerobically two types of colony were noted Type I gave a large heaped-up colony which had a yellowish buff colour and on blood agar was surrounded with a large zone of hæmolysis The individual bacilli were short, thick, irregular in shape, and often clubbed Type II gave small flat colonies and the individual bacilli were longer, thinner and often curved These two types often occurred together in the same specimen of pus, but in 8 cases out of 24 only type II was present In the indolent pustules often seen in some cases of acne type II is usually found in pure culture The sugar reactions were not quite constant, but in most cases both types fermented glucose, saccharose and glycerin, while type I also fermented maltose

Rabbits were immunised with the two types of acne bacillus and the agglutination reactions of these immune rabbits were tested against cultures of the different types (table II)

TABLE II—AGGLUTINATION OF DIFFERENT TYPES OF ACNE BACILLUS WITH IMMUNE RABBIT SERUM

Type of serum	Type of bacillus	Dilutions of serum							
		1/10	1/100	1/200	1/400	1/600	1/800	1/1000	Control
I	I	+	+	+	+	+	±	0	0
	II	0	0	0	0	0	0	-0	0
II	I	0	0	0	0	0	0	0	0
	II	+	+	+	+	±	0	0	0

The tests show that the two types of acne bacillus are antigenically distinct

SUMMARY

Pure cultures of acne bacilli were obtained from 47 specimens of acne material in glucose broth containing penicillin in double the concentration which inhibited staphylococcal growth

Two types of colony of acne bacillus were noted

These two types were antigenically distinct

I am indebted to Prof Alexander Fleming for his help

Medical Societies

ROYAL SOCIETY OF MEDICINE

AT a meeting of the section of State Medicine on April 24, with Dr E H R HARRIES, the president, in the chair, a discussion on the

Future of Public Health Nursing

was opened by Miss M E FLAMBERT, deputy chief nursing officer to the Ministry of Health Public health nursing, she said, depends on the future development of the medical and social services The term covers health visiting, midwifery, and district, school and industrial nursing All these services have grown with the growth of maternity and child welfare work Today most health visitors are general-trained nurses with a midwifery qualification who have taken a health visitor's course and have thus spent some 4½–5½ years in preparation for their career She doubted whether general training at present is sufficiently comprehensive it should contain more of the fundamentals of public health nursing At present comprehensive service is being given by those district nurses who are also doing midwifery and health visiting All Queen's nurses, for example, are state registered and must take a six months' course in district nursing Many nurses, however, are unable to afford a health visitor's course before undertaking district nursing and are thus not able to make full use of a fine opportunity for teaching hygiene Much health visiting still falls on voluntary organisations and in many districts these organisations cannot afford fully trained women, but employ nurse-midwives who have had 2 years' training in midwifery without a nursing qualification The number of Queen's nurses employed, however, is steadily increasing although it is still an open question whether one nurse should combine the duties of health visitor, midwife and district nurse, or whether the work should be divided among specialists Miss Flambert felt that people must become much more health-conscious before they will readily tolerate more than one visitor A medical officer of health had told her that he had tried both methods, and that though the single visitor was more acceptable to the public a service of specialist nurses was easier to administer The aim in training women for public health nursing must be to educate them in preventive medicine As it stands district nursing does not necessarily attract the women most fitted for it but rather those who wish to escape from the petty restrictions of hospital life More must be done to improve standards in public health work and so to attract the right type of girl Those entering at present have their outlook focused on the care of the sick Matrons and sister tutors could do much, she thinks, to shift the emphasis to preventive work The scope of school nursing could be extended, and she would like to see all health teaching in schools given by trained public health nurses who have been taught to teach The prospects of promotion should also be greater better candidates will be attracted if there is a ladder to climb Thus there should be more posts for superintendent health visitors, she considers, and more non-medical supervisors of midwives Many feel that the combined post of superintendent of midwives and health visitors should be abolished because it excludes able women who have only specialised in one branch Industrial nursing is a branch of public health nursing which has grown rapidly in 1939 there were 1500 industrial nurses, and this number is believed to have been trebled in the last 2½ years; and industrial nurses can give much health teaching to workers in factories

AMERICAN EXPERIENCE

Miss E C PHILLIPS, associate chief nurse in the American Red Cross, serving with the Harvard Field Unit, said that public health nursing in America has had an erratic childhood, labouring under three difficulties the job has never been defined, there have been too few nurses to carry it out, and the preparation of the nurse has not kept pace with her developing opportunities Before the last war, growth was sporadic, but in 1912 the National Organisation for Public Health Nursing was established, with the aim of improving performance At the beginning of the century there

BRACHIAL PLEXUS PALSY

In lesions of the lower trunk of the brachial plexus the paralysis involves chiefly the intrinsic muscles of the hand—a combined median and ulnar splint is required In lesions of the upper trunk of the plexus the paralysis involves the deltoid, spinati, flexors of the elbow and supinators of the forearm The ordinary abduction splint may be satisfactory for isolated paralysis of the deltoid but in lesions of the upper trunk of the plexus it is insufficient The limb must be splinted in a position of abduction and external rotation of the shoulder, flexion of the elbow and supination of the forearm In combined lesions of the upper and middle trunks of the plexus there is in addition a radial paralysis for which a radial splint is necessary

Many cases of brachial plexus paralysis referred to this centre have arrived with "frozen" shoulders and elbows owing to excessive immobilisation on a simple abduction splint When the splint is removed the arm remains fixed in mid-air, there is usually no range of passive external rotation at the shoulder, the elbow shows only a few degrees of passive movement, there is a pronation contracture of the forearm, and often the wrist and fingers are stiffened in extension Only with great difficulty is stiffness of this severity correctable by physiotherapy or manipulation If the splinting and physiotherapy is correct it need not occur The shoulder abduction splint incorrectly employed is just as pernicious in its effects as a full length cock-up splint

We have employed the splint shown in fig 5 By means of a simple universal screw at the elbow the following movements are possible—flexion and extension of the elbow, pronation and supination of the forearm, and internal and external rotation at the shoulder

SCIATIC PALSY

Splintage of sciatic paralysis (lateral popliteal or combined lateral and medial popliteal paralysis) is usually satisfactory While in bed the patient must wear a firm plaster back splint to maintain dorsiflexion of the foot, while up and about he must wear side irons and a toe-raising spring T-straps are added as required The side toe-raising spring is preferable to the central spring and the iron should be hinged at the level of the ankle or if cost is an important consideration the socket in the heel should be round In cases of medial popliteal palsy it is very important to make sure that the inner surface of the boot is quite smooth—friction over areas of roughness may produce intractable trophic sores of the sole Several cases of sciatic palsy referred to us had been fitted with an appliance with flat heel sockets which allowed *of no movement at the ankle-joint* These cases showed disabling stiffness of the ankle

COMBINED INJURIES

Combinations of peripheral nerve injuries may be splinted by modifications of the various appliances described

In *combined median and ulnar palsy* one must pay attention to both ulnar and median intrinsic muscles In cases where the long flexor tendons are active the clawing of the fingers is severe and disabling and the clawing affects all fingers because of paralysis of all lumbrical muscles as well as of the interossei We have employed a combination of the median and ulnar splint and have found it very satisfactory (fig 6, above) In *cases of complete paralysis of the intrinsic muscles* the hand is virtually useless owing to clawing, even though there be no fixed deformity Adequate splintage greatly increases the usefulness of the hand One of our patients has been able to return to his occupation as a hairdresser and finds that while wearing the splint he can make excellent use of his hand, in spite of complete paralysis of the intrinsic muscles of the hand In two cases of combined median and ulnar palsy where early splintage had been neglected we found that on application of the splint the extensor communis was incapable of causing active extension at the interphalangeal joints Originally both patients had a radial palsy but the extensor communis had recovered by the time the patients were referred to us We could only assume that through lack of splinting the common extensor tendons had been subjected to over-stretching, thus preventing their proper action In both cases we applied the type of splint shown in fig 6 (below) Elastic extensions were applied to the ulnar splint to prevent clawing of the fingers

Combined median and radial paralysis may be splinted by the appliance shown in fig 7

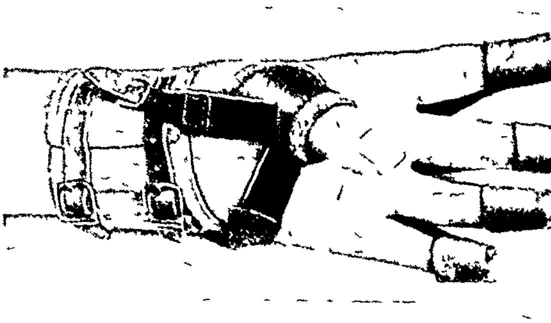


FIG 7—Combined median and radial splint

CONCLUSIONS

Careful splinting is of the utmost importance in peripheral nerve injuries, in order to prevent stretching of paralysed muscles, stiffness of joints and soft tissue contractures

Splints must be applied as soon as possible after the injury

No splintage is better than improper splintage

The types of splint employed at the Peripheral Nerve Injury Centre at Oxford are described

The splints illustrated were made at my instigation by Mr G W Baker of the Wingfield-Morris workshops I am deeply grateful to him for his suggestions

---

USE OF PENICILLIN
IN CULTIVATION OF THE ACNE BACILLUS

STUART CRADDOCK, M B LOND

(Laboratories of Inoculation Department, St Mary's Hospital)

THE acne bacillus is usually isolated from acne lesions by *anaerobic cultivation on* glucose agar, blood agar, or some other suitable culture medium In this way it is obtained occasionally in pure culture, but more often as a mixture with *Staphylococcus albus* In pure culture the acne bacillus grows well in glucose broth (preferably with a pH adjusted to 6 8) Fleming[1] in 1929 showed that penicillin had a specific bacteriostatic effect on certain bacteria, and that this action was more pronounced on staphylococci than on diphtheroid bacilli As the acne bacillus is of the diphtheroid group, observations were made to see if this bacillus also was less sensitive to the bacteriostatic action of penicillin than was the staphylococcus In the first experiment pus from an acne pustule which contained both acne bacilli and staphylococci was planted in a series of glucose-broth tubes containing increasing dilutions of penicillin These were incubated anaerobically for 4 days with the following result

	Concentration of penicillin						
	1/10	1/100	1/200	1/300	1/400	1/600	Control
Acne bacillus	0	+	+	+	+	0	0
Staphylococcus	0	0	0	0	0	+	+

In the concentration of 1/600 and in the control staphylococci grew abundantly in 48 hours, and this heavy growth inhibited acne bacilli

This showed that the acne bacillus was less sensitive than the staphylococcus to penicillin, and that by using a concentration of penicillin which inhibited staphylococci a pure culture of acne bacilli can be obtained direct from an acne lesion As a result of this observation, experiments were made to find the simplest method of obtaining primary pure cultures from acne lesions whether or not they contained staphylococci as well as acne bacilli

Method—A tube of glucose broth (pH 6 8) was boiled to expel dissolved gases When this had cooled sufficiently it was inoculated with pus from an acne lesion Penicillin was then added so that the broth contained a concentration twice as great as had been previously shown to inhibit staphylococcal out that the break up of family life brought about by the war had led people to depend more on the public services, and this was a great opportunity for the public health nurse

---

[1] Fleming, A *Brit J exp Path* 1929, 10, 226

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES

Compulsory Powers

AT a meeting of this society in London on April 25, with Colonel L W **HARRISON**, F R C P , the president in the chair, a discussion on the need for further powers to deal with sources of infection contacts and defaulters was opened by Major S M **LAIRD**, R A M C In describing existing legislation he pointed out that any person is free to have VD and to communicate it as much as he chooses , he is not obliged to be treated or to continue treatment until cured or rendered non-infectious , he is under no legal obligation to assist in tracing his infective consort and the latter is free to refuse examination and treatment In the absence of notification no accurate knowledge of the incidence of these diseases exists He emphasised the diagnostic difficulties in female gonorrhœa and the need for a greater index of suspicion on the part of the medical profession The control of infection requires a knowledge of the causative organism, the method of spread, efficient diagnosis and treatment of the individual case, and the discovery of the source of infection and all other contacts In relation to gonorrhœa and syphilis the first two requirements are fully met , the third may fail in practice from diagnostic delay or inadequate treatment , but the fourth requirement is infrequently met in this country Control is sabotaged in this country by three factors the technical imperfections of the medical profession , the defaulting patient , and the untraced source of infection and contacts Failure to suspect and diagnose VD contributes to the lack of success in the control of these diseases, and Major Laird suggested that they should only be dealt with by practitioners who have successfully passed through postgraduate instruction in this specialty A patient may default before the completion of treatment or he may cease to attend after treatment but before cure can be pronounced The latter imperils his future health , the former, in addition, imperils the public health Both categories are important , the inadequately treated patient may be incapacitated by the later complications of VD and, with his dependents, become liabilities to the state , the infectious defaulter, particularly if a woman, may infect others of the same and the next generation The defaulter-rate is high in this country , in England in 1935 only 17 5% of patients at the treatment centres completed treatment and tests of cure The corresponding figure for Sweden was 97 5% Factors encouraging defaulting are manifold and many are avoidable The defaulter-rate can be lowered by attention to such factors as suitable clinic hours, a sympathetic and skilful staff, taking trouble to establish and maintain a close understanding and harmony between patient and clinic officer, and the services of an almoner Some defaulters may be brought back by a suitable written reminder or by a call from a health visitor In spite of attention to all these points a certain hard core persists which would only be controlled by the threat or actual use of compulsion The position with regard to sources of infection and contacts is still worse, and Major Laird submitted that the methods of control in use in this country are not satisfactory He thought it significant that the New York Commission which in 1936 studied the antivenereal measures employed in Britain and the Scandinavian countries reported in favour of the compulsory powers in use in Scandinavia The Swedish law of 1918, under which the present antivenereal measures are carried on, applies to syphilis, gonorrhœa and soft sore in an infectious form It provides for confidential notification , compulsory treatment and obedience to instructions calculated to prevent the infection of others , ascertainment of the source of infection and the compulsory examination and treatment of the source , a comprehensive mechanism for dealing with defaulters , compulsory removal to hospital of patients who might otherwise cause other persons to become infected, and of defaulters and sources of infection who fail to carry out the instructions of the inspector of health The order for removal to hospital is normally issued by the health authority, against whose decision there is a right of appeal to higher authority The decision already given must be observed until countermanded by higher authority A doctor who fails in any of his statutory duties is liable to a fine Major Laird then quoted from the British Mission's Report (H M Stationery Office, No 83, 1938) to indicate that the Swedish measures do not lead to concealment or malicious complaint and are well received by the people Persons called on to undergo medical examination seldom raise objection and appeals are rare The mission was told by the Swedish doctors that it was of assistance to have the penal provisions of the law behind them, but that it was rarely necessary to use them The rates per 10,000 of the population for primary and secondary syphilis in 1935 were Stockholm, 1 8 , the rest of Sweden, 0 57 , and all Sweden, 0 67 The rates in 1935 were respectively 4 1%, 7 5% and 6 6% of the rates for 1919 Major Laird emphasised that Stockholm, in spite of density of population and a high proportion of imported infections (31 7% of all early syphilis in males), had a rate similar to that of the whole of England and Wales The number of cases of all stages of acquired and congenital syphilis reporting for the first time in Stockholm in 1935 was 5% of what it was in 1919 In Liverpool the corresponding total in 1935 was 37% of the 1919 total Sweden has far outstripped this country in reducing the incidence of congenital syphilis Major Laird concluded that compulsory powers have contributed to the success of the Swedish antivenereal measures and was of the opinion that the Minister of Health should arrange, without delay, for a survey of the VD problem in this country with a view to the trial of notification and compulsory measures Notification must be by number only unless and until the patient defaults, and compulsory measures must be applied without discrimination to both sexes and all sections of the community He emphasised the need for intensive education of the public and thought it time that the man in the street was told the truth about VD in this country , otherwise he could not be expected to cooperate in solving the problem The medical profession require further education especially in the epidemiological aspects of VD, and expert legal and political advice must be sought in drafting the necessary measures He urged the Government to avoid complacency

Dr E W **ASSINDER** (Birmingham) said he had never understood why the venereal diseases were not on the list of notifiable infectious diseases , he was in favour of notification and compulsory powers

Dr A M **STUART** (Portsmouth) emphasised the need for education of the medical profession and mentioned that home-visiting of defaulters by health visitors had recently been introduced in Portsmouth

Dr J L **BURN** (Barnsley) described the results achieved by home visiting in Barnsley and Salford and reminded the meeting that Salford some years ago asked for a local trial of compulsion

Mrs **NEVILLE-ROLFE** (secretary-general, British Social Hygiene Council) attributed the greater success of the Swedish measures to the better undergraduate and postgraduate training of the doctors treating VD in that country and to the education of the school-children in social hygiene including VD She asked for the more thorough application of the voluntary method, and in particular for more adequate facilities for diagnosis and treatment, especially for women working in industry She urged the setting up of ailments-of-women clinics to attract cases which would not attend the ad-hoc clinic She agreed that compulsion would often be necessary to control the professional prostitute and the regularly promiscuous girl and that these two categories would require adequate inpatient treatment facilities

Dr W G **BOOTH** (Boston, Lincs) had found that a demand for more effective control already existed among the laity, particularly among the council members of local authorities He was impressed by the case for compulsion

Dr **ROBERT FORGAN** (Central Council for Health Education), who said he expressed the views of the Scottish committee of the society in addition to his own, mentioned previous Scottish attempts to promote legislation and asked why the compulsion used in the Services should not also be applied to the civilian population were only 130 public health nurses in the United States, employed by 58 agencies, by 1920 the number had increased to 9000, employed by 4000 agencies, and in the last 20 years the figure has increased to 24,000, employed by 6000 agencies Yet the figure of one to every 2000 population, set up by the American Public Health Association, would require a total of 65,000 public health nurses today, and only one state has so far approached it The average at present is one nurse to 7000 population The federal government hopes to add 10,000 new public health nurses to the field in the coming year About £312,000 last year and probably about £500,000 this year is being allotted by Congress to nursing, and will chiefly be spent on expanding undergraduate and graduate courses A typical plan for training public health nurses is designed for graduates of approved schools of nursing who qualify for a university course They spend 4 months on a combined programme of college and field work, and receive an allowance of about £112 to cover tuition and maintenance In return each nurse agrees to give two years service on a minimum salary as a junior public health nurse, and to complete a year's programme of study in public health nursing Basic courses for all nurses in the better schools already include pædiatric nursing, care of children with orthopædic and cardiac conditions, and experience at nursery schools when possible, and efforts are made to develop in the student a deep appreciation of the social and health aspect of nursing The public health nurse works under four kinds of organisation official agencies, non-official or voluntary agencies, boards of education, and commercial companies In 1941, about 4% of the 23,533 public health nurses were in State agencies, 41% in local health departments, 25% under non-official agencies, 15% under boards of education and 15% in industrial companies The numbers have grown most rapidly in the factories, increasing by more than a third in the last 5 years Americans, she said, believed that the goal of public health nursing was a comprehensive community programme, to be achieved by representatives of all the agencies sitting round a table and planning together, it will then probably become clear that fewer agencies are needed The public health nurse can give adequate care to the whole family She works under a doctor who may be the private doctor of the patient, or the doctor at the health department, hospital, school or factory If she finds a patient not under medical care she gets him under the doctor She is primarily an educator Scholarships and grants fit her for the task, in 1941, 62% of all supervising nurses had had a year or more of public health education and over a third of them held university degrees Though the service is still fluid, eight trends can now be recognised bedside nursing is becoming a part of programmes where it never was before, teaching given by the public health nurse is accompanied by practical demonstration, the family is being recognised as a unit for health care; the school nurse is working more with the teachers than directly with the children, the preschool, adolescent and senescent years are receiving more attention, the care of the chronically ill is being improved, emphasis is being placed on those aspects of the public health work which require great nursing skill, such as the care of the premature, the pneumonia patient or the child with cardiac disease, and industry is using public health nurses, not only in factories but in the homes of the workers The leaders of public health nursing are helping to recruit and select the right kind of girls as students for schools of nursing

AND IN THE DOMINIONS

Miss I S Hawkins explained that in New Zealand the population was only 3,000,000, and there were no real, though some potential, slums The problem, she said, is how to cover the scattered population economically and efficiently She believed that the housewife should have some say about the number of visitors calling on her, we help her most by giving her one sound friend and adviser, rather than several specialists The Plunket nursing service, founded by Truby King, has reduced the New Zealand infant mortality from 75 to 30 per 1000 The hospitals are not elaborately equipped, but are made to approximate to the average home so that the nurse can teach the mother to handle properly the materials she will be using on her discharge New Zealand is the only country in the Empire where the natives are accepted as the equals of the whites The Maori are a fine race with whom fitness and strength were almost a religion before white settlers came They have received the advantage of easier living, and with it the disadvantages of tuberculosis and dental caries For a time they seemed to be a dying race, in consequence, but now, thanks to public health measures, their numbers are slowly increasing again They are intensely superstitious, and a man dying in hospital with tuberculosis is always taken back to expire among his friends, so that infection is kept alight Yet it would be a mistake to be highhanded with them their mistrust and fear is slowly being overcome by public health teaching. Over here, where everyone is working hard and wanting to keep fit, and where we have had practical demonstration, in the shelters, of the importance of drainage and sanitation, now is the time, she believes, to instil ideals of public health

Miss Eleanor Jones described the three years university course in combined hospital and public health nursing given at the Toronto School of Nursing, of which she is a graduate Those entering are aged 19, must have had a secondary school education with a good grounding in science The first year is spent in the study of the principles of public health nursing and preventive medicine and in laboratory work the remaining two years are spent in hospital doing bedside nursing, during the third year the student also undertakes social case work, child hygiene and field work Only six classes have graduated so far, but all the graduates hold responsible positions

OUTLOOK AT HOME

Dr Nicolas Gebbie, medical officer of health to Hull, said that the forerunner of the public health nurse was the female sanitary inspector, who did pioneer work in supervising the health of women and girls in factories The activities of public health nurses began in 1906–07, and it says much for the tact of the pioneers that the nurse has become a welcome visitor and that knock-knees and bow-legs have gone out The school nurse, known affectionately as the "nit nurse," resolutely tries to raise the standard of cleanliness, and the midwife plays her own important part The public health nurse should have a sound general training including experience in the care of the chronic sick She should be essentially a teacher, and should have, he considered, the same standard of education as teachers in elementary schools At Hull, the public health course for nurses lasts a year Enrolments should be sufficient to attract the best in the profession, there is no shortage of health visitors, he said, in places which offer a minimum salary of over £200 and a maximum of over £250 As to the retiring age, 60 is old enough, in his view, for anyone to be bicycling about in all weathers Refresher courses should be provided and the amenities and rewards offered to the public health nurse should be commensurate with the importance of her work to the nation

Sir Wilson Jameson agreed that it is impossible to attract the right women unless they can be given a decent status The new section of nursing in the Ministry of Health has the same status as any medical section in the department He believes that it is better for one nurse to be responsible for the health of the family, and this can possibly be done by extending the service of Queen's district nurses who have had public health training Miss Russell's school in Toronto, described by Miss Jones, shows what can be done, her nurses are trained as students, and not made use of as cheap nurses for hospitals

Dr J A H Brincker spoke of the international course in social science which has been successful at Bedford College He thought the education in hygiene of children in elementary schools could be improved —Dr T O Garland said that in nursing, as in medicine, the emphasis during training was largely on the treatment of the sick This bias will remain until the early associations of the student are with the influence of s[illegible] conditions on health —Miss G E Stephens [illegible] a Royal College of Nursing survey which shows that 50% of nurses in a northern city are doing public health work, in the country as a whole the figure is about 14% —Sir Weldon Dalrymple-Champneys pointed

THE LANCET

LONDON SATURDAY, MAY 9, 1942

THE ROUGH STUFF

One can sympathise with the practitioner who puts other questions about national bread before asking about its calcium content These days he is increasingly interested in promoting health as well as obstructing disease, but he has patients in his waiting-room who will want to know whether the new bread will upset their insides and interfere with the treatment prescribed There have been pronouncements ex cathedra about this But do they carry conviction? Not altogether, judging by the searchings of heart which are still going on among practitioners Half the trouble has been in the nomenclature of the new flour Some speak of it as wholemeal, which it certainly is not, others as wheatmeal, which is technically correct, but too likely to be confused with wholemeal to be a safe name for general use National is the name to be preferred, and looks like ousting its rivals A glance at the composition of the new 85% flour may help to settle some of the doubts By definition the flour should contain a minimum of bran, but a maximum of germ The fibre increase over white bread will be very small and the extra will probably do no harm to patients with gastric and duodenal ulcers It is most unlikely to affect adversely either spastic colon or ulcerative colitis, and it should certainly be given fair trial in these cases, for it has advantages over white bread in its vitamin content which may well outweigh possible disadvantages What about gout? White bread can be regarded as a purine-free food Not so the 85% flour, which contains all the germ of the wheat, and therefore must give rise to appreciable amounts of uric acid during metabolism Whether this will matter remains to be seen We know so little about the true pathology of gout that it would be folly to clamour now for the special production of a white loaf which may after all be unnecessary The national loaf has come As medical men, it is up to us to support it until we have convinced ourselves by honest experiment that it is for some purposes not so satisfactory as the old white Then, if we speak, we can speak with conviction, and the Ministry of Food will no doubt do its best to meet our demands

BLEEDING PEPTIC ULCER

Ligature or pressure on the bleeding point is the normal way of dealing with hæmorrhage which does not stop of itself, but it has long been the custom of most physicians and surgeons to avoid surgical intervention for hæmorrhage from gastric or duodenal ulcers The reasons for this have been the very high mortality associated with operation and the observed fact that many desperately ill patients recover without The position of medical treatment was further strengthened by the abandonment of starvation Though by withholding food the stomach is kept empty and to some extent at rest the ulcer is thereby subjected to the powerful digestive action of gastric juice unneutralised by proteins in the food, while the general power of resistance of the anæmic patient rapidly deteriorates from want of food Another factor in forestalling operation has been the timely adoption of blood-transfusion Nevertheless, as is pointed out by Bennett, Dow and Wright on an earlier page, the physician may still find himself in a terrible dilemma when he has to weigh the slender chance of the bleeding stopping of itself against an equally slender chance of his patient surviving a major operation In their view the dilemma need not often arise For some years at the Middlesex Hospital bleeding-ulcer patients considered by the casualty officer to be in danger have gone straight to the Courtauld research wards for observation Of 147 cases thus studied up to the outbreak of war 73 were classed as serious and 18 of them died But in the opinion of the investigators only 5 died from lack of blood and some if not all of these 5 would have lived if the blood could have been replaced in time The rule that a patient in whom one sudden hæmorrhage was likely to be fatal should be transfused has substantially bettered the later series Bennett and his colleagues have concentrated in their inquiry on the true indications for surgery but have not yet formulated any final judgment

In contrast to this special study there is a consensus of opinion that a third or more of patients with the massive type of hæmorrhage die if the surgeon does not intervene But when the bleeding occurs in younger patients most of them recover, provided they get rest, blood-transfusion and food[1] The poor results of surgery are attributable very largely to delay in operating, for far too often the surgeon is called in when the bleeding has been going on for some days or there have been repeated hæmorrhages The patient has then passed into a nephrotic condition with retention of nitrogen and œdema from renal failure due to low blood-pressure and anæmia The surgical risk is then immensely increased, as is the fatality without operation when the bleeding goes on Chiesman[2] found in 62 patients in whom the hæmorrhage had persisted for more than two days a 74% fatality In the younger group Walters and Cleveland think that the outlook cannot be bettered by surgery In the older age-group lives may be saved if operation is done within 48 hours Thus Finsterer[3] reported a fatality of 5 1% in cases operated on within this time limit, against 29 7% in those operated on later John Borer,[4] who also advocates surgery in the older patient, gives as the indications for surgery a rapid pulse, drop in blood-pressure, air-hunger, slight delirium, and reduced blood-count and hæmoglobin It must be remembered, however, that in a blood sample taken immediately after a massive hæmorrhage, before some of the fluid part of the blood has been restored by absorption from the tissues, the hæmoglobin and blood-count will not be lowered (This point is well illustrated in fig 3 on p 553) Borer recommends the passage of a Ryle tube into the stomach, which is washed out with normal saline until the liquid returns clear If the hæmorrhage continues he thinks it necessary to operate The Ryle tube not only acts as the only reliable index of what is going on in the stomach but is useful for

---

[1] Walters W and Cleveland W H *Trans Amer surg Ass* 1941, 59, 267

[2] Chiesman W E *Lancet*, 1932 ii 722

[3] Finsterer, H *Surg Gynec Obstet* 1939 69, 291

[4] *Trans Amer surg Ass* 1941, 59, 296

He advocated the treatment of VD by a special panel of doctors, as is the case with obstetrics. The vast majority of general practitioners in Lanarkshire were in favour of this suggestion.

Captain D. P. HIGGINS, C.F., said that as chaplain to two military VD hospitals he had come in close contact with the social and domestic problems to which VD gave rise, and could state that compulsion was not resented by Service VD cases. He had found great ignorance among lay people concerning VD and thought that much further education was required.

Miss TURNER, representing the Society of Moral and Social Hygiene, said they opposed notification and compulsion on principle. She thought such measures would lead to concealment.

Dr. J. M. VINE (Grimsby) thought the time opportune for a united demand for compulsory powers. He pointed out that such legislation would be little different from the powers granted to local authorities last October to control scabies.

Dr. DAVID ERSKINE (London) thought that notification would increase the stigma of VD, and he was not in favour of compulsion.

Drs. R. P. A. MACAULAY and R. M. WARREN, Surgeon Lieut.-Commander J. S. C. COULTER, R.N., and Lieut.-Colonel A. J. KING, R.A.M.C., also spoke in favour of compulsion.

Dr. W. N. MASCALL (London) thought that compulsory powers were required, especially to ensure that the syphilitic mother received adequate treatment during pregnancy.

Dr. MORNA RAWLINS (London) asked for greater educational efforts and more adequate treatment facilities for women.

Major W. V. FAWKNER-CORBETT, R.A.M.C., urged that adequate powers should be available to control the spread of VD by the considerable number of young people of unstable or deficient mentality who were being invalided from the Services.

The PRESIDENT thought that the existing scheme worked well. He emphasised that the Ministry of Health maintained a close watch on the position and mentioned the recent inquiry into the adequacy of the hours for attendance at the clinics throughout the country.

Dr. FORGAN proposed that a division be taken on the resolution "that, in the opinion of this meeting of the Medical Society for the Study of Venereal Diseases, further measures, legislative and administrative, in the treatment and prevention of VD are required to deal with defaulters, sources of infection and contacts." This resolution was seconded by Mr. HAMISH NICOL (London) and passed unanimously. Copies of the resolution are to be sent to the Minister of Health and the Society of Medical Officers of Health.

In summing-up, Major LAIRD said he wanted further education of the public and medical profession; full use of the existing voluntary method with, in addition, powers to deal with those whom the voluntary system failed to control. As in Sweden the threat of compulsion would prove sufficient in the vast majority of cases and the actual use of compulsion would only rarely be required.

Reviews of Books

Disease and the Social System

ARTHUR GUIRDHAM, D.M. Oxfd., D.P.M. London: Allen and Unwin. Pp. 239. 10s. 6d.

SO much nonsense about health and disease has been believed at different times down the ages that it would be presumptuous for this generation to claim that its present ideas will be valid a century hence. Dr. Guirdham is well ahead in his hearty disagreement with many current medical beliefs, and champions several unusual ideas. Some of these—for example, his recognition of *emotional factors in rheumatism, duodenal ulcer and arteriosclerosis*—may be accepted by the whole profession in a few more decades, though probably not in the form in which Dr. Guirdham enunciates them. He attempts to prove that many diseases we call physical are due in part to the reaction between adverse factors and traits of temperament. Psychiatry, as he points out, has stressed the effect of environment on man, but is limited to the family milieu and does not deal with morbidity induced by *differences in social and economic status*. He discusses disease and personality and the interaction of strain, physique and posture, asserting that most chronic disease, physical as well as nervous, is *neuropathic and attributable to abnormal emotion* on vulnerable personalities. He also reviews the rôle of our present social system in producing such abnormal emotion. His short staccato sentences make all his pronouncements seem unnecessarily dogmatic. "The Americans are a young people. They scour the universe too quickly. They draw conclusions from trifling data. They flood the world with nostrums, each in turn a six months' fashion." Sweeping assertions of this kind are unsatisfactory premises for argument.

Endotracheal Anæsthesia

NOEL A. GILLESPIE, D.M. Oxfd., D.A., resident in anæsthesia, University of Wisconsin, Madison: The University of Wisconsin Press. Pp. 187. $4.

Dr. Gillespie condenses into this book the salient facts of endotracheal anæsthesia, and gives an extensive bibliography. He teaches that there is no royal road to the knack of passing an endotracheal tube; the beginner, he says, can only acquire skill by constant practice; he must face the fact that "learning to intubate is a via dolorosa, that he will often inflict trauma and that he will undergo much embarrassment, vexation, and humiliation in the process of learning." Good anæsthetists like good golfers, he reminds us, aim at keeping out of trouble rather than at making a masterly recovery from it; but though intubation avoids many anæsthetic difficulties it has perhaps been overdone in this country whatever may be the case in America. It is a pity to deepen anæsthesia in order to make the patient tolerate a tube when light anæsthesia would suffice for the operation. Dr. Gillespie, who appreciates this point, emphasises the need for deepening anæsthesia before intubation until there is flaccid relaxation of the mandible and suppression of the pharyngeal and glottic reflexes; the beginner, having reached this point, should deepen anæsthesia yet further, to ensure that conditions will persist unchanged while he identifies the structures and passes the tube. Laryngoscopy may then be undertaken. He is a little wide of the mark in suggesting that the usual pressure in a full gas cylinder is *about 2000 lb. per sq. in.*; actually the pressure in a cyclopropane cylinder is about 75 lb. and that in a nitrous oxide cylinder 650–700 lb. per sq. in.

Fit to Fly

MALCOLM C. GROW, M.D., lieut. colonel, Medical Corps, U.S. Army; HARRY G. ARMSTRONG, M.D., captain, Medical Corps, U.S. Army. London: D. Appleton Century Co. Pp. 387. 15s.

THIS is a book for pilots or young men who wish to become or are in the process of becoming military pilots. The credentials of the writers for this specific task are beyond reproach: both have for years been in medical charge of U.S. Army pilots, and in addition Dr. Armstrong's research in this field is well known, and he has written the most readable manual in English on aviation medicine. In the preface the authors point out that the true airman must keep at his job for years and years if he is to become really expert; the book is an attempt to guide the young pilot in achieving this aim. No-one wants to enter a profession and find himself unable to continue after eight or ten years of activity, and the second aim of the book is to show how a man can keep on flying. It will probably be more widely read in the United States than here because it contains much medical jargon unlikely to be familiar to young men in this country, which may make it rather heavy going. Advertisers in America employ medical terms freely, and Americans are thus much more familiar with them than Englishmen. This will not deter the enthusiast, however, and an over-simplified approach might have made the book less useful. Every aspect of flying hygiene is covered from the care of the bowels and the use of tobacco to the effects of gravity and the more obvious manifestations of the commoner tropical diseases. The mental aspects of flying are well discussed; these chapters should be useful to the young man who is highly strung and imaginative—a type who often becomes an excellent military pilot if the correct mental attitude is inculcated. The style is level-headed and easily digested.

THE LANCET

LONDON　SATURDAY, MAY 9, 1942

THE ROUGH STUFF

One can sympathise with the practitioner who puts other questions about national bread before asking about its calcium content These days he is increasingly interested in promoting health as well as obstructing disease, but he has patients in his waiting-room who will want to know whether the new bread will upset their insides and interfere with the treatment prescribed There have been pronouncements ex cathedra about this But do they carry conviction? Not altogether, judging by the searchings of heart which are still going on among practitioners Half the trouble has been in the nomenclature of the new flour Some speak of it as wholemeal, which it certainly is not, others as wheatmeal, which is technically correct, but too likely to be confused with wholemeal to be a safe name for general use National is the name to be preferred, and looks like ousting its rivals A glance at the composition of the new 85% flour may help to settle some of the doubts By definition the flour should contain a minimum of bran but a maximum of germ The fibre increase over white bread will be very small and the extra will probably do no harm to patients with gastric and duodenal ulcers It is most unlikely to affect adversely either spastic colon or ulcerative colitis, and it should certainly be given fair trial in these cases, for it has advantages over white bread in its vitamin content which may well outweigh possible disadvantages What about gout? White bread can be regarded as a purine-free food Not so the 85% flour, which contains all the germ of the wheat, and therefore must give rise to appreciable amounts of uric acid during metabolism Whether this will matter remains to be seen We know so little about the true pathology of gout that it would be folly to clamour now for the special production of a white loaf which may after all be unnecessary The national loaf has come As medical men, it is up to us to support it until we have convinced ourselves by honest experiment that it is for some purposes not so satisfactory as the old white Then, if we speak, we can speak with conviction, and the Ministry of Food will no doubt do its best to meet our demands

BLEEDING PEPTIC ULCER

Ligature or pressure on the bleeding point is the normal way of dealing with hæmorrhage which does not stop of itself, but it has long been the custom of most physicians and surgeons to avoid surgical intervention for hæmorrhage from gastric or duodenal ulcers The reasons for this have been the very high mortality associated with operation and the observed fact that many desperately ill patients recover without The position of medical treatment was further strengthened by the abandonment of starvation Though by withholding food the stomach is kept empty and to some extent at rest the ulcer is thereby subjected to the powerful digestive action of gastric juice unneutralised by proteins in the food, while the general power of resistance of the anæmic patient rapidly deteriorates from want of food Another factor in forestalling operation has been the timely adoption of blood-transfusion Nevertheless, as is pointed out by **Bennett** Dow and **Wright** on an earlier page, the physician may still find himself in a terrible dilemma when he has to weigh the slender chance of the bleeding stopping of itself against an equally slender chance of his patient surviving a major operation In their view the dilemma need not often arise For some years at the Middlesex Hospital bleeding-ulcer patients considered by the casualty officer to be in danger have gone straight to the Courtauld research wards for observation Of 147 cases thus studied up to the outbreak of war 73 were classed as serious and 18 of them died. But in the opinion of the investigators only 5 died from lack of blood and some if not all of these 5 would have lived if the blood could have been replaced in time The rule that a patient in whom one sudden hæmorrhage was likely to be fatal should be transfused has substantially bettered the later series **Bennett** and his colleagues have concentrated in their inquiry on the true indications for surgery, but have not yet formulated any final judgment

In contrast to this special study there is a consensus of opinion that a third or more of patients with the massive type of hæmorrhage die if the surgeon does not intervene But when the bleeding occurs in younger patients most of them recover, provided they get rest, blood-transfusion and food[1] The poor results of surgery are attributable very largely to delay in operating, for far too often the surgeon is called in when the bleeding has been going on for some days or there have been repeated hæmorrhages The patient has then passed into a nephrotic condition with retention of nitrogen and œdema from renal failure due to low blood-pressure and anæmia The surgical risk is then immensely increased, as is the fatality without operation when the bleeding goes on **Chiesman**[2] found in 62 patients in whom the hæmorrhage had persisted for more than two days a 74% fatality In the younger group **Walters** and **Cleveland** think that the outlook cannot be bettered by surgery In the older age-group lives may be saved if operation is done within 48 hours Thus **Finsterer**[3] reported a fatality of 5 1% in cases operated on within this time limit, against 29 7% in those operated on later **John Borer**,[4] who also advocates surgery in the older patient, gives as the indications for surgery a rapid pulse, drop in blood-pressure, air-hunger, slight delirium, and reduced blood-count and hæmoglobin It must be remembered, however, that in a blood sample taken immediately after a massive hæmorrhage, before some of the fluid part of the blood has been restored by absorption from the tissues, the hæmoglobin and blood-count will not be lowered (This point is well illustrated in fig 3 on p 553) **Borer** recommends the passage of a Ryle tube into the stomach, which is washed out with normal saline until the liquid returns clear If the hæmorrhage continues he thinks it necessary to operate The Ryle tube not only acts as the only reliable index of what is going on in the stomach but is useful for feeding purposes. He is also of the opinion that a limited X-ray examination can be carried out without risk to the patient, manipulation and pressure tactics of course being omitted. **Borer's** fatality-rate from gastrectomy in 23 gastric-ulcer patients over 45 years of age was 26%, compared with 22% from conservative treatment; in 55 duodenal ulcers it was 14·5% compared with 21·9%. **Walters** and **Cleveland** were not able to give comparable figures because the Mayo Clinic has not in the past classified the massive *hæmorrhage* cases separately. But in 1940 the risk from operating on bleeding duodenal ulcer was 6·8% in 73 cases. There were no deaths among 46 patients who had partial gastrectomy for 17 bleeding gastric ulcers, 3 bleeding gastric and duodenal ulcers, 26 bleeding jejunal and gastrojejuno-colic fistula type of ulcer.

---

[1] Walters W and Cleveland W H *Trans Amer surg Ass* 1941, 59 267

[2] Chiesman, W E *Lancet* 1932 ii 722

[3] Finsterer H *Surg Gynec. Obstet* 1939 69, 291

[4] *Trans Amer surg Ass* 1941 59 296

Partial gastrectomy or gastroduodenectomy is a formidable undertaking in the presence of bleeding, but these results seem to warrant such major procedures. Investigation shows that over 90% of the patients are permanently cured. In extreme cases a less severe operation may sometimes suffice to save the patient's life and allow a subsequent major operation to be undertaken with less risk. When a posterior ulcer has caused bleeding from a vessel in the pancreas, the lesser sac may be penetrated below the greater curvature, the ulcer edge separated from the pancreatic tissue, the resulting hole in the stomach sutured and the bleeding point ligated, a procedure which takes only a short time. And some patients have been saved by ligating vessels going to an ulcer and turning it in.

DIFFUSION OF SULPHONAMIDES INTO BODY FLUIDS

In most diseases, other than septicæmia, which are treated with sulphonamide compounds, the therapeutic effect obviously depends on the concentration of the drug in the infected tissues, and only to a minor degree on that in the circulating blood. It is generally considered that these compounds diffuse readily from the blood into the tissue fluids and that an equilibrium between the two media is established rapidly. This belief is usually based on the observations of **Marshall** and **Long**[1] that when sodium sulphapyridine is injected intravenously the greatest fall in the blood concentration occurs during the first 5–10 minutes, with only a relatively slight drop during the next hour. They concluded that the distribution between blood and tissues is complete or nearly complete in 5–10 minutes after its intravenous injection. Review of their data, however, reveals that only few determinations were made 5–10 minutes after the compound was administered. This question has been investigated by several workers. Thus **Marshall**, **Emerson** and **Cutting**[2] compared the concentrations in the blood and cisternal fluids of dogs at intervals after oral administration. After an hour the concentration in the cisternal fluid (0·5 mg. per 100 c.cm.) was 12·5% that of the blood, and after 4 hours it was 70% that of the blood. **Nathanson**[3] found that an hour after intravenous injection of sodium sulphapyridine the concentration in a pericardial effusion was 1·9 mg. per 100 c.cm., while that in the blood was 6 mg.; after 1½ hours the concentration in the effusion was 2·3 mg. while that in the blood was still 6 mg. **Bellows** and **Chinn**[4] found that the concentration of sulphanilamide in the aqueous humour of dogs, an hour after oral administration, was about a third of that in the blood, rising to a maximum of nearly two-thirds 4 hours after administration. According to **Marshall**, **Emerson** and **Cutting**,[5] 4 hours after oral administration of sulphanilamide to dogs the concentrations in the skeletal muscle, heart muscle, liver, lungs, spleen and skin were essentially the same as in the blood. In all these experimental observations it should be remembered that in dogs none of the compound is lost by acetylation, while in man and most other animals considerable quantities are diverted in this way. Recently the question has been carefully investigated by **Cantarow**, **Cubberley** and **Rakoff**,[6] working with dogs and rabbits. An artificial peritoneal effusion was produced by injecting 100–250 c.cm. of normal saline into the peritoneal cavity and then sulphanilamide was injected intravenously. Samples taken for analysis showed that the concentration of free sulphanilamide in the blood fell continuously, while that in the peritoneum rose gradually reaching a maximum after about 2–3 hours and then declining. The concentrations in the plasma and effusion were equal at about 2 hours; before this, sulphanilamide passed from the blood into the effusion; after this, it passed from the effusion into the blood. It may be concluded that with small effusions there is a lag of several hours before the concentration in the effusion reaches the same level as that in the plasma; presumably with large effusions the lag is correspondingly larger.

Of more importance than the speed with which equilibrium between tissue fluids and blood is reached is the final ratio ultimately attained between the two concentrations. This varies according to the particular sulphonamide employed. **Katzenelbogen**, **Cruvant** and **Silverberg**[7] studied patients who received 1·7 g. of sulphanilamide every 6 hours; after 24 hours the ratio of the spinal-fluid concentration to the blood concentration was 60–90% and after 3 days the ratio was 70–90%. During the first three or four days after the drug was discontinued the ratio rose to 100–170%, since the level in the fluid fell more slowly than that in the blood. From a review of the literature, these workers conclude that sulphamidochrysoidin ('Prontosil rubrum') enters the cerebrospinal fluid with difficulty and only in cases of well-marked meningeal inflammation, while azosulphamide ('Prontosil soluble') enters more readily. Malaria treatment favours the passage of prontosil from blood to fluid, the amount passing across being in proportion to the globulin content of the fluid. In patients with an "intact" blood cerebrospinal-fluid barrier, azosulphamide and dimethyldisulphanilamide do not enter the fluid during the first 5 hours after administration, sodium sulphanilate enters in only very small amounts, while sulphanilamide enters most readily of all. The concentration of sulphapyridine[8] in the cerebrospinal fluid reaches about 70% of that of the blood, while that of sulphathiazole[9] is only 15–40% that of the blood The level of sulphadiazine in the cerebrospinal fluid reaches 50–80% that of the blood[10] HEYL[11] found that the concentration of sulphathiazole in the fluid of infected or uninfected knee-joints was approximately the same as that in the blood Accordingly it can be seen that from the practical point of view a satisfactory therapeutic concentration of most of the sulphonamides can be reached in the cerebrospinal fluid by simple oral administration, and it is now recognised that attempts to increase this by direct intrathecal injection are both unnecessary and dangerous With the other body fluids, however, although diffusion readily occurs from the blood, there are advantages to be gained under certain circumstances—e g peritonitis, expected infection of a knee joint—by inserting the compound directly into the cavity

---

[1] Marshall, E. K., jun. and Long, P. H. *J. Amer. med. Ass.* 1939, 112, 1671.

[2] Marshall, E. K., jun., Emerson, K., jun. and Cutting, W. C. *Ibid*, 1937, 108, 953.

[3] Nathanson, M. H. *Ibid*, 1941, 116, 280.

[4] Bellows, J. and Chinn, H. *Ibid*, 1939, 112, 2023.

[5] *J. Pharmacol.* 1937, 61, 196.

[6] Cantarow, A., Cubberley, C. L., jun. and Rakoff, A. L. *Arch. intern. Med.* 1942, 69, 156.

[7] Katzenelbogen, S., Cruvant, B. A. and Silverberg, C. *Amer. J. med. Sci.* 1941, 201, 724.

[8] Marshall, E. K., jun. and Litchfield, J. T., jun. *J. Pharmacol.* 1939, 67, 454.

The fact that the concentration of sulphonamide in the cerebrospinal fluid is usually lower than that of the blood can be explained by several factors The usual reason given is that the meningeal membranes are only partially permeable to certain compounds, but it is doubtful if this view is correct, since such a partial permeability would not affect the point at which equilibrium was finally reached, however much it might delay its attainment A more important factor is that many of the compounds are not equally distributed between erythrocytes and plasma, and the latter is obviously the one for consideration in this case Thus if the concentration in human plasma is taken as 1, the concentration in the corpuscles is 2 1 for sulphanilamide, 0 6–1 1 for sulphapyridine, 0 3–0 4 for sulphathiazole, 1 5 for sulphacetamide, 1 for 'Uleron,'[12] and 0 6 for sulphadiazine,[11] all compounds being in the free form, in rabbits' blood the distribution is slightly different Since British and American workers commonly use whole blood instead of plasma for sulphonamide determinations, this factor makes a considerable difference A third explanation on the basis of dialysation experiments with human plasma is given by DAVIS,[13] who considers that part of the sulphonamide may be bound in some way to the plasma proteins According to his figures, the proportion of unacetylated compound thus bound is—sulphanilamide 20%, sulphapyridine 40%, sulphadiazine 55% and sulphathiazole 75% If his work is confirmed, it may require a reconsideration of the significance of the blood concentrations of the different compounds, since the bound fraction of the drug is probably inactive

There is one snag about the sampling of body fluids Papers have appeared recording concentrations in pleural effusions, &c of 50–100 mg per 100 c cm, which persisted for many days after administration of sulphanilamide had been discontinued The most probable explanation of these abnormal findings is that procaine was used as a local anæsthetic for the withdrawal of the specimens Since procaine contains the aminobenzene group, it gives the same colour reactions in Marshall's test as sulphanilamide Specimens must be obtained either without local anæsthetic or with one of the other cocaine substitutes which does not contain this group

STORY OF A REJECTION

A CITY council has turned down the recommendation of its education committee to appoint a German Jewish woman refugee as educational psychologist We are not concerned with the wisdom of rejecting the advice of the body appointed to make the recommendation, clearly the full council had the right to reject decisions brought to it for approval Their reasons for doing so, however, are of general interest, and have a bearing on the use made of refugee talent in this country Among other things it was suggested that it was unwise at the present time to appoint anyone of enemy nationality, though it was known that this refugee had left her own country because of her opposition to the regime we are now fighting, that Home Office permission for her to do such work here had been granted, and that her personal loyalty had never been questioned It was also objected that a German would find it impossible to understand British mentality and that all German psychology must be regarded as suspect—a strange reward for WUNDT and KRAEPELIN who laid the background to modern psychology and psychiatry A bitter part of the present struggle is the monstrous distortion by the Nazi philosophy of Germany's contribution to the humanities Not only would this psychologist have difficulty, it was said, in understanding the British mind in general, she would be particularly at sea with the minds of north-country children The work of a psychologist, however, is not the same as that of the doctor making a diagnosis on a case as a whole Academic psychology works by scientific method, and the mental test most commonly used was designed by a Frenchman, revised by an American, and standardised for use all over the world The giving of the test requires only knowledge of the method, and results are judged by a rating scale almost as rigidly applied as a standard weight or measure, this part of the total investigation of a difficult child could therefore more easily be undertaken by a foreigner than any other part A more genuine difficulty—mentioned but not stressed in the council meeting—is that a foreigner, lacking a comparable background of pedagogic knowledge and experience, may not be able to gain the confidence of the school teacher. Educational methods vary in different parts of the country and there may have been some unusual features in this part of the north, but this refugee psychologist had already worked successfully in Devon and in Birmingham MAPOTHER held that an appointment should never be made primarily on the basis of experience, which he maintained was the easiest of all deficiencies to remedy Appoint the right person, he used to say, and he will soon find the experience The education committee were confident that in this particular candidate they had found the right person, and said so in no uncertain terms One councillor contended that in any case refugees always had a refugee complex Decisions such as this help to explain why this must be so At present many of our home-trained personnel are serving with the Forces, and there has never been such need of trained workers in the field of child guidance We have too long been indifferent here to this need, nearly all the money available for training doctors, psychologists and social workers in child guidance still comes from America, in the form of Commonwealth Fund grants, and this has been so for the last twelve years We can ill afford to put aside the talent which is coming here from countries too stupid to make use of them

---

[9] Banks H S *Lancet*, 1941, i 104
[10] Long P H *J Amer med Ass* 1941 116 2398 Reinhold J G, Flippin H F, Schwartz, L and Domm, A H *Amer J med Sci* 1941 201 106
[11] Heyl J T *Proc roy Soc Med* 1941, 34, 782
[12] Simesen M H *Arch exp Path Pharmak* 1940, 197, 12
[13] Davis, B D *Science*, 1942, 95, 78

Annotations

DECLINING BIRTH-RATE

COMPARED with London's eight million, Australia's 6,930 000 whites seem a small population for 2,974,000 square miles of country If ever a race had room to stretch itself Australians, it would seem, are in that happy position But it must be borne in mind that over the central 1,067,000 miles of that vast area the rainfall is less than 10 in a year, and the population, comfortably spaced certainly, is distributed along the southern, eastern, and part of the western littoral The growth of this population has been rapid since 1788 when the first settlers arrived Dr McCleary in a recent survey[1] points out that by 1850 the colonists had increased from 850 to 405,000, the gold rush in 1851 raised the numbers to 1,145,000 in 1860 After the gold rush the birth rate was 42 per 1000, and even when the immigration of young men slackened it remained at about 35 per 1000 until 1888 By that time the decline in the English birth rate had begun, and that of Australia followed, yet between 1881 and 1920 the average rate of increase of population was still 22 per 1000—higher than that of any other country except New Zealand and due largely to excess of births over deaths, though immigration still accounted for 23% of the increment In England the fall began after the conviction and successful appeal of Charles Bradlaugh and Annie Besant, prosecuted for selling a book on contraception, and a similar successful appeal after conviction by a Sydney bookseller was followed by a comparable trend in Australia By 1903 the fall was sufficiently great for the government of New South Wales to appoint a royal commission to look into it The commission found no reason to blame economic causes for the fall, which they attributed chiefly to contraception and partly to abortion The rate in 1934 had fallen to 16 4 per 1000 Dr Enid Charles, who reviewed the position between 1909 and 1931, put the decline down to an increase in the number of childless women, and the falling off in family size—the two children family having become more popular than any other pattern The exceptionally low mortality in Australia has somewhat masked the effects of this falling birth-rate, but the reproduction rate is now below the level required for maintaining a stationary population It is estimated that, with the present trend, the Australian population will reach its maximum within the next forty years and begin to diminish before the end of the century

Australia's position is not, of course, unique, Sir Francis Fremantle, writing of the dangers of population decline,[2] noted that our present birth rate is about 14 1, and the crude death-rate 14 He quotes the finding of Charles that if fertility and mortality remain constant at the 1935 level our population of 41 million would fall in forty years to 36 million, and in a hundred years to 20 million, but if the fall in fertility continues steadily then the figures would be 31½ million in forty years and 4½ million in a hundred The position in Europe is not significantly different, Lord Horder and Mr R M Titmuss point out[3] that although the German birth-rate rose after 1933 at no time since Hitler came into power has it been high enough to replace existing numbers, and what rise there has been seems to be largely due to the suppression of illegal abortion The Nazis themselves admit that 150,000 fewer children were born 1940 than in 1939, during the first quarter of 1941 t birth-rate was 24 5% lower than in the correspondi quarter of 1940, and fell still further in the next quarte In Italy the birth-rate has continued to decline in spi of Mussolini's campaign Dr L J Picton[2] thinks o fertility may be restored by 85% extraction flou through the return of the wheat germ oil missing fro our diet since 1872 Certainly no-one complained of t birth-rate then It is doubtful how far contracepti have contributed to the decline Do people have few children because they use contraceptives, or do th use contraceptives because they want fewer children Horder and Titmuss take the view that the task befo us is to produce an environment in which people w be glad to have children, and quote from "Populati and Fertility" the words of Mr D V Glass and Dr C Blacker "Now that people are equipped with t means of preventing births, the reproductive impul is seen to be a delicate thing, struggling for expressi against numerous checks and obstacles It may we prove to be incapable of effective resuscitation unt drastic changes for the better are introduced into o social and international life"

SULPHADIAZINE TREATMENT OF BURNS

ANOTHER way of solving the problem of infection i the treatment of burns has been suggested Pickrell uses sulphadiazine, which is active against both strept cocci and staphylococci In view of the claims made for this method, which has been applied to over 100 cases, it merits a critical examination A 3% solution of sulphadiazine is sprayed on the burn at regular intervals for some days At the end of this time an eschar forms which is tough, pliable and translucent, and movement of the injured part may be carried out without fear of damaging the eschar It appears that infection was only seen in one case, and that occurred after the eschar had been soaked off, why the soaking off was necessary is not clear No mention is made of the fate of the sloughs, and it is important to know what happens to cases where extensive sloughing will take place, for it is the presence of dead tissue that controls both the susceptibility to and the severity of any bacterial infection. Furthermore, the slough of a deep burn takes a week or more to begin to separate, and presumably from the third day onwards when the eschar has formed no more sulphadiazine can be absorbed from the solution sprayed on the burn For this reason alone this method is unlikely to appeal to those called on to treat the deep localised burns of modern warfare A more serious objection to the technique is its laboriousness An eschar may take as long as four days to form and during that time as many as 50 separate sprayings must be carried out During the whole of this time the moist surface must be protected from cross infection, and this together with the obvious difficulties of spraying a circumferential burn, may well be beyond the resources of a hard worked hospital in periods of emergency

SALINE AND GLUCOSE INFUSION

THE extensive use of saline and glucose infusions in many clinical conditions calls for knowledge of the changes to be expected in normal subjects Stewart and Rourke[2] of Harvard have therefore made detailed observations on normal women after small gynæcological operations They gave large amounts of isotonic salt and glucose solutions over a period of several days, and found that salt solution to the extent of 6 5 litres daily produced a gain in weight and a large increase in the volume of extracellular fluid, while 5% glucose solution produced a loss of weight and diuresis that followed intake accurately "The renal regulator," they say, "is extremely sensitive to changes in composition of extracellular fluid, but is quite tolerant of increases in extracellular fluid volume." Chiefly remarkable in the glucose experiments was the ability of the kidney to conserve sodium, so that the concentration of this ion in the urine is held below 0.01 M. In one subject, however, this mechanism failed with consequent loss of sodium in the urine, fall of plasma sodium and the appearance of symptoms of water intoxication—vomiting, epigastric distress, disorientation and excitement, leading on to coma. Since in acute experiments saline leaves the circulation rapidly, there is great interest in the figures for one subject given 26.69 litres of 0.9% NaCl over four days. The plasma volume (estimated with the blue dye T-1824) increased from 3008 to 4730 c.cm., while available fluid (thiocyanate method) increased from 11,960 to 21,850 c.cm., and there was an equal proportional fall of 25% in hæmatocrit, oxygen capacity and plasma protein. These changes are too great to be accounted for by errors of technique, or changes in distribution of plasma or in red-cell size, and although the Harvard workers may be optimistic in expressing plasma volumes to the fourth place, there can be little doubt that the circulation shared in the general increase of fluids. They calculate that the procedure called on reserves of protein so that total circulating protein increased, and although there is some evidence in acute experiments that giving intravenous saline may mobilise protein, their figures for total oxygen capacity show a discrepancy that would make it unwise to draw conclusions from a single observation. Since great individual variation may be found after rapid saline injection into man, the results on drip infusions obtained by Stewart and Rourke in a few subjects do not permit general conclusions to be drawn, but their data should prove of value to workers in this field.

---

[1] McCleary, G F *Milbank Memorial Fund Quarterly*, 1942, 20, 23
[2] *Times*, April 17, 1942
[3] *Ibid*, April 20, 1942

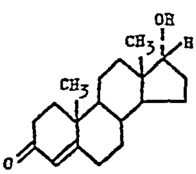
[1] Pickrell, K L *Bull Johns Hopk Hosp* 1941, 69, 217
[2] Stewart, J D and Rourke, G M *J clin Invest* 1942, 21, 197

RECORDING THE SCHICK TEST

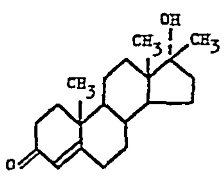
THE staff of the Emergency Laboratory Service at Cambridge[1] say there is still uncertainty about the optimum time for reading a Schick test. They say also that a reading at 24 hours (a final reading is implied) has been advocated in controlling a diphtheria outbreak, which will surprise anyone with the slightest practical experience of Schick reactions. Nevertheless, precise information on the frequency of *late* positive reactions is welcome, particularly at a time when diphtheria immunisation in this country is assuming some of the importance it deserves. Observations were made at two, four and seven days among positive reactors comprising (*a*) a group of 154 school-girls aged 10–18 years and (*b*) 218 medical students aged 18–23 years. The majority were primary Schick tests. In the first group, 14 reactions were negative or doubtful after two days, 5 were doubtful after four days, but none were negative or doubtful at seven days. The corresponding figures for the medical students were 39 negative or doubtful reactions at two days, but none at four days; after seven days, of 2 previously recorded as positive, one was negative and the other doubtful. There is no certain explanation of the more rapid reaction to Schick toxin evidenced by the school girls but age was probably the important factor. Taking the combined figures, in 372 Schick-positive reactors, 14.2% were negative or doubtful at the two-day reading. No significant difference in positive rates could be detected between readings at four and seven days, but the size of the reaction tended on the whole to increase in this period. The general conclusion that the highest proportion of positive results at a primary Schick test is likely to be obtained when reactions are read after seven days therefore seems valid. This does not preclude earlier readings. Indeed in urgent circumstances, a very high proportion of Schick tests may be read as positive at the end of 48 hours and appropriate action taken. What must be avoided is the assumption that a reaction is negative until four and preferably seven days have passed.' All this, in fact, reflects current practice at fever hospitals and most diphtheria immunisation clinics.

METHYL TESTOSTERONE

THE orally active androgen, methyl testosterone which is now obtainable in tablet form,[1] is a pure crystalline substance prepared synthetically, and its relation to testosterone is shown in their structural formulæ.



Testosterone



Methyl testosterone

Methyl testosterone appears to have the same biological effects as other androgens, though wide species differences have been observed. In man it has been used successfully in many of the conditions in which testosterone propionate has already proved its value. In eunuchs, partial or complete, it causes development of the penis and secondary sexual characteristics, with concomitant sexual potency; but, like testosterone propionate and all other androgens so far described, it is useless in cases of impotency without clinically demonstrable hypogonadism. Hypogonadism in males is not common, and, like other androgens, methyl testosterone finds its chief uses in women. It causes complete suppression of the menses and of uterine hæmorrhage and is therefore useful in various forms of excessive bleeding, such as that from fibroids and in metropathia hæmorrhagica, as well as in cases of anæmia in which it may be advisable to suppress even normal menstruation for a time. It suppresses lactation, though for this purpose it is unlikely to supersede stilbœstrol; it is helpful in the menopausal syndrome when œstrogenic therapy is poorly tolerated. Other uses, less well established by clinical trial, have been suggested. It appears to be less potent than testosterone propionate in the production of masculine features in female patients, but nevertheless a careful watch should be kept for hypertrichosis, acne, enlargement of the clitoris and deepening of the voice.

Methyl testosterone is likely to have a wide field of use, but its indiscriminate exhibition is to be deprecated until reports based on large series of cases observed under controlled conditions have been published. In particular it should be emphasised that it is worthless in men who show no evidence of hypogonadism and that it is not an aphrodisiac.

NASAL IMMUNISATION

MANY attempts have been made to overcome the minor inconveniences of diphtheria immunisation, the reactions and needle-pricks. Adult pseudo and positive reactors may suffer severe discomfort. Bunch[2] found that 36 of 93 Schick-positive medical students and nurses were strongly sensitive, responding actively to minute amounts of toxoid given intracutaneously. He managed to immunise this highly sensitive group without severe trouble by injecting 0.1 c.cm. of 1 in 100 toxoid intradermally thrice at weekly intervals. Six months later most were Schick-negative. The few positive reactors then received a rather tedious sequence of gradually increased doses of 1 in 100 toxoid given subcutaneously until all were Schick-negative. With the aim of avoiding the second injection of the orthodox course, Jensen strongly advocated nasal instillation of toxoid but this method has certain drawbacks of its own.[3] Phair[4] now brings further evidence on the point. He used nasal instillation for 46 physicians and health officers. On four occasions, at 2-day intervals, a drop of the glycerin-toxoid mixture was instilled into each nostril The procedure acted as an efficient stimulus in those already sensitised either by having had diphtheria or being artificially immunised and in those who without any such history showed 1/400 unit or more of antitoxin per c cm in their blood Of the 46, 34 fell into this group and 33 developed a material increase of antitoxin titre after the nasal treatment On the 12 subjects who gave no history of contact and had no antitoxin in the blood the nasal application failed to act as a primary immunising stimulus, for 11 showed no increase of antitoxin after the treatment The reactions after the nasal instillations were mostly minor but 6 of the volunteers suffered severe reactions with frontal headache, persistent nasal œdema and blocking, and in 2 the reactions were so severe that they did not complete the course Phair suggests that since few children are pseudo-reactors, sensitive to toxoid, the method may be less open to objection in infant work, he has further investigations in children in progress

---

[1] *Mon. Bull. emerg. publ. Hlth Lab. Serv.* April 1942, p. 7.

[1] 'Neo-Hombreol (M), Organon Laboratories. Each tablet contains 5 mg.

[2] Bunch, C. P. *J. Immunol.* 1940, 39, 427.

[3] See *Lancet*, 1941, i, 153.

[4] Phair, J. J. *Amer. J. Hyg.* 1942, 35, 292.

"MICE THAT MAR THE LAND"

WHEN it was established, in the early years of this century, that bubonic plague was spread by the rat flea, an ancient popular belief that this hated parasite was connected with the pestilence was recalled Scholars and students ransacked the records of history for evidence of this knowledge The Bible tells us the story of the plague which attacked the Philistines after their capture of the Ark and of the trespass offering of golden images of their boils, and of the mice infesting the countryside Otto Neustatter[1] has examined afresh the work of early painters and engravers Nicholas Poussin, of course, introduced rats or mice into his picture of the plague of the Philistines, and it has long been believed that this was the only example to be found in art Neustatter has examined illuminated manuscripts and early illustrated Bibles and has found some half-dozen illustrations in which rats or mice are depicted in connexion with plague All these however are illustrations of the Philistine pestilence, and he has failed to find among numerous other illustrations dealing with plague any depicting the rat or mouse He concludes that there is no evidence here that artists of the Middle Ages and the Renaissance recognised any causal connexion between rodents and plague Yet the evidence from other sources—largely, it is true, traditional and implied rather than asserted—is striking We are told that the Chinese word for the plague means "the rat disease" and that the Himalayan peoples were aware that an unusual mortality among the rodents always preceded an outbreak of the plague among men Neustatter's ingenious article, however, seems to dispose of the idea that there was any widespread popular belief of the kind in Europe

ANTI-DIPHTHERIA CAMPAIGN

A THIRD of the children under 15 in England and Wales have now been immunised against diphtheria The Minister of Health, while expressing his appreciation of this achievement (circular 2627), is not satisfied that anyone should let it rest there, and reminds local authorities that if the incidence and mortality-rate of diphtheria are to be substantially reduced at least three out of every four children must be immunised We have pointed out already[2] that to immunise school children and neglect those of preschool age is not enough, indeed it was shown ten years ago that immunisation of even half the school-children has no effect on the incidence of diphtheria unless a third of the children of preschool age have also been protected Diphtheria is the most fatal of all diseases among children between the ages of 4 and 10, and the second most fatal disease among those between 2 and 5 Bearing this in mind, the Minister insists on the primary importance of immunising children under school age He urges that vigorous efforts should be made this spring and summer to protect more children While the ministry will go on stimulating the campaign by general publicity, all local publicity is in the hands of local authorities themselves, and they are advised to use posters, the press, and every possible form of personal persuasion, to bring the message home to parents, and to give them full and clear information about the facilities available Progressive figures showing the children immunised should be published regularly, and local papers should be asked to help by printing statements from the mayor, chairman of council chairman of the health committee and the medical officer of health Notices giving the addresses of clinics, and of days and times of sessions can be shown in trams and buses and on the screen at cinemas, paid advertisements in local papers may well include a form of consent to be completed and sent to the local authority But it is generally found that personal persuasion goes farther than the printed word, however winningly phrased The medical officer of health, doctors and nurses at welfare clinics, family doctors, health visitors and school teachers are the best evangelists for this gospel, and authorities are asked to do all they can to gain the cooperation of all in a position to use their personal influence in this way Telling leaflets and posters can be bought at about cost price, and films can be hired, from the Central Council for Health Education, Tavistock House, London, W C 1

MASS RADIOGRAPHY OF RECRUITS

THE Minister of Labour has had to admit his inability to apply X rays as a routine in selecting recruits for the Armed Forces Mass radiography may be the ideal method of eliminating pulmonary tubercle but his advisory committee still regards it as too much to expect of the medical boards and the more so now that the examining centres have been scattered over more than 200 places in the country The position shown in a white paper (Cmd 6353, 1d) just issued is clearer than when the committee reported to the minister in June, 1940 Since then full effect has been given to the suggestion that medical boards should be advised by tuberculosis officers of any suspicion of tubercle in the recruit's past record, with the result that about 1% of candidates have been rejected on this ground leaving it is believed only 0 1–0 2% to be detected by miniature radiography during the period of training in one of the Services At the three main Naval depots active tubercle has been discovered in about 0 3% of trained men, but these include some recruited years ago In the RAF less than 0 2% of new entrants for air crew duties had positive films In the Army, where the numbers examined have been much smaller owing to shortage of apparatus, the incidence of pulmonary tubercle among new recruits has been 0 1% and during 1941 only 0 2% of men were discharged from the Army on this score The medical committee commends the steps already taken by the Services to extend the application of miniature film and is satisfied that the opportunity offered by training conditions is not being neglected

---

INDUSTRIAL MEDICINE —Addressing the Manchester Medical Society on April 1 on this subject, Dr M W Goldblatt said that the medical service should form an integral part of industry Doctors who act simply in an advisory capacity, or as glorified casualty officers, are in danger of providing a façade for the vague term "medical supervision", they will fail to develop into an active body fit to study the impact of industrial and social conditions on the workers Unless the doctor knows the processes of an industry thoroughly he can be out argued in his proposals He should study how to control the industrial environment and how to fit and maintain the worker safely in it Institutes for the study of hazards of industry are needed, and it is a sign of our apathy, Dr Goldblatt thinks, that there is no journal in this country devoted to industrial hygiene and toxicology

---

[1] *Journal of the Walters Art Gallery*, 1941, 4, 105

[2] See *Lancet*, 1941, ii, 161

Special Articles

COLOUR FILMS IN FIRST-AID TRAINING

B H Humble
LDS RFPS

A G Mearns
MD GLASG, DPH., FRSE

(*From the Glasgow Casualty Service*)

The excellent colour films of the Kodak library which show operative technique are well known, and the Emergency Medical Service have made a Technicolour film of plastic surgery Colour films made at the training establishments of the RAMC are used in the instruction of newly recruited medical officers, and Bunyan has also shown colour films of the treatment of burns As far as we are aware, however, no colour films are available which illustrate first-aid treatment of wounds Believing that colour cinephotography has definite advantages for instructional purposes we set out to produce a film in support of our contentions

Air-raid first-aid must often differ from the procedure laid down in manuals intended for peace-time, and it has been found advisable to aim at rough-and-ready street aid which can be applied under emergency conditions perhaps while the raid is still in progress In such teaching faked wounds have played an important part and the realism which these lesions supply has been found by instructors to be of great value in hardening personnel to the sights they are likely to encounter in action Several teachers have elaborated techniques, one of which has been described in a memorandum by A E MacLeod of the Dundee casualty service Much time skill and experience are required in order to prepare really effective wound reproductions[1] and the results can be appreciated by only a limited number of people at one time A film, on the other hand, may be exhibited to many large audiences and carry its instructional message with an accuracy closely approaching that of practical demonstration

A special technique had to be devised for the wounds since it was quickly found that methods which passed muster with an audience more than 6 ft away would not deceive the camera in close-up exposures at 2 ft Our aim has been 100% realism on the screen and the fact that several medical men have been unable to differentiate the faked wounds from real ones is proof of success In our early trials we did not aspire to major casualties but confined ourselves to simple lacerations burns and the like Later we attempted compound fracture and arterial hæmorrhage, and finally, with a view to realism, we staged and filmed a mock air-raid incident in which trapped and wounded casualties were liberated from heavy debris and treated first by street methods and ultimately in an aid post The wound technique employed though highly realistic, is simpler than the methods hitherto described, it differs from them in that the wounds are made directly on the patient at the time and are not fabricated effects strapped or otherwise fixed to him when required They are on this account perishable and cannot be used a second time We are nevertheless convinced that the trouble is more than repaid by the life-like results obtained

The wound film, which is 16 mm silent Kodachrome' has now been shown about fifty times mainly at first-aid posts and depots but also at rescue party depots, to wardens, firemen, Army units, the first-aid personnel of business firms and to the general public We have received many favourable reports; for example the medical officer of an Army unit wrote "Men greatly interested the instructional value is high and the films eliminate a lot of talk Requests for further shows have become embarrassing and its realism is demonstrated by a fainting rate of approximately 1% among audiences We regard our films which are quite unofficial, as still in the experimental stage, and in the light of experience there is a good deal that we should alter and add

WOUND FAKING

It is impossible in a short article to explain the methods fully, but two instances will illustrate the process sufficiently to allow those interested to experiment along similar or modified lines Two lesions repeatedly met with after air-raids are laceration with embedded glass and arterial hæmorrhage

Laceration of palm—A small oval piece of terracotta-coloured 'Plasticine' is smeared over the palm and pressed down firmly so that its edges blend into the surrounding skin It is then tinted with deep carmine grease paint and stippled with a match stick until a rough surface resembling lacerated flesh is obtained Two thin pieces of flesh coloured plasticine are next built round its sides to represent the edges of the wound and their bases are blended into the palmar surface by kneading and pressure The tops and inner surfaces of the wound edges are coloured with bright carmine grease paint and their outer sides with flesh-coloured grease paint, merging insensibly into normal skin tint If the blending is done with care it is wellnigh impossible to detect the junction of plasticine and skin and the effect is extremely realistic. A small splinter of ragged glass is then embedded in the wound and the edges brought close to it The palm and fingers are next smeared with 'K.Y' surgical lubricating jelly previously coloured to blood tint with 'Red Food Colour' (BDH) The effect is that of clotted blood Immediately before the wound is shown to the audience the patient is instructed to cup his hand and a synthetic blood solution, prepared by dissolving red food colour in water and adding soluble starch to give body and opacity, is poured over the wound The effect is thoroughly convincing, a doctor may remove the glass and treat and dress the wound, which will stand up to all the ordinary manipulations By building up a similar wound in the region of the shin and inserting a spicule of bone a compound fracture of the tibia can readily be simulated Many other applications of the technique will occur to the medical mind

Brachial and femoral hæmorrhages have been produced by means of a small Higginson syringe, a length of Southey tubing and an ammoniacal carmine solution The valve of the syringe dips into a bottle reservoir at the patient's side and the Southey tubing, fixed to the nozzle of the syringe, is led round the body to the desired point in the limb the end of the rubber tubing being embedded in a small wound prepared by the method already outlined If the patient squeezes the bulb of the syringe in the time of the cardiac rhythm, arterial bleeding is simulated perfectly, and since the apparatus is concealed partly by the clothing and partly by blankets a grimly realistic effect is obtained

It is essential in all cases of hæmorrhage or grave wounding that the patient's face be made up to suggest profound shock, and a lesson in theatrical make-up is of value Fullers earth to the face and neck and shading under the eyes and on the lips with a blue grease-liner gives a good shock effect A final touch consists in bedewing the forehead with beads of perspiration from an atomiser containing liquid paraffin The patient, too, should be taught to act the appropriate part We have now given over twenty clinical demonstrations of cases using the techniques described and many trained sisters, as well as medical men have testified to their realism compared with wounds prepared by the earlier methods which cannot stand up to close inspection

We wish to thank Sir Alexander Macgregor, medical officer of health of Glasgow, and Dr James Dunlop, medical officer in charge of civil defence casualty services, who gave us every facility at aid posts and depots

MEDICINE AND THE LAW

Hospital recovers from Patient's Estate

In 1936 the Public Health Act enlarged and rationalised the recovery by a local authority of the expenses of maintaining patients in its hospitals Legal ingenuity has revealed an unexpected uncertainty in the language of the act, but last month in Middlesex County Council v Kiverstein the Court of Appeal had no difficulty in giving the words their obviously intended interpretation

Mrs Black was admitted to the West Middlesex county hospital and died a few months later When her gross estate was found to amount to nearly £1700, the county council sued her executor for £74 odd, the cost of her maintenance The material enactment is section 184 which makes it the duty of the county council or local authority "to recover from the patient, or from any person legally liable to maintain him, or from the patient's estate if he has died, any expenses incurred by the council or authority in providing for his maintenance in the institution, not being expenses recoverable from any other source "

The executor resisted the claim on the ground that Mrs Black's husband was legally liable to maintain her, if the expenses were recoverable from the husband, they came within the words "recoverable from any other source", being recoverable from another source, they were not recoverable from the executor. The county court judge accepted this view and dismissed the county council's claim. The Court of Appeal, however, points out that the county council has the choice between recovering the expenses from the patient, the person legally liable to maintain the patient, or (if the patient dies) the patient's executor. There was, says the court, no defence to the action. The words "not being expenses recoverable from any other source" refer to something included in a subsequent proviso concerning agreements with the governing bodies of associations or funds established for providing benefits to members. The words might also relate to sums recovered under the Road Traffic Act in cases of road accidents.

Judgment was given for the appellants (the Middlesex county council), and the patient's executor has been prevented from driving a coach and four through the statute. Section 184 of the 1936 Act, it may be recalled, gave the local authority an improved position. It had been prevented (under the previous law now replaced) from recovering expenses at all where the patient was treated in an infectious diseases hospital, it now obtained a power (but not a duty) to recover expenses from an infectious disease patient. Ambulance removal expenses became recoverable, too, whether or no the illness was an infectious disease. The time-limit for recovering expenses was increased from six to twelve months. Finally, recovery out of the patient's estate is no longer affected by the place of death, under the previous law it was barred if the death occurred after discharge from the hospital.

Alleged Negligence of Blind Masseur

A case reported recently in the *Solicitors' Journal* (Williams' Executors *v* Lush) discussed the legal liability of a blind masseur where a burn had been caused during electric diathermy treatment administered on medical advice. A surgeon with several years' experience of the treatment said that burning should not have occurred on the first occasion. A blind masseur was at a disadvantage in not being able to see signs of discomfort in the patient. The defendant, a qualified masseur with twenty years of practice, said the patient had been nervous (as was shown by a cold perspiration), but did not complain of undue heat. After removal of the pads, the skin did not feel abnormal to the defendant's touch. An expert witness from the physiotherapy department at St George's Hospital gave evidence that burns might have been caused even by the low current used. This did not indicate negligence. More burns occurred during treatment by masseurs with sight than where blind masseurs were employed. Arthritis, from which the patient suffered, gave rise to an impoverished lymph and blood supply, they might sometimes cause burning during such treatment.

The Plymouth county court judge observed that there was a conflict of medical evidence as to whether the amount of current used was normally sufficient to cause the burn. The burn was the result of the defendant's treatment, but it had not been proved that the burn could only have been caused by some mistake in the course of the treatment. The plaintiff in consequence had not discharged the burden of establishing his case. Judgment, with costs, was given to the defendant.

Blood-group Tests in Nullity Action

The *Law Journal* of April 25 describes an interesting application in the Divorce Court of blood-group tests. In Wilson *v* Wilson (otherwise Jennings), tried earlier this year, a husband gave evidence that he cohabited with a woman once on June 15, 1940, a few days later she told him that she was pregnant. He married her in the following August and left her shortly afterwards. She bore a full-time child on Jan 8, 1941. Medical evidence established that this child could not possibly have been conceived in the previous June. The husband sued for a declaration of nullity of the marriage—under section 7 (1) (*d*) of the Herbert Act of 1937—on the ground that the respondent was, at the time of the marriage, pregnant by another man.

Dr G Roche Lynch, the *Law Journal* reports, gave evidence that he had grouped the blood of the husband, wife and child, the husband's was OM, the wife's BM and the child's ABN. The factors A and N in the child's blood were unaccounted for. The evidence was conclusive that the husband was not the father. Mr Justice Hodson declared the husband's petition to have been clearly and fully proved, he pronounced a decree of nullity. As the *Law Journal* emphasises, in a petition for divorce where the husband relies for evidence of adultery on the birth of a child of which he denies that he is the father, the rule in the Russell case prevents the husband from giving evidence that, at the time when the child was conceived, he had no access to his wife. But the law permits evidence of non-access to be given from some other source. Such evidence as was produced by the pathologist in the Wilson case may well be sufficient proof of adultery (so that no question of non-access would arise). This may be of great value to petitioners, provided, of course, that the respondent will allow her blood to be tested, and provided that the case is one in which the tests establish that the husband cannot have been the father of the child.

In England Now

A Running Commentary by Peripatetic Correspondents

It was a bit tough to get a hair-raising pamphlet about the dangers of vaccination when our George was a month old and his vaccination had just taken nicely. Fortunately for our peace of mind, though no doubt a good case against the universal compulsory vaccination of infants could be made out, this pamphlet did not carry conviction. Of its three sheets the first was a useful account of the procedure to be adopted in order to contract out of vaccination. The second was a reasonable-sounding summary of the story of postvaccinal encephalitis. If it had stopped at that the pamphlet might have given us a sleepless night or two. But the third sheet contained some quotations from the sayings of medical men both here and abroad—mostly consisting of one sentence with no hint of its context—which were so grotesque as to be entirely reassuring. After all, most of us have been vaccinated ourselves, or at least some of our friends have, and survived, so it is hard to follow the bloke who is alleged to have called vaccination "an infamous crime and a beastly outrage," or the ones who called it "a ghastly risk," "a blunder in poisons," or even "the supreme folly of the Medical Profession" (a folly would have to be pretty high up to be our supreme one). And when a doctor was quoted as saying "I have seen hundreds of children killed by vaccination" we knew that all was well. Either these remarks were so old that they referred to arm-to-arm days, or they were but the echo of the hum of bees in the bonnet. We slept in peace—and so did George.

* * *

It is one of the more likeable characteristics of the average Englishman that, just as he has a somewhat dumb and unæsthetic appreciation of the wild flowers of the countryside, so he has a rather more overt admiration for the birds that either as residents or as migrants are familiar in the intimate setting of his native land. This love of birds is often carried to the extreme that causes the enthusiast who annually announces that he has heard the first notes of the chiff-chaff to be regarded by ordinary people with a benevolent tolerance extended to the misguided but harmless. I am inclined to agree with the ordinary person, and I approve of the ornithologist who heard the cuckoo on a fine day in February—he heard it give its familiar note twelve times in a well-known street in Oxford exactly at noon. But apart from this enthusiasm there are several classes of people who consider themselves entitled to be regarded as bird lovers. There is the genuine field ornithologist who is prepared to spend uncomfortable days in order to study and if possible photograph the intimacies of the family lives of birds. This man will cheerfully lie in an uncomfortable hide amidst bramble and nettles, or conceal himself in the dampness of sand dunes in some grey estuary to learn about the habits of our warblers or our waders. Strangely enough there are those whose interests lead only to the destruction of bird life and who yet claim to be classed as bird lovers. The egg collector and the man who shoots every strange and rare bird he meets we will rule out from any claim to the title. To only one class whose preoccupation is with the killing of birds will I ever extend any sympathy. In this class is the real wildfowler, the man who with some hardihood waits long hours of twilight and dusk in lonely places on deserted marshes or on shore flats to get a shot at flighting ducks and geese. This man takes his limited toll of flighting birds by pitting his patience and cunning against that of birds born and bred in the wild. He endures hardships in his calling, his successes are no real threat to the survival of the flocks of which he takes his toll and the products of his enterprise are an addition to the nation's food-supplies.

There is, however, another class in England that has, with a supreme disregard for the ordinary connotation of the words, arrogated to itself the title of bird lover since it "preserves" game birds. There could be nothing more un-English than to decry this traditional English business of breeding certain birds wholesale in order that they may, during the interval permitted by law, be slaughtered for "sport." It would be as useless to raise objections to this traditional and typically English business as to question the oft-repeated assertion that were horse-racing restricted, or put an end to, the thoroughbred would deteriorate and ultimately become extinct. We are so accustomed to this argument that many of us, even in war-time, have come to accept it as being valid. But fifty years ago I never heard anyone claim that were dog races to be prohibited the breed of greyhounds would die out; I believe neither the one nor the other of these stupid assumptions. Nor do I believe now, since I have resumed my railway journeys through England after an interval of thirty years, that there is anything to be said in favour of the traditional British custom of alienating wide tracts of productive land for the idle business of rearing game birds to be slaughtered wholesale in the name of sport. I will go further than that. Those evils that I have seen in the way of overgrown hedgerows, in the wide dissemination of weeds and in the conspicuous and to an outsider alarming increase in the rabbit population are, I believe, the direct outcome of this alienation of so large a proportion of our potentially food-producing land for the purpose of preserving game. I am by no means alone in this opinion. I quote from an article published before the outbreak of war: "The land and what it can produce may make the difference between life and death to us. The land can no longer be treated as a playground. Farming for sport at the land's expense must stop."

Unfortunately there is more than the loss of the land and the deterioration of lands adjacent to these areas farmed only for sport. If game is to be preserved until it is ripe for wholesale slaughter there must be custodians of the game and of the broad acres on which game is preserved. Now gamekeepers, as a class, rank among the most admirable of mankind. They are steeped in nature lore, good observers of wild life, lovers of the countryside and are, as a rule, keen students of the ways of men either as masters or as poachers. Richard Jefferies, in his "Gamekeeper at Home," has endeared the typical race of these men to his readers for all time. But in the economic consideration of the land of Britain the gamekeeper is not only an anachronism but an unmitigated curse. During the last war many gamekeepers were called on to undertake duties more directly utilitarian than those they were accustomed to in peace time. The result was that many of their traditional enemies succeeded in multiplying. Owls, hawks and birds of prey increased once the gamekeeper's gun was deflected from them. The owls and hawks had close season in which they could carry on their beneficial work of ridding the fields and barns of mice and voles and sparrows. The kestrel hovered in peace, a beautiful thing to see and a preserver of our crops from the lesser fry of the army of destruction. The sparrow hawk was free to sneak along the hedgerows at harvest time; free to snatch a sparrow from the thousands lurking in the overgrown hedges waiting to take their toll of the ripening grain. Native vermin-hunting mammals had their chance to increase: polecats and stoats were no longer nailed to the doors of barns but were left to deal with the rabbit and the rat. Weasels were free to take their toll of the vast and destructive armies of mice.

But all this was changed when the gamekeeper returned to his duties. England once more was farmed "for sport." As I look from the windows of my railway carriage I see more and more of England "farmed with the main eye on the shooting rights," more and more of England gone out of useful cultivation. The panic ploughing of poor land in order to earn a bonus is no real remedy. It is the "preserver" of game, the shooting syndicates and the gamekeeper and not the agriculturist who farm so much of our fair land. In one European country the people have been offered the choice of guns or butter; we have been given no choice, but the alternatives facing us for the future of England are bread or battues, grain or game.

* * *

After the clinic on Tuesdays we two, a bit tired and snappy, have a late supper. What have we got tonight—cottage-pie? Shall I turn the wireless on, it's the Brains Trust? Any meat in it, it's we who have to do the trusting. No, just the same as usual, that's Joad. I say, what nonsense he talked the other night about the expression of the emotions, d'you remember? I've found a bit of tripe, yes, but with complete assurance. Oh absolutely, he must have realised it himself, for he devoted a "second thoughts" to it, just a verbal smoke-screen. They've put a lot of condiment into this, sort of disguise. Of course, he's a word-thinker. Visual or auditory? Greens and potatoes, fifty fifty. Oh, there's Campbell; I say do you think he has really had all those wonderful experiences? Pass the salt, please. No, that bit's not meat, only ersatz rabbit, what the alienists call "confabulation." And the psychic experiences? I don't know why these wineglasses are here, there's nothing to put in them; psychic experiences are 1, a form of snobbery (I met a duke or a spirit); 2, an over-reaction from flesh and mammon; 3, atavistic credulity. Sorry, old boy, but that sounds awfully like Joad. What about those repetitions and parrot phrases: "It seems to me, in my opinion, what I mean to say is, I do most certainly think——" These rolls are hollow; that's just to fill up thought vacuoles, old lad. Ah, roly-poly, but he does come out with plain horse-sense sometimes. Here's a currant. Wonder they don't get King-Hall again, have some real cheese. Like a character from Marryat, wasn't he? Yes, but this old biscuit comes from W. W. Jacobs. Will you say grace. O Gad, we've had of pie and dough enough, of Joad a load, of Campbell ample. Amen. Definitely.

* * *

In normal times, when the smoker has not developed such awful habits as blowing his fœtid expired smoke into my face in the middle of a conversation or even of a meal, tapping the ash over my shoulder if not down my neck, burning holes in the tablecloth, leaving a smoking cigarette-end in an ash-tray under my nose, or simply burning a hole in the seat of my trousers, I do not object to smoking. But nowadays, when so many people are rendered bad tempered through lack of a cigarette when the itch to smoke is on them surely it is plain what a slave man has become to this habit. Let us look into the causes. The first desire to smoke comes from the small boy's eagerness to copy his elders, stimulated by the taboo on smoking at that age. In adolescence embarrassment in company is dispelled if the hands can be employed, and smoking a cigarette or a pipe is the accepted way of doing this in society. Whittling a stick would be equally effective, but might make more of a mess of the carpet. The drug is said to have a calming influence on the nerves, but I have yet to see a non-smoker who is not as calm as a smoker in a crisis. Whether the habit has an injurious effect on the health is a point on which opinions differ enough to bewilder the Minister of Health who is now Chancellor. But it certainly causes such minor maladies as sore throat and dry cough, and it certainly irritates a peptic ulcer. Besides which a smoker gets a far worse hang-over than a non-smoker after the same celebration. According to the budget £33 million is spent annually on tobacco, which gives a startling idea of the amount of shipping space that might have been used for food. Yet smokers do not seem to bother about saving tobacco, let alone reducing the number of matches they waste. Pipe-smokers may pass on the first score but certainly not on the second, while cigarette-smokers must waste on the average a quarter of all the tobacco they smoke. Why have they even yet after nearly three years of war, not produced a cigarette with a ½ in. paper tube on one end, as they have always had in Russia and also in Germany after the last war? And what about double-ended matches?

The immediate reason for this diatribe against the smoker is that I have just had the back of my hand burnt by a cigarette in a crowded mess, and before I could turn round to indulge in a little justifiable abuse the owner of the cigarette, already craving for another inhalation, was registering indignation at his cigarette having been extinguished.

* * *

What do they do with umbilical cords these days? A friend of mine was doing his midwifery when he observed a beauty, fifty-five inches long, coiled thrice round the neck and once round the chest. He wanted to keep the thing, but before he could say so a nurse had wrung the blood out of it and dropped it into a bottle of acetone. It was going to be sent, she said, to Bushey. He has an idea it may be made into munitions.

DENTAL DILEMMAS

POSTWAR reconstruction is now the vogue, and Mr Edward Samson has given much travail and thought to the future of dentistry (*Facing the Facts*. London: J. S. Cottrell. Pp. 99. 10*s*. 6*d*.) He exposes the abuses of dental benefit under the NHI scheme and probes the weaknesses of our school dental and infant welfare services, and the lack of care for adolescents. But can he really think that mechanical dentistry is more remunerative than conservative or operative dentistry? If, after the war, the task of providing dentures and appliances is placed in the hands of a separate branch of the profession, then the operative dentist will surely prosper; but private practice may dwindle in any case. Dentists, however, are relatively so scarce that a large access to their numbers will be needed before reconstruction can begin. It has been estimated that nearly half a million was spent by the Dental Board since it was created in 1921, in education grants to help boys to become dentists. But these have been discontinued, at least for "the duration." If the NHI scale of fees for dentistry provided a better living (Mr Samson puts existing remuneration at £400 a year gross, on the average, earned by excessive hours of labour) sufficient boys would probably be forthcoming and the money offered to attract entrants, if it again becomes available, could be spent on better equipment for dental hospitals, on special dental departments for general hospitals, on enlarged teaching staff and research. Mr Samson notes that an assurance company with a membership of 3,000,000 has blamed neglect of dental trouble for half the ill health found in industrial classes, and this despite vast sums spent on dental benefit. Profits from the sale of his book—which every thoughtful dentist will want to read—are to go to the British Red Cross Society.

Mr A. Cornford Bowden, writing on the same theme (*Medicine Today and Tomorrow*, 1942, 3, 4) pictures a future of socialised dentistry. He would like dental students to be given a good general grounding and then the opportunity of specialising. Thus some would attain medical standard in anatomy, physiology, pathology and bacteriology, and study surgery of the head and neck; others would follow pure dentistry specialising in prosthetics, orthodontics, or crown and bridge work. But he is strongly opposed to the idea of two grades of dentist, insisting that skilled prosthetics requires not only deftness but sound knowledge of anatomy and physiology. He would like to see dentists working as a group at health centres under the eye of a director who would see that the standard of work was maintained. These general practitioner clinics would send difficult surgical cases and those needing advanced technical procedures in orthodontics or restoration work to a special centre in or near the local hospital. This would be staffed by experts who would cooperate with the medical and surgical staff of the hospital, undertaking with them the treatment of jaw fractures, maxillofacial injuries and cleft palate, carrying out minor dental and oral surgery, and making radium boxes for the treatment of cancer of the mouth. This industrious picture, however, is clouded by the lack of personnel to carry it out. Like Mr Samson, Mr Bowden asks first for more dentists.

Letters to the Editor

WHY NOT AN ADOLESCENTS HOSPITAL?

SIR,—Children's hospitals are special hospitals. So are urological, ophthalmological, dental, mental and half a score beside. Some people of importance and influence in the hospital world are saying that there is no need for "special departments" in the teaching hospitals. Consolidate, strengthen, expand, amalgamate the special hospitals in their groups, send the students thither, and how much the financial burden on the governors of the general hospitals will be eased!

The professor of medicine has already been robbed of mental disease, infectious disease, a great part of pulmonary disease, some part of endocrine disease, the care of the child up to the age of (say) five, ten, or fifteen, the care of the aged and infirm. Why not go a step or two further and deprive him of everything except his laboratory and his chair? If it be logical to take from the professor of surgery his neurology, urology, injury, repair, and half a dozen other snippets such as fistula (for which there is a hospital designate) why not sequester another age-group, the adolescent, and make it a specialty? There are problems, physical and psychological peculiar to that decade; surely some doctors can be found to restrict their interests and research to it.

Of course, once the hospital is established the adolescent specialists will find they need an ophthalmologist, a laryngologist, an obstetrician, a general surgeon (if such there be), just as the children's hospital, the mental hospital and all the other special hospitals need, at least on occasion, representatives of all the other special departments.

Why not? Why not change with the changing times and have nothing but special hospitals, allowing the professors of medicine, surgery and obstetrics, in their humble and unimportant capacities, to figure at the bottom of the list of staff as a tribute to an outmoded past?

A LOOKER ON

CALCIUM IN BREAD

SIR,—In a recent letter to the *Times* Sir Edward Mellanby defends the adulteration of bread with chalk, and makes several statements which should not be allowed to pass unchallenged, but which are more suitable for discussion in a professional than in a lay journal. He raises once again what Sir Frederick Keeble has called the phytic-acid bogy, which has made sporadic appearances during the last year or two. Bread of high extraction contains more phytic acid than white bread, but it also contains more calcium; and the fixation of calcium by the phytic acid is, according to one investigation, reduced by association with fat. The chief source of calcium is dairy produce. If, on account of shortage, it is necessary to attempt to augment the intake of calcium, natural substitutes should as far as possible be utilised. Is there satisfactory evidence that much or any of the chalk added to bread actually reaches the tissues? Clinical experience indicates that it does not.

Sir Edward states that the consumption of the 85% flour, without additional calcium, would probably make the people's teeth even worse. Structure is no doubt an important element in the resistance to dental decay, but the label, deficiency disease, now often attached to it, connotes a simple and complete explanation of the causation. This implication is incorrect: the pathology is complex. Cereals, the staff of life, must inevitably be an important factor in a balanced diet. They need not produce decay. There is reason to believe that people in other countries living under simple conditions on a diet consisting largely of rye bread suffer little from decay. A sufficiency of calcium, in conjunction with phosphorus and the necessary vitamins, is of course of paramount importance in the first decade of life, and before. In children and adults the ravages of decay can be checked by a change of diet, and there may even be a kind of reparative process induced. I do not know any evidence to show that mere addition of calcium to the diet will effect this. Decay always begins on the surface of a tooth. No proof that the calcium content of the external enamel can be increased or reduced after it has been fully formed has been given; the implication that the incidence of dental decay, apart from structure, can be affected by lack of calcium is therefore untenable

The addition of chalk to bread, whether necessary or not, is pernicious in principle, because it encourages the idea that the introduction of foreign substances into food is permissible, and the belief, already too prevalent, that the products of the laboratory form an adequate substitute for those of the soil and of the sun The chief use of prepared chalk hitherto has been as the basis of dentifrices The amount that it is proposed to add is small Would it not meet the case if people were instructed to swallow a calculated quantity of their toothpaste every evening—or would this be regarded as unfair to those who do not habitually use a tooth-brush ?

London, W 1   NORMAN BENNETT

"RAT VIRUS"

SIR,—In your issue of April 18 Mr McLachlan writes on the use of "viruses" in rat control One of the main questions is whether the bacterial strains used for this purpose are identical with those which are known to be pathogenic for human beings Two years ago we had an opportunity of examining the six principal cultures which are at present used for rat and mouse control in Great Britain Pending a full account of this investigation a brief summary of the findings may be of interest By means of reciprocal absorption tests all six of these strains were found to be serologically identical with *Salmonella enteritidis* Gaertner Moreover the fermentation tests which can be used to divide these serologically identical types into sub-groups showed that four of these "viruses" could be classified as var *Danysz*, while the remaining two could not be differentiated from the classical Jena (or Gaertner) type In primary platings of the raw material five of the strains showed various gradations between smoothness and roughness—hardly surprising, since many of them must by now have been cultivated on laboratory media for years—and this tendency towards roughness might be expected to reduce virulence

It is well known that *S enteritidis*, including var *Danysz*, is one of the commonest causes of salmonella food poisoning, and recent observations leave no doubt that strains of both these sub-groups are pathogenic to man The evidence that "virus" preparations have given rise to cases of human illness appears to us to be conclusive (Reference below to a few of the more important papers) The real crux of the problem is whether there is an equally or more efficient method of controlling rats and mice without danger for human beings Several efficacious methods of administering poison baits without danger to man and domestic animals have been developed and are already in use by Government departments, which have issued explanatory leaflets to the public

Bureau of Animal Population,
Oxford University
P H LESLIE,
C ELTON

REFERENCES—Boecker, E and Kauffmann, F *Dtsch med Wschr* 1930 56 1339—Kristensen M and Bojlén, K *Hospitalstidende* 1931 74, 489—Spray R S *J Amer med Ass* 1926, 86, 109—Willfuhr and Wendtlandt, *Z Hyg InfektKr* 1921, 94, 192—Wreschner H *Ibid*, 1921, 93, 35

TRICHLORETHYLENE

SIR,—Trichlorethylene, of which Dr Griffiths gave us an encouraging report in your issue of April 25, seems likely to prove useful in those cases where a general anæsthetic is necessary for peroral endoscopic operations and in which chloroform, ether, gas and oxygen, cyclopropane and the intravenous barbiturates all have their objections Trichlorethylene seems to meet the requirements admirably—it does not excite mucous secretion, is non-irritating to the lungs, non-inflammable and non-explosive in any dilution, electrocardiographic investigations so far carried out give no indication that it will produce ventricular fibrillation, and recovery from it is rapid and singularly devoid of unpleasant sequelæ Here is an illustrative case

A boy aged 2½ years was admitted with a history of a choking attack while eating a peanut on the preceding afternoon, he had had a cough for several weeks previously T 98° F, P 130, R 30 Slight stridor, moist sounds all over chest and sligh[illegible] over left base X ray films [illegible] showed left base unchanged FB in left bronchus Bronchoscopic removal was decided on and lack of coöperation indicated a general anæsthetic, which I viewed with some misgivings in view of his chest condition

Induction with trichlorethylene by means of a Blomfield's modification of a Schimmelbusch mask connected to a Boyle's apparatus, the chloroform bottle of which was used for the trichlorethylene which was vaporised by a stream of nitrous oxide and oxygen, the former merely as a vehicle Induction was smooth and after the bronchoscope was passed I connected the anæsthetic tube to the side tube of the bronchoscope At this stage the oxygen alone produced a sufficient vapour strength to maintain perfectly satisfactory anæsthesia This was tranquil, there was no mucous secretion and the colour was excellent There was some increase in the rate of respiration, but this did not cause any inconvenience The foreign body was seen and moved some distance, but extraction failed because the field was obscured by blood

During the night the child had a violent fit of coughing and appeared to swallow something His condition was so much better the next morning that another X-ray examination was done which showed that both lungs were aerating well There was no exacerbation of the bronchitis and the child's condition rapidly improved There was no vomiting

I feel that a severe test such as this justifies a further trial of trichlorethylene in this type of case, and I have in fact since had a similar case of a metallic foreign body in the bronchus of a child of 3 years in which the anæsthetic was equally satisfactory Though all available evidence is to the contrary there are some who suggest that trichlorethylene may produce liver damage, but if so oxygen should afford the same protection as it does with chloroform and vinyl ether

Aylesbury   H W LOFTUS DALE

PERFORATED PEPTIC ULCER

SIR,—In the middle of last century the number of perforated ulcers in girls aged 15–20 was approximately equal to that in the entire male sex Brinton's (1857) series of 63 perforations in girls aged 15–20 inclusive and 60 in men aged 0–90 is representative of the records of that period By 1935, ulcer in girls had become so rare that it is only possible to guess its incidence at something like 1 in 500–1000 perforations Mr Stewart and Mr Winser tentatively suggest that this change in ratio could have been brought about by an increase in the number of male perforations while those in girls remained constant In favour of this they state that Brunner collected only 170 cases of perforations in young women in 50 years up to 1903 and that therefore the absolute incidence need not have been very high They are not quite accurate Brunner's cases were all operation cases—i e, dating from 1893—and if they verify his references they will find that most of them occurred between 1895 and 1901 This literature will also confirm my statement that these perforations were a commonplace in the large city hospitals then, whereas today with motor ambulances serving a much larger population they are rare In my paper (*Lancet*, 1940, i, 395 and 444) I give my reasons for ascribing the major part of this change in incidence to ulcers in young girls ceasing to occur, but I also estimated the increase in incidence in male perforations at 300–600% Possibly these limits should be even wider

I cannot accept the conclusion that anxiety causes perforation via the hypothalamic mechanism because this theory doesn't explain to me the age- and sex-distribution in Victorian times, or that in a London blitz, or the considerably greater absolute numbers of perforations in girls in Victorian times than in a blitz The rarity of perforations in the fighting services under dangerous conditions, the facts of geographical distribution, the life history of ulcer, and a comparison of what happens in animal experimental work with what seems to happen in man are further objections

The important thing which the paper of Stewart and Winser demonstrated was not that anxiety was important but that the combination of fear, worry, irregular sleep, food, bowel habits, &c, oversmoking and irregular nips of spirits were not important enough They only succeeded in doubling the incidence of perforations and had no effect at all on their distribution, thus suggesting that only the group already predisposed to perforation were affected What we are looking for is factors which will alter the distribution of perforations and their incidence fourfold or tenfold comparable with what has happened since last century

We are it seems to me in the position of an experimental community of guineapigs fed on a diet which produces 5% of scurvy Guineapig doctors could discover that heredity determined which 5% developed scurvy They might find that habits like smoking and drinking which affect the absorption of vitamin C predisposed to scurvy They might find a certain temperament or constitution linked with the heritable liability to scurvy But if like our doctors they are trained on frogs and dogfish rather than on fundamental biological theory, they would be very unlikely to suspect the diet because they would argue "We all eat the same things and only a few of us get scurvy" *Perforated* ulcer in young women was not obviously familial and was generally thought to be due to bad hygienic conditions which affected them and not the rest of the community. Perforated duodenal ulcer in man is to a large extent a familial disease, and so we ought to think of some cause which affects the whole community and to which these individuals are hereditarily more susceptible The adaptation of the gut of different species to different diets and to different habits of feeding is the result of thousands of years of selection during which guts which didn't adapt themselves were at a disadvantage. And if we suddenly change our habits of living as we have done in the last century it is not surprising if certain individuals have to undergo the uncomfortable experience of being naturally selected out

Royal Society of Medicine **DENYS JENNINGS**

MIDDLE MENINGEAL HÆMORRHAGE

SIR,—There is to be read in Montaigne's *Essays* (Bordeaux 1580) an interesting account of the dramatic death of one of his brothers From the careful record it would seem that this was due to a hæmorrhage from the middle meningeal artery It appears in the long and rather gloomy chapter entitled Que Philosopher c'est apprendre a mourir, and (in Florio's translation) runs as follows

> "And if amongst these examples, I may adde one of a brother of mine, called Captaine Saint Martin, a man of three and twentie yeares of age, who had alreadie given good testimonie of his worth and forward valour, playing at tennis, received a blow with a ball, that hit him a little above the right eare, without apparance of any contusion, bruse, or hurt, and never sitting or resting upon it, died within six houres after of an Apoplexie, which the blow of the ball caused in him"

I have not seen the reference in medical literature, and at a time when the prompt recognition of such an accident may lead to effective surgical treatment you may think it worth reproduction

Cambridge **C MAX PAGE**

NEUROSIS IN SOLDIERS

SIR,—In the article by Dr Aubrey Lewis and Dr Eliot Slater in your issue of April 25 describing a follow-up study of neuroses in soldiers, an omission of an astonishing nature is evident in the failure to include any consideration of the influence of treatment among the other factors they deal with

Results were investigated in two groups each of 150 soldiers discharged from hospital to their units, by comparing the sample 150 who "made good," remaining with their units on full duty after several months, with the other similar sample who broke down again and had to be discharged from the Army In the endeavour to work out factors which would be of value in assessing prognosis the authors drew up a list of 20 attributes and compared their incidence in the two groups Criticism could readily be formulated of the validity of this list of qualities, but the point I should like to stress is the omission of any reference to the effect of treatment in their study of prognostic indications If the 300 cases were all given the same kind and degree of treatment it would then be a neutral factor to which it would be unnecessary to give any special weight But the authors do not say that this was so and it is in any case exceedingly unlikely, if not impossible, in a series of 300 patients, the probability is that the various cases were given different kinds and degrees of treatment. From other remarks in the article the assumption is clear that the authors believe that treatment does influence results, yet they entirely exclude it from their estimate of prognostic factors Such an investigation can have no scientific value when an essential variable has been left out of consideration

Harley Street, W 1 **FREDERICK DILLON**

GINGIVITIS

SIR,—In their letter of Jan 31 Dr Stuhl and Mr Coventry state that "Gum and throat swabs seldom revealed a Vincent's infection" The clinical picture of painful gums, fœtid discharge, &c, they describe is typical of the cases of Vincent's infection in civilians which we are treating at the Birmingham Dental Hospital In the past, bacteriological examination so consistently revealed Vincent's organisms in large numbers that for some time we have not taken smears owing to shortage of laboratory staff, but the findings of Dr Stuhl and Mr Coventry prompted the bacteriological examination of some recent cases to determine whether or not any change in the type of infection had occurred

Three smears were taken from each of 20 consecutive new cases, one from the surface of the slough and two from the base of the ulcer The bacteriological examination was carried out in the Dental Research Laboratory of Birmingham University The surface smear and one deep smear were stained by the Giemsa method and the other deep smear with carbol fuchsin, the summarised results were as follows The smears of one case were spoiled in transit, and of the remaining 19 all showed fusiform bacilli and spirochætes in at least one of the three smears, 11 of the surface smears stained Giemsa were positive, 3 were poor smears and therefore inconclusive, 5 were negative, 17 of the deep smears stained Giemsa were positive, the remaining 2 were poor smears, but the other deep smears from these 2 cases stained carbol fuchsin were positive In addition to Vincent's organisms, cocci, bacilli and thread forms in varying numbers were observed in all the smears Carbol fuchsin is a useful stain for quick routine examination of smears but it is not infallible and failure to find the organisms is not conclusive Giemsa stain is much more reliable but has the disadvantage that the correct technique requires 12–24 hours In 15 cases, fusiform bacilli and spirochætes were very numerous and deeply stained and these cases exhibited the clinical picture of severe acute ulceration In the remaining 4 cases the organisms were scanty and took the stain very faintly, the spirochætes particularly appearing to be degenerating In one of these cases some very large and thick spirochætes were observed in addition to the typical ones The clinical diagnosis in these 4 cases was that of chronic or subacute Vincent's infection The conclusion we have reached, therefore, is that numerous virulent (shown by the intense staining) Vincent's organisms can always be demonstrated by suitable stains in acute cases, but that in chronic or subacute cases the organisms are scanty and are very difficult to find owing to their poor staining qualities It appears probable that the majority of the cases observed by Dr Stuhl and Mr Coventry belonged to the latter class If this supposition is correct it offers a possible explanation of the good results they achieve in treatment by administering large doses of ascorbic acid

Our observations on the treatment of a considerable number of Vincent's cases—over 350 were recorded in the last six months of 1941—indicate that ascorbic-acid therapy alone is almost valueless but that in combination with suitable local treatment the total treatment time in many cases is appreciably reduced This is particularly noticeable in longstanding cases and in this respect our findings are in line with those of Dr Stuhl and Mr Coventry Our experience with nicotinic acid is very similar, and we are therefore unable to support the wide claims for this therapy made by Captain J D King (*Lancet*, 1941, ii, 293) In our expereience the primary necessity in treatment is the thorough cleansing of the area, including removal of slough and calculus, at the *earliest possible moment* Often it is necessary to paint the painful gums with a surface anæsthetic to achieve this result Unaffected parts of the mouth must not be touched lest possible trauma cause a spread of the infection In conjunction with cleansing, various local applications have been tried with consistently good results, 10% chromic acid followed by hydrogen peroxide, brilliant green and crystal violet, and acriflavine gave good though rather slow results, 20% chromic acid followed by H_2O_2 was definitely better than any of the preceding remedies and promoted much more rapid healing in acute cases Subacute forms of the disease confined to the interdental papillæ are best treated by packing with zinc oxide and oil of cloves paste on cotton-wool wisps

We have found that the administration of the time-honoured drug potassium chlorate in gr 10–15 doses t d s greatly accelerates the beneficial effect of all these local treatments and this is now a routine procedure Immediately clinical ulceration is eliminated, usually in 3–5 days, necessary extractions, irradication of parodontal pockets by cautery or gingivectomy, and removal of other possible foci of infection must be carried out to prevent recurrence and at the same time general bodily resistance must be raised In the latter connexion vitamin therapy is of undoubted value, but in the absence of adequate facilities for determining vitamin deficiencies it must be empirical A suitable tonic seems to be of equal or perhaps greater value in the majority of cases

Recurrences have been remarkably few, and most of those that have occurred can be traced to the failure of the patient to complete the full course of treatment

Parodontal Department,
Birmingham Dental Hospital　A FRANK STAMMERS

SEX AND TABOO

SIR,—Although there has been a general improvement in the method of sex instruction used in schools, this difficult problem is not always skilfully handled Too often sex instruction is combined with a talk on ethical behaviour, and it sometimes even forms part of preparation for confirmation in the school chapel As a result a boy often gets the impression that all manifestations of sexuality are essentially immoral Sexuality is linked up with important moral issues, but it is a mistake to introduce the subject under the heading of ethics If this is done a boy with a sense of humour may treat the whole matter as a ribald joke, or a too sensitive boy may acquire the impression that all manifestations of sexuality are impure In my opinion Mr Faint strikes the right note If others who are responsible for the education of adolescents showed similar skill there would undoubtedly be a drop in the number of unhappy and badly adjusted men who are later compelled to consult doctors on account of sexual difficulties

Harley Street, W　KENNETH WALKER

DOSAGE OF INSULIN

SIR,—The suggestion made by Dr Barnard in his letter of March 28—the standardisation of all insulin to double strength and the marking of syringes to correspond in order to avoid errors in dosage—is open to a great deal of criticism It involves inconveniencing thousands to please a few His statement that zinc protamine insulin has always been so standardised is, of course, incorrect ZPI has been available in single, double and quadruple strengths for some years now

The inconvenience of bulky injections is certainly a source of great discomfort to some diabetics With a view to removing this disadvantage, quadruple strength insulin was introduced There are no advantages to be gained by depriving the diabetic of his quadruple insulin, which to him represents as great a discovery as the original discovery of insulin itself

Medical School, Guy's Hospital　GEORGE R W N LUNTZ

PROGRESS IN BURN THERAPY

SIR,—In the opening sentence of a leading article in your issue of April 25 it is stated that "in the whole of the last war THE LANCET published but one original article on burns—that by Wakeley in 1918 on skin-grafting" This is wrong, for in 1916 (*Lancet*, ii, 56) I published with W M Ash a report on the Jutland Coast casualties, in which burns figured very heavily As this article has been quoted extensively in America I think the statement should not go unchallenged

CECIL P G WAKELEY

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS M P

THE week I am recording began with the debate on Sir Stafford Cripps's mission to India—the mission which failed of its immediate purpose but which nevertheless blazed the way for a future advance to a permanent settlement We discussed also war damage and the Minister of Works and Planning Bill Planning is much talked of in these days and much spoken of in the House of Commons and at public meetings But it is not really loved, at least not for itself alone There are so many planners and they want contradictory things If the Government made up its mind as to just what it wanted, planning would be easier But both the men especially associated with big scale planning—Sir John Reith and Mr Arthur Greenwood—have gone from the Government The bill discussed this week is a new start The planning of the use of land, the location of factories and industries generally, of cities and the safeguarding "beauty-spots" is clearly the foundation of post-war policy On this planning will depend the health and well-being of the nation, the distribution of its population, the nature of its industries and agriculture The bill before the House takes a few steps in that direction but will need to be supplemented by big further changes

Mr Henry Strauss, the joint parliamentary secretary to the Ministry of Works and Buildings, in introducing the measure described it as "the first step only" of the Government's policy But Mr Strauss seemed more especially concerned with the æsthetic side of the question, the folly of squandering the "matchless but most vulnerable beauty" of this island with sporadic ill-designed buildings, the need to preserve areas of natural beauty and of the coast-line Essential as these aims are it is clear that they cannot be achieved apart from a rational balance of the use of land for agriculture and the distribution of industries over the land The extent and spread of cities depends on industries whose location has been uncontrolled And blocks of developing estates eat into the countryside like cancer-cells into healthy tissue

Mr Arthur Greenwood, whose removal from office has given rise to so much comment, spoke of the bill as "the preamble to further steps" He said we must proceed to the building up of "a body of legislation affecting physical planning on a scale which this country has never known before" Planning could not be, according to Mr Greenwood, a single ministerial responsibility It must be the affair of a body of ministers who would be a national development authority and carry out cabinet decisions Sir Robert Tasker, Conservative M P for Holborn, and an architect, did not like the bill and moved its rejection as not comprehensive enough

Mr R D Denman put his finger on the central difficulty when he said the Government were reluctant to realise planning "They seem not able even to plan a planning authority, which is perhaps the first step that should be taken," and he thought that they should not proceed by improvisation "It seems that the routine of the Government is, first, to reject or ignore quite sensible proposals made in the House; second, to get into a mess, and third, having got into a mess to call in Sir William Beveridge to get them out of it Planning has not yet reached the Beveridge stage, but there is real danger that it will"

Mr Austin Hopkinson made one of those witty and penetrating speeches which the House enjoys but which are not often constructive Mr Hopkinson does not like planning by the Superior Person He pointed to the Albert Memorial—once regarded by popular opinion as superior to the Parthenon—as a warning of the impermanence of æsthetic standards We had, according to this member, neither the data to go on nor the idea of what we are planning for and so could not design our planning

Sir William Jowitt, who is now paymaster-general and has replaced Mr Greenwood as Minister in charge of planning activities, said that the essence of the powers transferred under the new bill were local powers and pointed to the great difficulties of the future He agreed that the "central directive must come from that Committee of Ministers over which I preside "—so the Government have fairly and squarely accepted the responsibility of planning as a main issue of policy How health, industrial production and agricultural production will be balanced remains to be seen But scientific direction in many departments of national life is looked at askance If planning under these new powers is to be truly effective it should be directed by an expert body of the scientific standing of the Medical or Agricultural Research Councils

FROM THE PRESS GALLERY

Tribunals for Pension Claims

In the House of Commons on April 29 Mr Rhys Davies challenged the Government's title to determine a man's claims to a pension, after discharge from the Forces, on medical evidence alone—evidence, moreover, given by a doctor paid by the Ministry of Pensions He compared this procedure with a workmen's compensation case, where the trade union called in a doctor to give evidence on behalf of the man The insurance company, represented by the employer, would also have a doctor in court, and the two would probably contradict each other A body of laymen would then decide on the two, probably contradictory, pieces of medical evidence Mr Davies cited the case of a man who was in an asylum while his wife and five children under ten were on poor-law relief In spite of all the medical evidence from Harley Street and the Ministry of Pensions, the fact that this man was insane, and his wife and children on the poor-law, affected the whole community where this family lived He knew of an approved society from which 16,000 young men had been taken into the Forces Already 800 had been discharged on medical grounds Of these 142 were passed A1 on embodiment, but they had not been granted any allowance from the ministry According to the society's records they had never ailed until they were forced into the Forces But the fault did not lie exclusively with the ministry, indeed, they were but administrating probably as generously as possible the Royal Warrant for which Parliament itself was responsible The sheer inefficiency of the recruiting medical boards was also blameworthy Doctors were paid to pass men into the Services, and others were paid to pass out men who ought never to have been accepted As chairman of the South-East Lancashire Mental Welfare Association, Mr Davies had been astonished to find that medical boards were passing registered mental deficients into the Forces Medical opinion, he held, should not be the final factor in a claim for a pension Tribunals should be set up and their establishment should not be postponed until after the war Mr S S Silverman urged that it was not fair to put on the man the onus of proof that his incapacity had been caused or aggravated by war service Above all, the ministry's insistence that they are to be judge and witness of their own cause aroused bitterness It was said that there were not enough doctors to set up tribunals, but medical evidence can be put before a non-medical tribunal County-court judges, for instance, determined almost precisely analogous cases under the Workmen's Compensation Act

Sir Walter Womersley, in reply, said that his department tried within the limits of their legal powers to administer these matters sympathetically From the beginning they had had a good deal of trouble over the medical examination of recruits In the rush of the early days of the war men called back to the army from the Reserve were not given medical examination, and there was no proper medical examination of the men of the Territorial Army when they were embodied Men had been passed into the army A1 who were only in a few days or a few weeks before they were found to be suffering from illnesses, not rendering them unfit for civilian occupations, but unfit for army service The army authorities wisely discharged them On the other hand some men, who were passed A1 and afterwards found to be unfit for service, had had their constitutional diseases aggravated by being in the Services The medical boards were under the Minister of Labour who, when his attention was called to the matter, took action at once, and now we had a better examination of recruits But there were bound to be cases of men with constitutional diseases—such as cancer—which did not manifest themselves at the time of the medical examination. Under the arrangements which he had announced to the House last July, where a man had been passed into the army as A1, and was afterwards discharged because of some constitutional disease if there was any degree of aggravation at all—and it was not for every man to provide proof—the ministry accepted it as a material aggravation and brought it within the provisions of the Royal Warrant The ministry reviewed all cases to which their attention was called from the beginning of the war, and they were able to accept over 70% for pension purposes When a case was brought to his department it was dealt with by expert laymen, and not by medical men as some members seemed to think But of course the laymen were bound to seek the advice of the medical branch of the ministry, because most of these cases hung entirely on medical opinion If the doctors rejected a man's case, he had a right of appeal to the minister If a man submitted a certificate from his own doctor, or from a panel doctor, which gave a different opinion from that of the ministry doctors, the case was submitted to a nominee of the presidents of the Royal Colleges of Physicians or Surgeons Many of these specialist decisions had been in favour of the men's doctors, some in favour of the ministry's doctors, but in any case it was an impartial opinion and as fair as it was possible to get It was laid down by act of Parliament that one medical man must sit on any tribunal He had searched far and wide, and had inquired from all the other Government departments, including the Ministry of Health and the Shakespeare Committee, and everywhere he had been told that doctors were not available That was the only reason why the tribunals had not been set up But he pledged his word that as soon as practicable these tribunals would be set up In the meantime, no one was losing his case because the tribunals were not in existence

QUESTION TIME

Mass Radiography

Mr G Ridley asked the Minister of Labour whether he had given further consideration to the use of mass radiography for the discovery of pulmonary tuberculosis among men and women called up for the Services, and whether he will not adopt this method of examination by medical boards—Mr Ernest Bevin replied I have given careful consideration to this matter and have now received a further report (published as a White Paper) from the medical advisory committee which meets under Lord Horder's chairmanship and which advises me on medical questions connected with the work of the medical boards It is clear from the investigation that it would be impracticable to establish this method of examination at the medical boards throughout the country On the other hand, the concentration of Service personnel at suitable depots has afforded an opportunity for carrying out these examinations to the extent that the necessary apparatus can be provided

Sir Francis Fremantle Does the minister realise that it is important to press on with trying to get this made into a general procedure, in order to reduce the amount of invaliding from the Services and hardship to the men concerned ?—Mr Bevin The report shows that such steps are being taken It is purely a question of method There are so many medical boards in the country that I could not possibly get enough apparatus or facilities to take the procedure to each medical board, and therefore the other arrangement has been made—Sir F Fremantle Have steps been taken to see that men are available who can read the results of these X rays and be sure that they are valuable ?—Mr Bevin I have every confidence in the medical profession

Mosquito Control

Mr F C R Douglas asked the Home Secretary whether he was aware that considerable inconvenience and suffering was caused last summer, particularly to women, by the prevalence of mosquitoes, and what steps he had taken, or proposed to take, in order to prevent mosquitoes from breeding in open tanks and reservoirs of static water kept for fire fighting—Mr Herbert Morrison replied After consultation with the Ministry of Health, instructions have been issued to prevent mosquitoes from breeding in water storage tanks or basins provided for fire fighting, and to prevent the water becoming a nuisance or danger to health These measures include regular inspection and the spraying of the surface of the water from April to September with oil If the medical officer of health considers it advisable a tank or basin would be emptied cleansed and refilled Mr J H MARTIN Will the minister see that local authorities carry out their duties in this respect ?—Mr MORRISON I will do my best

Typhus

Replying to Sir P HURD, Mr E BROWN said The prevalence of typhus in certain parts of Europe calls for the continuance of precautions All port health and riparian authorities are being advised to secure that all persons on board any ship arriving from a continental or North African port, including the crew, should be medically inspected at the first port in this country at which passengers or members of the crew disembark If verminous conditions are found, the authority have adequate powers for dealing with them I propose to send to local authorities suggestions for the coördination of their resources for dealing with parasitic conditions with special reference to the powers given to them under the Scabies Order, 1940 —Sir F FREMANTLE What about entrants from Ireland ?—Mr BROWN If there was any sign of typhus in Ireland, the same thing would apply, but there is no sign of it —Sir P HURD If there is no evidence of typhus in Ireland, there is evidence of other conditions likely to produce typhus here unless they are dealt with.—Mr BROWN That is another issue altogether, and I would not accept that generalisation

Medical Inspection of Irish Labourers

Sir P HURD asked the minister whether the medical and sanitary measures which the Wiltshire local authorities had had to take because of the condition of Irish labourers imported into Wiltshire by Government contractors were proving adequate to safeguard the community generally from infection —Mr BROWN replied The specific measures as regards the workers are being taken by the contractors, under the supervision of my regional medical officers, with the result that the public health services of the local authorities have not been called upon to any appreciable extent Some thousands of men have recently been inspected and the cleansing arrangements are being extended —Sir P HURD Do I understand the minister to say that the present conditions of inspection are satisfactory ?—Mr BROWN I never use the word "satisfactory" I have already pointed out that the contractors themselves are making extended arrangements

Juvenile Hours of Work

Mr E. BEVIN, replying to Mr KENNETH LINDSAY, said that he had no specific evidence to show that long hours of labour were prejudicing young workers from securing vocational and technical training in their various crafts By arrangement with him the President of the Board of Education and the Secretary of State for Scotland had asked the local education authorities to send to the local factory inspectors, or to employment exchanges, particulars of excessive hours worked by boys or girls which came to their notice in the course of the follow up of registration He anticipated that serious cases of inability to attend training courses would be brought to light

Medical Personnel in the Ministries

The Home Secretary informed Sir E GRAHAM LITTLE that eight medical practitioners are at present employed in the Home Office and seven in the Ministry of Home Security Of these only one in the Home Office and three in the Ministry of Home Security are men under 51 years of age The Central Medical War Committee have granted deferment until September, 1942, for the Home Office official Two of the Ministry of Home Security officers are leaving the department at the end of the month and the remaining officer will be replaced by an older man as soon as a suitable substitute can be found.

The Minister of Pensions stated that his department employs 196 whole time medical officers They are assisted in a part time capacity by some 750 medical practitioners who are in the main engaged in civil practice

The President of the Board of Education said that his department employed nine full time registered medical practitioners of whom one was temporarily seconded to the Ministry of Pensions It would be impracticable to employ civilian medical practitioners to inspect and supervise the work of school medical officers employed by local authorities

Alien Doctors

Mr BROWN informed Sir E GRAHAM LITTLE that of 1032 alien medical practitioners in this country available for employment, other than those on the permanent medical register, 735 have obtained civilian medical employment or commissions in the medical branches of H M Forces

Examinations for Venereal Diseases

Sir E GRAHAM LITTLE asked the minister whether, in view of the rise in the incidence of venereal diseases and the danger of dissemination of these diseases in the armed services from sources outside the control of commanding officers, a recent instance of which had been furnished to him, he would grant powers to medical officers of health to have persons of both sexes, who were suspected as being sources of infection, examined and, if necessary, treated —Mr BROWN replied I am considering what action can most appropriately be taken to deal with the problem

Publication of the Silicosis Report

As a result of war conditions there has been some unexpected delay in the final stages of the publication of the report on the investigation into the problem of silicosis among coalminers Copies should, however, be available for issue by May 16 (Sir JOHN ANDERSON replying to Mr JAMES GRIFFITHS)

Compensation to Injured Workers

Sir CHARLES EDWARDS asked the Home Secretary if he would consider the urgent need of raising the amount of compensation payable to injured workpeople, whether he was aware that, prior to the Supplementary Allowance Act, 1940, which raised the amount by 5*s* per week, with 4*s* each for the first two children and 3*s* each for others, the amount of compensation payable was only 50% of wages earned, with a maximum of 30*s* per week, that, since the war, wages had been considerably raised, whilst it was estimated that the average increase in compensation payments was about 10*s* per week, or less than half of the wages increase, so that the position of injured persons was progressively worsened, and would he take steps to remedy this —Mr OSBERT PEAKE replied The Workmen's Compensation (Supplementary Allowances) Act was a temporary measure to provide increased benefits pending a review of the whole system It gave substantial increases, particularly to the man with a family, and there would be obvious difficulties in any further substantial revision of benefits pending the report of the comprehensive survey of all existing schemes of social insurance which is being undertaken under the direction of the Paymaster General

Reports to Employers

Mr C T CULVERWELL asked the Minister of Health whether there was any obligation on the part of an insurance doctor to furnish medical reports to a patient's employer in compensation cases Mr BROWN replied No

Sale of Pre-packed Drugs

Mr R DE LA BERE asked the Minister of Health if he could furnish an estimate of the proportion of pre packed drugs which were sold to the public other than through registered pharmacists —Mr BROWN replied I have no information on which to base an official estimate, but I understand that the proportion is in some quarters estimated at 20–25%

Consumption of Bread

There is no evidence that there has been any general decline in bread consumption since the change over from white bread to national bread But it is too soon to determine whether any change in consumption over a long period may be expected (Major G LLOYD GEORGE replying to Mr R DUCKWORTH)

National Flour

Commander O S LOCKER LAMPSON asked what proportion of vitamins contained in the whole grain of wheat is left out in the new loaf produced by the Government, and whether it will be gradually brought up to the content and maximum extraction reached in the last war ?—Major LLOYD GEORGE replied Approximately a fifth of the vitamins in the wheat grain is left out in the milling of national wheatmeal It is impossible to compare national wheatmeal with the high-extraction flours of the last war, because the latter were not prepared according to a precise specification and they were often diluted with other cereals

Diseases of Dairy Cattle

Captain PETER MACDONALD asked the Minister of Agriculture whether he could give any approximate estimate of the present annual loss involved through diseases of dairy cattle, and whether, in view of the importance of this matter, arrangements could be made for a national system of regular veterinary inspection of these herds —Mr R HUDSON It has been estimated that diseases of dairy cattle involve an annual loss of not less than 50,000,000 gallons of milk, as well as of appreciable quantities of meat I hope to introduce at an early date a voluntary scheme for the control of dairy cattle diseases, an important feature of which will be the regular veterinary examination of dairy cows by the practitioner —Captain MACDONALD Why should the scheme be voluntary —No further reply was given

---

Obituary

WILLIAM ALBERT ROBERTSON

CBE, MC, MD EDIN, COLONEL AMS (TA)

Colonel William Robertson died on March 26 as a prisoner of war at Stammlager VIII B Up to a few weeks ago he had been at Rouen awaiting repatriation and his removal to a camp in Eastern Germany was a heavy disappointment to his friends He was born in 1885, the son of John Robertson, linen manufacturer of Dundee and Mexico, and was educated at Dundee High School, University College, Dundee, and the University of Edinburgh, where he graduated in 1907 He set up in practice at Hartlepool, but when war broke out in 1914 he joined up at once and was appointed medical officer to the Durham Royal Garrison Artillery In 1915 he went to France with the Northumbrian division where he served till 1918 He was mentioned in dispatches and awarded the M C for the resource he showed in operations at St Aubin, when his gallantry was an example to all the men under his command In 1919 he returned to Broughty Ferry, and of his busy life there R M P writes Willie Robertson's patients were also his friends, and he grudged them no service No matter the hour he was always ready to go to their help He also took an active part in medical gatherings of the district where his large and cheerful personality endeared him to all He had played rugby for the University first XV at Edinburgh and later for the Hartlepool Rovers, while in 1910 he was one of a British team which toured South Africa When he gave up these games he found vent for his copious energy in tennis, golf and swimming For many years he was an enthusiastic member of the Amphibious Ancients who swam each morning in the Tay ay Brot'y Castle all the year round In a golf match Willie was a helpful partner and a dour opponent He inaugurated the sociable annual game of golf at the Forfarshire Medical Association meetings for which he presented a silver cup where his name is inscribed as the first holder

Robertson also found time to give his services as medical officer to the Dundee convalescent home, the Armistead home for children and to other institutions for ex-service men and their dependants He was always a keen territorial and from 1928–32 he was in command of the 162nd Highland Field Ambulance He was created CBE in 1939 for his work as ADMS of the 51st Highland division to which he had been appointed in 1936, and he went to France in this capacity in January, 1940 Later he commanded a general hospital, and was reported missing in June but news came later that he had been taken prisoner at Boulogne in May

Dr Robertson married in 1918 Elspeth Jessie Lindsay, and they had two sons The elder is a lieutenant in the Seaforths, and the younger is in the RAF

SOMA WEISS

M D CORNELL, F A C P

NEWS has only lately reached this country of the death in Boston on Jan 31 after a subarachnoid hæmorrhage of Dr Soma Weiss, Hersey professor of medicine at Harvard Colleagues, students and patients loved and respected him, and to him must go a large share of the credit for Harvard's high standing among medical schools

Weiss was born at Bestercze in Hungary in 1899 When he came to America in 1920 he had already proved his quality as a research fellow in physiology and biochemistry at Budapest, and his interest in these subjects persisted Soon after he reached America he graduated in arts from Columbia University, New York, and in 1923 he qualified with high honours from Cornell medical school His early postgraduate work was largely concerned with pharmacological research, but when in 1925 the Harvard medical school drew him to Boston with the offer of a research fellowship in medicine at the Thorndike Memorial laboratory he was able to direct his unlimited energy to clinical investigation, particularly of problems concerned with the heart and circulation. He became associate professor of medicine in the medical school, director of the Harvard teaching services in the Boston City Hospital and assistant director of the laboratory In 1939, eleven years after he came to Boston, Weiss succeeded Henry Christian in the Hersey chair, and as physician-in-chief at the Peter Bent Brigham hospital

In his research work Weiss made many notable contributions to medical knowledge and had some two hundred publications to his name, including papers on the hæmodynamics of circulatory failure, left ventricular failure, the beriberi heart, chronic pyelonephritis as a cause of hypertension, and the toxæmias of pregnancy As an investigator he applied physiological methods to the elucidation of clinical problems, using the human subject for observation and experiment, but as a physician he never forgot "that the patient in hospital might be, like anyone else, homesick or lonely, ill in mind as well as body" The number of pupils who went from his laboratory to positions of responsibility bear witness to the value of his training He could draw on his enormous knowledge of medical literature at will and his weekly discussion with the house-officers of the whole hospital were exciting and full of ideas He spoke many languages and in heated moments when an English word failed him he had no hesitation in using a German, Hungarian, Slovak or French one in its place Weiss served on many committees and his advice was often sought by the federal government He leaves his wife with two young sons

A Scottish colleague who worked for a time at Harvard writes Perhaps the most striking thing about Soma Weiss was his almost maniacal energy He worked harder than any man I have known, and worked continuously He gave much time and thought to the organisation of teaching of medical students, preparing his material for lectures, demonstrations and ward rounds with care and thoroughness, devising new schemes to attract students to his wards—though they needed little enticing His friends will find it impossible to imagine Boston without Soma

CHARLES LEON COHEN

M D BRUSSELS

THE sudden death in London on April 18 of Dr Charles Cohen in his 61st year has deprived the Belgian Red Cross of an able collaborator He was born in Brussels and took his medical degree there in 1903 Shortly after, inspired by a lecture given by Jules Bordet on infectious diseases, he became Bordet's collaborator for twenty years at the Pasteur Institute where he was in charge of the preparation of vaccines, and his name became associated with *meningite septicemique* But he did not give up his clinical work, especially among children, and in 1936 he accepted the university chair of pædiatrics He published studies of pulmonary gangrene, pseudoleukæmia, rickets, infantile syphilis and *la granulie froide*, while he investigated diphtheria carriers among children and the indications for therapeutic blood-transfusion in infants In the early months of the war he was working with the Belgian Red Cross in France, and in November, 1940, he accompanied his wife and daughters to the United States Last October he was summoned to London to take charge of the Red Cross medical department there His son has joined the RAF

Lieut-Colonel COLIN CHARLES GORDON GIBSON, R A M C, died on active service during April Born in 1892 he qualified in 1915 from Guy's and immediately joined the RAMC He served in France till he was taken prisoner in March, 1918 He was repatriated soon after the armistice and relinquished his temporary commission soon afterwards But a year later, in 1920, he took a regular commission and in 1928 he was promoted major

Medical News

University of Cambridge

On May 1 the degree of M D was conferred by proxy on K. O Black, and the degrees of M B , B Chir on W S Rhodes

University of London

Sir Girling Ball and Dr A M H Gray have been reappointed to the senate by the faculty of medicine, and Dr H. E. A. Boldero by the general medical schools Major-General P H. Mitchiner, F R C S , will continue to represent medicine at convocation for another year

Royal College of Surgeons of England

On Mondays, Tuesdays and Fridays, May 11–22, Dr A. J E Cave will give a series of museum lecture demonstrations to medical practitioners and advanced students The lectures will be held in the college, Lincoln's Inn Fields, at 4 P.M. each day

Royal College of Physicians of London

At a meeting of the college, held on April 30, with Sir Charles Wilson, the president, in the chair, Dr H E A Boldero was elected registrar and Dr J D Rolleston a representative on the committee of management of the Chelsea Physic Garden The following were elected to the fellowship —

Sir John Stopford M D Manc (Manchester), T Percy C Kirkpatrick, M D Dubl (Dublin), R I Lee, M D Harvard (Boston, Mass.), Ernest Jones, M D Lond (London), J W. Trevan, M.B Lond (London); C, D S Agassiz, M D Aberd (London), L Cunningham, M.B Camb (Liverpool), S W Davidson, M D Durh (Newcastle-on Tyne), D G Leys, D M Oxfd (Inverness), F H K. Green, M D Lond (London) E B Jones, M.B Adelaide (Adelaide), B C Tate, M D Camb (Birmingham), H H Hyland, M B Toronto (Toronto), J W Brown, M.D Lond (Grimsby) W G Oakley, M D Camb (London), A W Franklin, M B Camb (London), F Forman, M D Aberd (Cape Town), J B Kirk M B Edin (Accra), G O Lambert, M.D Camb (Reading), J B Harman, M D Camb (London), R A Willis M D Melb (Prahran, Victoria), R R Bomford, D M. Oxfd (London), J H Palmer, M D McGill (Montreal), Group-Captain H W Corner, M D Aberd (R A F), W D Newcomb, M D Camb (London), G P Wright, D.M Oxfd (London), R. M Stewart, M D Edin (Watford), E H R. Harries, M.D Lond (London), T L Apperly D M Oxfd (Richmond, U S.A), R V Christie, M D Edin (London), and S C Shanks, M D Glasg (London)

The following, having satisfied the censors' board, were admitted to the membership —

R. I S Bayliss, M B Camb K. W Cross, M B Lond , E L Frankel M.B Lond A C C Hughes, M B Camb , surgeon-lieutenant, R N V R , Arthur Jordan, M B Lond , C W Kesson M B Lond., A B Kinnier Wilson, M B Camb R M Miller, M B Camb , flying-officer, R.A F V R , W L L Rees, M B Wales, Neville Southwell, M.B Camb , and Matthew Steel, M B Lond

Licences to practise were conferred upon the following 261 candidates (231 men and 30 women) who have passed the final examination of the conjoint board —

J W Abbiss, R J Alcock, B C E Aldous, Gwladys V Aldridge, M S Aldridge, J G U O Alexander A R Allardice, R M Archer, D L Arnold, A E M Ash Wiggins Robert Aspinwall J N Aston Geoffrey Auckland John Ball, J R Ballantyne, J C Ballantyne, G F Barnes A E Barrett, Denis Bartlett Anita M Beck, G A Bedwell, Eileen L Bell N E Bennett, J F R Bentley A M I E Bey A. W Blackwell, D H Bone, R D Brawn, Angela J Brayn B F Brearley, R S E Brewerton J G Brockis, V R Bruce, P J Bryce-Curtis H A Buck, E W C Buckell, I W Buirski, H W Bunn, D L C Burden, L E Burkeman Joyce M Burt, Sheila M Burt, L J H Burton P J C Burton, N R Carlson D J Carter, J R Carter R D Chalmers W R H W Chambré, Noel Clarey G B Cliff, H V Cockburn, F J Cockersole, Audrey Coghlan, Jessie Collinson N D Compston F K. Crittenden, H V Cross R. E Danckwerts C M Dave, D C Davidson, J A L Davies B T Davis, Audrey E R De Silva, D B Doran, J W L Doust G W Downes, A W N Druitt R A H Dubery, P W Edward Herbert Edwards, Mary E Egerton, Mary R Ellis, F G Elvins D W Evans, P R C Evans W F Felton, Marie Fischer Ascher J D Fisher J L Fison, J A S Forman, T B Forrest, Roy Franey, Imrich Friedmann, J C Fulford, K C Fulton J T Furnival F R. Gaballa M. F Gallop, C S E Gifford, C E J Glaisher, H J Glanville, Gerald Gremson, E J Grierson, R. M. Griffiths Nicholas Hajdu, R L Hall, Rhodes Hambridge, H J Harris, Mary M Harrop, A H Haysom, Winifred M Heaton, H N Heffernan, W L P Hewerdine R H Heyland A B Hill I M Hill, R H S Hirst, E O Höhn G R Holtby, P W Hopper, M S Howe R M Howson R B Hughes, R V Imundi, K N, Inman, J A Irwin, D G Ismay, D K Jacobs, A R James, Christine J T Jamieson Hanus Jelinek, B A. G Jenkins, C F Jobson P G S Johnson I T B Johnston D L H Jones E O W Jones, G M Jones Richard Keen A W Kelly J E Kerton, L G Kiloh Richard King Brown Martha Klein Dynski C R Knappett, K. D Kumria, Ernest Lasserson J M Ledingham, R G M Ledingham C A Leeson K. T Lockhart, J D Loughborough, Alan Lyell J C McDonald, E V Mackay, I E D McLean Vera J McMullen S J R Macoun A D McShine Emanuel Mandler I A Marriott Joan Martin R. H Martin R G Mathers J F Mawe M J May, Christine M Millar, A R Mills F A Milne, B B Milstein, J P. Mitchell M J Mitchell E K Morris Isaiah Morris M F Moses. I R Moyle Margit Muller, C F J Muller, Joan V Muller Rowland, Barbara C Mulvany, J M Munden, J H F Mundie, J B Musgrove, D H Nelson, M P Nelson, P G L Parry, Joy E Patrick, C E R Payne, D J H Payne, Asher Pearlman, J R. B Peckover, E O Pedersen Hedayatollah Pezeshgi, C M Phillips, H G Phillips, F C R Picton, Joan M Platts, H P Player, A O Porteous, Phyllis Poyner Wall, T C Prideaux, J N A. Pritchard, Harold Riley, T R Riley G A Robinson, R H M Robinson, Millicent M Rogerson, D I Rowlands, C M Ruben, R H Russell G T Rutherfoord, F W E Rutter, D L Sandes, Max Schiller, Francis Schmelz, T L Schofield, D L Scott, Eric Seal, M R Shirazi, Eleanor L Skelsey, G A Smith, R G Spicer, V G Springett, Paul Steiner, J W Stephens, David Stern, D I Stirk, M G P Stoker, P B Stones Peter Story, Peter Stradling, W S Suffern C B M Swan, Joan Sykes, G W. Taylor, L G Taylor, Margaret V Teichmann, D C Thomas, G E Thomas, F F Tietze, W P Traub, P R. Travers, Joseph Ungar, W J U Tin, J K Wagstaff, A H O Walker, K W W H Walton, J F N C Ward-McQuaid, H B S Warren, D C Watson, F. G H Watson, C H Watts, K T Weavers, M H West Roger West, Eleanor A White, K P Whitehead, Nora F M Wilkinson, D W Wilks, A H Williams, Evan Williams, H O Williams, R I Williams, G M Williamson, G F Willson, W D Wilson Max Winternitz, T R Wooldridge, W E Yeates, and A. W O Young

Diplomas in child health were granted to the candidates named in the report of a meeting of the Royal College of Surgeons in our issue of April 18 (p 491)

Royal Society of Medicine

The section of obstetrics and gynæcology will meet on Friday, May 15, at 5 P M , when Mr Eardley Holland, Dame Louise McIlroy and Mr Arnold Walker will open a discussion on maternity services On May 16, at 3 P M , the section of physical medicine will hold a joint meeting at the Royal Victoria Hospital, Netley, with the Medical Society for the Study of Venereal Diseases, when there will be a discussion on gonococcal arthritis and "rheumatism" The opening speakers will be Major G D Kersley and Lieut -Colonel Ambrose King

Licence for Industrial Alcohol

The Minister of Supply has made an order reducing the minimum quantity of industrial alcohol (other than mineralised methylated spirit) above which dealings are subject to licensing Licences will now be necessary for quantities exceeding one gallon in any period of a calendar month. Applications for licences should be addressed to the Molasses and Industrial Alcohol Control, Great Burgh, Epsom, Surrey

Emergency Grant to London Hospitals

Between August, 1939 and July, 1941, the Hospital Saving Association put £200,000 into a war emergency reserve fund on the understanding that the money would later be distributed in consultation with the voluntary hospitals To relieve the immediate necessities of these hospitals it has now been decided to release £100,000 at once In the last year of peace the Association paid the hospitals £700,000 In 1941 the figure was £556,000 This extra £100,000 will now be shared among them on the basis of the mean of the amount which they received in those two years

Tavistock Clinic

In the year of its majority—it came of age on Sept 27, 1941—the clinic has had to face loss of equipment and damage to property by bombing, but at its war time home at Westfield College its work has gone on without a break. Though many more of its staff have been called away to war work those who remain dealt with 750 new patients and in all over 12,000 attendances were recorded There was an especially encouraging growth of work in the children's department where the total of new patients was the highest for six years The clinic has also continued its branch activities at Maidenhead, Reading, and Watford.

Hostel Camps

The last of Clydeside's four hostel camps to accommodate war workers who may lose their homes through air attack was opened on May 2 by Colonel John Colville At these camps alternative homes complete to the last blanket are ready and waiting for 2000 workers, who will be able to continue their essential war duties if their own dwellings are blitzed As the workers are transferred to the hostel camps their families will be evacuated to safer areas in the country Each camp has dormitories, recreation rooms, dining-hall, sick bay, kitchen, staff and warden's quarters They have been built by the Scottish Special Housing Association for the Department of Health for Scotland

---

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export

Postgraduate Lectures in Dermatology

The London School of Dermatology, at St John's Hospital for Diseases of the Skin, Lisle Street, Leicester Square, W C 2, will hold a short course of lectures beginning in the third week in May, on Wednesdays at 4 30 P M The lectures will be on practical subjects and specially directed to be of help to medical officers of H M Forces There will be no fee

Milk Priorities for Babies

The Ministry of Food has made arrangements to provide condensed milk where necessary for premature babies A special permit for this milk is now available on presentation of a medical certificate stating that the infant is premature and under six months, that condensed milk is essential and the quantity needed each week Medical practitioners may obtain the printed form of medical certificate for this purpose from the local Food Office The certificate is only valid for four weeks The permit does not guarantee supplies, it is only an authority to spend additional points on this food if supplies are available, and babies receiving this condensed milk will only be entitled to one pint priority liquid milk daily

Arrangements have also been made under the Milk Supply Scheme for all other infants under one year to be entitled to a priority supply of liquid milk up to two pints daily This priority has been available only for bottle fed infants in the past, and the extension to all infants is to safeguard the need of the nursing mother

British Dental Students Association

Students representing all but two of the dental schools in the United Kingdom met in the Manchester Dental Hospital during the Easter recess under the chairmanship of Dr F. C Wilkinson, director of the hospital and professor of dental surgery in the university, who surveyed the "man-power position" as it affected the dental profession (see *Lancet*, April 11, p 449) The association aims at promoting the educational and social interests of dental students, and improving the dental services Membership is open to any member of a dental students society (constituent body) in the United Kingdom, graduates and licentiates in dental surgery may become associate members The governing body will consist of one representative to each 100 members of a constituent body, to facilitate meetings this council has been divided into three regions—a Northern, Midland, and Southern The Joint Planning Committee of Dental Students (see *Lancet*, Oct 11, 1941, p. 430) has been invited to become the planning committee of the association A second conference is being arranged for September at Leeds Particulars from the secretary, Mr F E Hopper, Sutherland Dental School, Newcastle on-Tyne

ECONOMY IN QUININE —In a letter last week by Nicol and Shute (p 546) the sentence six lines from end should read "not *until* the diagnosis has been confirmed by blood examination "

Public Health

Skin Diseases of School-children

THE school medical officers in their reports for 1940 and 1941 record almost without exception an increase in scabies, a well-marked decline in impetigo, a further reduction of head ringworm, in most districts to zero, and a decrease in body ringworm In a series of 16 reports from counties and boroughs there is no mention of body lice and there are considerable variations in the percentage of children returned as having lousy heads The increase in scabies is serious In Stockport the number detected was 153 in 1940 and 346 in 1941, in Barnsley 337 were treated in 1939 and 423 in 1940, in Leeds 1561 children were excluded from school for scabies in 1941 In the counties the increase was less obvious Several school medical officers comment on the hopeless task of clearing the school-children of scabies while the remainder of the families are left to reinfect them. The position of impetigo is different, for adults are comparatively rarely attacked, so the work of the school doctors is fruitful Impetigo has been declining for several years and in 1940–41 had sunk by at least 50% Formerly the ratio of impetigo to scabies was over ten to one, but at present scabies is actually the more frequent disease Ringworm of the head (microsporon) is quickly following favus into extinction Microsporon ringworm is confined to children, so it was a reasonable expectation that the school and child-welfare services would exterminate it, and they have nearly succeeded in doing so The large-spored ringworm (trichophyton), which affects the body as well as the scalp and is not limited to children, was formerly less than a tenth as common as the small spored in school-children, but today, though actually much less often seen than it was, is relatively five times as frequent Body lice have never been common in school-children, even in those of dirty families, and are now rarely seen The probable explanation is that school-teachers insist on a reasonable degree of cleanliness of children attending school—this is required by the Education Acts—so children get more regular change of underclothes than dirty adults A change of underwear once a fortnight is of itself almost sufficient to defeat the body louse, which lays its eggs in the seams of clothing The head louse, which lays its eggs only on the hairs, can be defeated only by personal cleanliness

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED APRIL 25

Notifications —The following cases of infectious disease were notified during the week smallpox, 0, scarlet fever, 1031, whooping-cough, 1672, diphtheria, 750 paratyphoid, 18, typhoid, 8, measles (excluding rubella), 3502, pneumonia (primary or influenzal), 951, puerperal pyrexia, 186, cerebrospinal fever, 170, polio myelitis, 2, encephalitis lethargica, 3, polio encephalitis, 4, dysentery, 185, ophthalmia-neonatorum, 83 No case of cholera, plague or typhus fever was notified during the week

Deaths —*In 126 great towns there were no deaths from* scarlet fever, 1 (0) from an enteric fever, 2 (0) from measles, 15 (6) from whooping-cough, 25 (0) from diphtheria, 35 (3) from diarrhœa and enteritis under 2 years, and 20 (1) from influenza The figures in parentheses are those for London itself

Bristol reported the fatal case of enteric fever There were 5 deaths from diphtheria at Plymouth

The number of stillbirths notified during the week was 258 (corresponding to a rate of 41 per thousand total births), including 33 in London

Appointments

ABRAHAMSON, JULIUS, M D BRATISLAVA R S O at the London Jewish Hospital

GILLIES, J S, M B GLASG examining factory surgeon for Canterbury, Kent.

HALL, J A M, M D GLASG examining factory surgeon for Shotts, Lanarkshire

Births, Marriages and Deaths

BIRTHS

ARNOTT —On May 1, at Woking, the wife of Flying Officer James Arnott, M B, Middle East Forces—a daughter

BOWES —On April 23, at Ripon, the wife of Captain R W Wallace Bowes, R A M C —a daughter

JAMES —On April 28, at Ellon, Aberdeenshire, the wife of Surgeon Lieut Commander Eric James, R N —a son

PLUNKETT —On April 25, at Moretonhampstead, Devon, the wife of Captain O R L L Plunkett, R A M C —a daughter

ROB —On April 30, at Woking, the wife of Lieutenant C G Rob, F R C S, R A M C —a son

STERN —On April 26, at Twickenham, the wife of Mr David Stern, F R C S —a son

WINTER —On May 1, at Cambridge, the wife of Captain W M Winter, R A M C —a son

MARRIAGES

ABELSON—MACNAUGHTON-JONES —On April 25, at Brundall Cecil Edward Abelson, instructor commander, R N, to Moyra Isobel Macnaughton Jones, M D, R A F (Medical Services)

BOYLE—TALLACK —On May 2, at Chislehurst, Archibald Cobbourn Boyle, lieutenant, R A M C, to Patricia Evelyn Tallack

FORSTER—BAXTER —On April 30, at Oxford, Walter Melville Forster, major, R A M C, of Burford, to Joan Alice Baxter

HURLL—NEWTON —On May 1, at York, John Bain Hurll, captain R A M C, to Noreen McKenzie Newton, flight officer, W A A F

DEATHS

COLLEDGE —On April 17, in Paddington Lesley Robert Colledge, F R C S E, major R A M C retd ; aged 83

FURNIVAL —On April 22, at Auburn, Sydney, N S W, Francis Henry Furnival M R C S

LAWSON —On April 28, at Hove, Frank Howard Lawson, M R C S, aged 69 years

POOLEY —On May 2, John Sandys Pooley, M A CAMB, M R C S D P H, of Rochdale, aged 52

WHITEHEAD —On April 29, at Leicester, Eugene Christopher Whitehead, M D LOND, major, R A M C retd

THE HAZARDS OF TRANSFUSION*

L E H WHITBY, CVO MC, MD CAMB, FRCP,
BRIGADIER A M S

ASSISTANT PATHOLOGIST TO THE MIDDLESEX HOSPITAL,
CONSULTING PHYSICIAN IN BLOOD TRANSFUSION
AND RESUSCITATION TO THE ARMY

IN theory, blood-transfusion should be a perfect tissue graft—a physiological procedure which, provided safeguards are taken, should be unaccompanied by reaction, distress, discomfort or complication of any kind Yet, in practice, reactions are common , some maintain that nearly all transfusions of fresh blood are associated with a rise of temperature even though this may be symptomless[16, 32] , others believe that about 50% of fresh blood-transfusions are associated with a rise of temperature or a rigor, the incidence of the latter being about 8%[13] In attempting to review the hazards, I cannot help first casting my mind back over twenty years to student days when blood-transfusion was practised with whole fresh blood obtained in Kimpton's paraffin-lined tube The success of this type of transfusion was remarkable , the volume rarely exceeded a pint, the rate was that at which the blood would flow in, and when cleanly administered by an expert the apparent reaction rate was negligible Nowadays we have come to rely on citrated blood which presents no technical difficulties, which can be stored for long periods, which has widened the scope of transfusion as a therapeutic measure and can be administered in large amounts at varying rates, but which has brought with its advantages a number of additional hazards The physician must sometimes regret the passing of the older and more difficult technique for selected cases, despite its disadvantage of vein dissection, when his patient requires to have added to the circulation something more than mere volume or mere red corpuscles Whole blood is the nearest approach to a perfect tissue graft

The hazards which have to be faced with blood-transfusion are (1) the systemic non-specific pyrexial type of reaction due mainly to the apparatus and crystalloid fluids used in transfusion work , (2) circulatory and vascular disasters due to the general condition of the recipient , (3) intravascular hæmolysis of the transfused blood , and (4) disease transmitted from the donor

Systemic Reactions

Reliable statistics concerning reactions of this type are difficult to obtain mainly because there is no uniformity of opinion as to what constitutes a reaction, which itself varies with the person who carries out the transfusion, with the method employed, with the rate of administration and the condition of the patient Too fast a rate can cause a rigor which ceases instantly if the rate be slowed[27] This should be borne in mind when treating casualties many of whom should theoretically receive a large amount rapidly

Febrile reactions have been placed in three grades[32] those associated with a rise of temperature to 100° F but no other objective features, those with a similar or greater rise of temperature associated with a feeling of cold but no actual rigor, and those associated with a definite rigor The adoption of this classification would do much to enable a proper assessment to be made of the incidence and severity of non-specific reactions following the use of the various transfusion fluids Most authorities[3, 8, 11] are agreed that with stored blood cleanly taken and of reasonable age—that is, not exceeding 14 days—the non specific reaction-rate is no greater than with fresh citrated blood Simple pyrexial reactions are most commonly due to foreign protein, dead bacteria, disintegrated or intact, and living but non-pathogenic bacteria , all of these may be found in improperly prepared or stale distilled water, improperly prepared solutions and dirty apparatus The body will not tolerate the introduction into the circulation of more than a limited amount of foreign protein, and it is estimated[15] that solutions with an albuminoid ammonia content of 0 005–0 025 part per 1000 always give rise to pyrexial reactions "Saline fever" was tracked down to distilled water when the first intravenous arsenicals were being used,[23] and to this day stale distilled water is one of the chief causes of febrile reactions , good fresh tap water has less bacteria than old distilled water The prime requirements are scrupulous cleanliness of apparatus, fresh distilled water from a still fitted with proper baffle plates to prevent carrying over of foreign material, and the immediate autoclaving of all solutions in their final containers[41] Neglect of this last precaution is a frequent cause of pyrexial reactions because the at first insignificant aerial contamination of the contents has time to multiply with the passing of time How much can be done to reduce these non-specific reactions can be seen[22] from two comparable series of some hundreds of transfusions in which the incidence was reduced from 12% to 1 2% merely by following a scrupulous cleansing technique and using fresh distilled water

Most of these hazards are therefore avoidable and a high incidence of reactions of this type reflects greatly on the efficiency of those whose job it is to prepare apparatus and solutions Such reactions, rarely fatal, may occasionally be the last straw in an enfeebled patient, and must often diminish the benefit of the transfusion Most of those with experience of blood depots would now admit that their contamination-rate is fairly high , the degree of contamination is small and the pathogenicity of most of the organisms is negligible If the blood is administered fresh no reaction follows, nor does it if the blood is immediately cooled and the few bacteria are promptly subjected to the restraining action of the refrigerator But if such blood is not promptly cooled or if it is removed from the refrigerator and allowed to warm up for any length of time a pyrexial reaction is to be expected Common sense is necessary in the handling of stored blood in order to avoid these avoidable hazards It should be appreciated that the more violent of the non-specific reactions may clinically resemble the serious reactions caused by over-age blood and incompatible blood , a helpful differentiating feature is the intense lumbar pain which is so characteristic of true intravascular hæmolysis

Circulatory

When relatively large amounts of fluid are introduced into the circulation its fate depends on its nature Thus, crystalloid solutions rapidly reach the tissues and may cause pulmonary œdema , they leave the circulation even though blood-volume is reduced The proper use for crystalloid solutions is to overcome tissue dehydration and not for the fleeting restoration of blood-volume But water bound to protein, as in blood plasma or serum, is retained in the circulation if blood-volume is reduced , nor if it is excreted does it appear to traverse the same path as crystalloid-bound water Transfusions under war conditions are often massive, involving 5, 6 or 7 pints of blood or blood substitute[14] What is the danger then of overloading a circulation ? Analysis of transfusion fatalities in peace-time shows that 4 out of 6 died of pulmonary œdema in one series,[31] and 2 out of 7 in another[7] But all these deaths occurred in anæmic patients with an enfeebled cardiac muscle, and at a time when the importance of volume and rate of administration had not been fully appreciated In time of war the usual casualty may be presumed to have had a normal cardiac muscle before being wounded and from an experience of some 150 transfusions in casualties I have yet to see a case of pulmonary œdema from necessary massive transfusion[1] , some indeed have developed remote inflammatory lung complications but no-one could say with conviction that the anæsthetic had played no part in producing these This opinion is confirmed by recent experimental work[34] on 13 normal human subjects—that is, subjects with a normal blood-volume These have received from 700 to 2100 c cm of serum intravenously in 7–20 minutes, one as much as 2 litres in 16 minutes, with no more than a trifling embarrassment and certainly no pulmonary œdema I am sure that in casualty work failure to restore blood-volume is a danger greater than overloading of the circulation.

But with an enfeebled cardiac muscle the problem is entirely different. For such cases excellent principles have been laid down[25] as to volume and rate, on the basis of a large experience It has been concluded that the rate should never exceed 1 c cm per lb of body-weight per hour in the average case, while in those whose initial hæmoglobin is below 25%, with cachexia, with cardiac disorders or respiratory embarrassment the rate should be reduced to 0 5 c cm , in these too, restoration of hæmoglobin to a normal level should be achieved by transfusion at intervals rather than at one session These rates should not be exceeded even for short periods If these principles are adhered to the circulation has time to adapt itself to the increased blood-volume and to extrude the unwanted plasma The danger of overloading in the course of a massive transfusion to these chancy subjects with feeble cardiac muscle has been greatly reduced by the use of concentrated red-cell suspension transfusions which call for no effort to eliminate the unwanted plasma [24 48] Vascular accidents such as retinal hæmorrhage are not uncommon with nephritis or with the blood dyscrasias [7]

---

* Harveian lecture delivered to the Harveian Society of London on May 4, 1942

Intravascular Hæmolysis

Compatibility provides a fascinating study The hazard to be faced, with gross incompatibility, is agglutination and lysis of the cells leading sometimes to immediate death or more often to death in the course of a few days, but a fatal issue is by no means inevitable even when large amounts are transfused The symptoms of such a disaster include violent pain in the back, rigor, respiratory embarrassment, circulatory collapse, hæmoglobinuria, hæmalbuminæmia, jaundice, urticaria and symptoms due to small hæmorrhages or emboli in the brain, mesentery, endocardium and gastro-intestinal mucosa , the terminal stages of those who survive the immediate so-called " hæmolytic shock " are characterised by renal failure A number of studies [28 46] have been made on surviving cases which throw light on the mechanism of much rarer but nevertheless similar reactions due to factors additional to the Landsteiner groups, and especially on the extra risks which are run by pregnant women and by those who have to receive multiple transfusions

LANDSTEINER GROUPS

The transfusion of incompatible corpuscles introduces into the circulation an antigenic foreign protein The result is the classical antigen-antibody reaction The contributed agglutinogen first absorbs the circulating agglutinin so that in the early phases the offending agglutinin may not be detectable in samples of the recipient's serum [28] Thus, A corpuscles given to an O recipient may temporarily remove all the α agglutinin which the latter should possess This is a trap which should be borne in mind by those called on to investigate such a disaster But the remote effect, should the recipient survive the first insult, is stimulation of the agglutinin to a very high level There must be quite a number with weak agglutinins who have survived an incompatible transfusion with mild, unnoticed or disregarded symptoms But woe betide them if they be later transfused from the same, apparently compatible, donor

Landsteiner group compatibility—the A, B, O factors —depends for safety entirely on properly performed grouping tests, the correct procedure for which has been fully described [36] The menace of a blood-grouping test wrongly performed can be appreciated from an analysis of 7 transfusion fatalities of which 2 were due to group A wrongly determined as O [7] , 4 out of 6 in another series were also due to wrong grouping [6] In these days of mass grouping and large blood banks of group O blood, errors not only technical but also clerical have to be carefully guarded against No-one nowadays would send out blood guaranteed to be a certain group without a careful recheck of both cells and serum The greatest danger is the use of impotent serum or of serum not sufficiently potent to detect with ease the insensitive A_2 factor in the subgroups A_2, and especially A_2B, so that these groups are mislabelled O and B respectively with disastrous results when used as donors Infected serum, which has panagglutinating properties or infected corpuscle suspensions, may lead to the wrong determination of group AB and if these be considered universal recipients tragedy may follow , " cold agglutination," if not recognised, may lead to the same result Provided the Landsteiner group has been determined correctly the hazard of incompatibility is negligible in the case of a first transfusion except late in pregnancy and in the puerperium

UNIVERSAL DONORS

In theory it is always better to make a homologous transfusion because both corpuscles and plasma are compatible And there has long been an impression that it is not only economically wrong to make routine use of universal donors but also that these donors are by no means always safe or ideal There can be no doubt that most disasters with group O donors have been due to misgrouping , at a first transfusion these donors contribute also two rare additional risks described below —high titre α and β agglutinins in their plasma, and the presence in the recipient of the very rare anti-O (α.) agglutinin , otherwise, except in pregnant and puerperal women, they are as safe as a homologous donor But, as with all repeated transfusions, the group O donor may immunise the recipient because certain group O corpuscles are antigenic [12] , the O factor is a positive one and does not merely indicate absence of A and B Instances *of this type of disaster have been reported* [21 30] *after* repeated transfusions of group O blood but in view of more recent discoveries it seems probable that these accidents were due to factors other than O, the so-called " intragroup " incompatibility At this point I would emphasise the enormous importance of the direct grouping test properly performed supplemented by the simple biological test, the slow injection of the first 20 c cm of the transfusion, whenever multiple transfusions are necessary even though—perhaps especially if—the same donor is used Once compatible always compatible is fallacious

SUBGROUPS A_1 AND A_2

Groups A and AB are each subdivided into two by reason of what are known as A_1 and A_2 factors The most marked difference between A_1 and A_2 is the quantitative one already emphasised, that the A_2 factor is relatively insensitive to agglutination and especially so when in combination with the B factor in subgroup A_2B [3] A_1 is some four times as common as A_2 and A_1B 1½ times as common as A_2B In the vast majority of cases there is no specific differentiation of A_1 and A_2 by corresponding agglutinins α_1 and α_2, the formula of the blood in these groups being $A_1\beta$ $A_2\beta$, A_1Bo and A_2Bo But very rarely there may be the definite qualitative difference as shown by the finding of α_1 and α Some idea of the rarity of this may be gauged from the records [44] of 819 individual tests in which none in either group A_1B or A_1 contained an α_2 agglutinin and about 0 5% contained α_1 agglutinin mostly in the rarest of all groups, A_2B Although it is the rarest, α_2 is of course the greatest menace, because it is not only anti-A_2 but also anti-O [9] , for this reason it is regarded as a very irregular and abnormal agglutinin

In practice the transfusion of A_1 to A_2 and vice versa is usually without action , the transfused cells survive normally But very rarely the body recognises the distinction between the subgroups and regards the heterologous subgroup as foreign to its economy , these are the occasional cases when α_1 and α_2 are well developed Here again, a first transfusion usually passes without undue alarm, perhaps without incident If the agglutinin is weak the hæmolysis is gradual, the so-called " inapparent " type, and is often only suggested by the fact that the transfused cells do not survive and therefore fail to maintain a raised hæmoglobin for any length of time But the seed has been sown, the antigen implanted, and it is the second and later transfusions which may be associated with smart reactions, especially if the same donor is used The commonest isoimmunisation is of group A_2 against A_1 [44] but this is probably because the α_1 agglutinin occurs more frequently in the natural state , isoimmunisation is at least more efficient if not entirely restricted to those cases who have an initial natural agglutinin Nevertheless immunisation of A_1 to A_2 has been reported [18] not only as the result of A corpuscles but also from an O transfusion,[46] which is only to be expected in that the α_2 agglutinin is also anti-O This indeed may be part, but only part, of the real explanation for developed incompatibility to a group O donor

Isoimmunisation may be effected not *only by direct* transfusion but also by the antigenic stimulus of a heterologous fœtus in utero The isoimmunisation of an A_2 mother by an A_1 fœtus has been reported [44] This adds one more *hazard to* what is usually called a physiological process—pregnancy—should the mother during pregnancy, parturition or puerperium stand in need of blood-transfusion

FACTORS M, N AND P

As to intragroup incompatibility involving the inherited factors M, N, and P, there have been reported only 3 cases of isoimmunisation to factor M, one to factor P and none at all to N [43] [47] No naturally occurring agglutinins to these factors have been recorded though thousands of examinations have been made The hazard from such sources is negligible

RHESUS FACTOR

Great prominence has recently been given in the medical press to what is known as the rhesus or Rh factor [19] which is apparently present in 85% of human bloods, the remaining 15% (Rh –) do not possess this factor nor have they normally any natural isoantibodies in the plasma [45] But in certain circumstances, as the result of a transfusion or transfusions, or again from a fœtus in utero, a rhesus negative individual may develop the corresponding agglutinin [45], this apparently occurs gradually, the agglutinin being at first weak, next active only in the cold and lastly active at 37° C [33] Those who have made most study of the factor consider it is far more often responsible for the hæmolytic reactions which follow the transfusion of homologous Landsteiner blood than any of the other abnormal or irregular agglutinins such as those found in the subgroups of A [45] The detection of Rh factor requires a special technique [45] and a special serum but it is clear that for repeated transfusions and for pregnant and puerperal cases it is advisable to use Rh – donors When the factor itself cannot be specifically determined or excluded, protection should be sought with a carefully performed direct grouping test (using small tubes at a low temperature) as well as the biological test

The discovery of this factor has suggested an explanation of those hæmolytic tragedies of birth, erythroblastosis fœtalis and allied conditions [20] The mother, immunised by the Rh + fœtus, passes back through the placenta the destructive antibody which wreaks havoc on the fœtal blood This attractive theory has much to commend it as it offers an explanation of the origin of the hæmolytic process in utero as well as its familial nature, it is supported by finding that no less than 101 mothers out of 111 were Rh – [20] The importance of the rhesus factor has been proved by the reports that rhesus-positive transfusions have caused reactions whereas a subsequent rhesus negative transfusion was uneventful [33]

I have dealt at some length with these rare subgroup and more common intragroup incompatibilities because it is most necessary to view them in their right perspective The rhesus factor is the probable explanation of some of the hazards that have previously been attributed to the group O donor Thousands of successful transfusions have been performed in the past in ignorance or to the neglect of the existence of subgroups and intragroup factors The important point to appreciate is that, except during pregnancy and the puerperium, the risk is almost non-existent at a first transfusion But with pregnancy, in the puerperium and with all repeated transfusions the risk must be eliminated

HIGH TITRE AGGLUTININS

I have dealt so far with factors which concern the compatibility of the donor's corpuscles with the recipient's plasma But there is always the possibility, particularly with universal donors, of the transfused plasma being of a titre sufficiently high to destroy the corpuscles of the recipient The protection against this is the rarity with which really high titre agglutinins are found, the diluting action of the recipient's plasma which is usually several times the volume of the transfusion itself, and the natural absorptive antigenic factor found in all cells of the body [43], A and B factors are not confined to red corpuscles In actual practice this danger has rarely been found, even under war conditions where massive transfusions of heterologous group O blood have been given to those so exsanguinated that the dilution safeguard hardly comes into operation Advances have been made towards its elimination altogether by the preparation of pure A and B factors which may be added to group O blood to absorb agglutinins before transfusion, this work is still in the experimental stage [49] Plasma and serum transfusions carry a definite risk of such a reaction unless precautions have been taken to remove agglutinins by cross absorption or to render them impotent by bulk pooling It is perhaps worth noting that plasma and serum have both a small content of agglutinogen as well as agglutinin [28], this helps in cross absorption when pooling is practised

COLD AGGLUTININS

Normal isoagglutinins are more active at a low temperature than at body temperature Likewise the irregular or abnormal agglutinins that are concerned with incompatibility are sometimes only feebly active at body temperature [17] [38], their presence may be readily detected at low temperature but their action in vivo is so slow that their destructive action is inapparent and associated with no clinical symptoms More striking still is the apparent biological paradox, the so-called autoagglutinin, better called cold agglutinin, which is active only at temperatures of 30° C or lower and which is found in certain hæmolytic diseases such as paroxysmal hæmoglobinuria as well as other conditions This phenomenon is more of a nuisance than a menace and can be classed as a hazard only when it has intruded to obscure a proper grouping test or when it has passed unrecognised and the operator administers blood which has not been properly warmed Cold blood given to a patient with well-developed cold agglutinins will induce a hæmolytic crisis comparable to the disaster of a grossly incompatible transfusion I have been consulted a number of times and told that the patient by indirect test appears to be a group AB—a universal recipient—whereas paradoxically, by direct test mercifully performed, he appears to be a universal incompatible even with universal-donor blood The answer to this riddle has always been autoagglutination The advice given has been to perform the indirect grouping test at 37° C (and so determine the correct group) and likewise with the direct test, whilst the transfusion itself is to be given with warm blood and a warm patient One other practical difficulty arises and that is that the cool conditions so favourable to the detection of intragroup and other abnormal incompatibilities favour the intrusion of natural or pathological cold agglutinins which might otherwise pass unnoticed In a laboratory it is relatively easy to carry out a direct grouping test which eliminates intragroup and subgroup hazards and excludes as well the fallacy of cold agglutination [47]

STORED BLOOD

There have been many reviews [3] [8] [13] of the nature and number of reactions which follow the transfusion of stored blood, and in general it is concluded that these are no more frequent than with fresh blood provided the storage period has not exceeded 3 weeks Under pressure of circumstances blood up to 7 weeks old has been given without accident [26] but 14 days or less should be regarded as providing a blood more likely to achieve the therapeutic result desired Degenerate stored blood suffers the same fate as incompatible blood—it is rapidly hæmolysed or a least that part of it which is degenerated—and death from such a cause has been reported [6] There is now a very grave danger that the convenience of the blood bank may sometimes, if not frequently, lead to the neglect of the therapeutic ideal [42] It is so much easier to get a bottle of blood from a refrigerator than to obtain blood fresh from a donor that it may be forgotten that stored blood contains no leucocytes after a few hours, that the content of prothrombin and other clotting elements, complement and antibodies, gradually declines, and that the survival of the transfused corpuscles, if the blood is more than 14 days old, is inversely proportional to the age Stored blood is excellent for blood-volume restoration in case of hæmorrhage but cannot compare with fresh blood when the maximum survival of red cells is desired or when it is wished to contribute the largest amount of the more ephemeral elements

TREATMENT OF INTRAVASCULAR HÆMOLYSIS

The fortunately rare accident of incompatibility does not lend itself to statistical study for the assessment of the correct treatment The accepted method, based on experimental work,[2] is alkalinisation of the urine in order to keep pigment debris in solution and prevent death from renal blockage Apart from alkalinisation which initial hæmoglobin is below 25%, with cachexia, with cardiac disorders or respiratory embarrassment the rate should be reduced to 0 5 c cm , in these too, restoration of hæmoglobin to a normal level should be achieved by transfusion at intervals rather than at one session These rates should not be exceeded even for short periods If these principles are adhered to the circulation has time to adapt itself to the increased blood-volume and to extrude the unwanted plasma The danger of overloading in the course of a massive transfusion to these chancy subjects with feeble cardiac muscle has been greatly reduced by the use of concentrated red-cell suspension transfusions which call for no effort to eliminate the unwanted plasma[24,48] Vascular accidents such as retinal hæmorrhage are not uncommon with nephritis or with the blood dyscrasias[7]

Intravascular Hæmolysis

Compatibility provides a fascinating study The hazard to be faced, with gross incompatibility, is agglutination and lysis of the cells leading sometimes to immediate death or more often to death in the course of a few days, but a fatal issue is by no means inevitable even when large amounts are transfused The symptoms of such a disaster include violent pain in the back, rigor, respiratory embarrassment, circulatory collapse, hæmoglobinuria, hæmalbuminæmia, jaundice, urticaria and symptoms due to small hæmorrhages or emboli in the brain, mesentery, endocardium and gastro-intestinal mucosa ; the terminal stages of those who survive the immediate so-called " hæmolytic shock " are characterised by renal failure A number of studies[28,46] have been made on surviving cases which throw light on the mechanism of much rarer but nevertheless similar reactions due to factors additional to the Landsteiner groups, and especially on the extra risks which are run by pregnant women and by those who have to receive multiple transfusions

LANDSTEINER GROUPS

The transfusion of incompatible corpuscles introduces into the circulation an antigenic foreign protein The result is the classical antigen-antibody reaction The contributed agglutinogen first absorbs the circulating agglutinin so that in the early phases the offending agglutinin may not be detectable in samples of the recipient's serum[28] Thus, A corpuscles given to an O recipient may temporarily remove all the α agglutinin which the latter should possess This is a trap which should be borne in mind by those called on to investigate such a disaster But the remote effect, should the recipient survive the first insult, is stimulation of the agglutinin to a very high level There must be quite a number with weak agglutinins who have survived an incompatible transfusion with mild, unnoticed or disregarded symptoms But woe betide them if they be later transfused from the same, apparently compatible, donor

Landsteiner group compatibility—the A, B, O factors —depends for safety entirely on properly performed grouping tests, the correct procedure for which has been fully described[36] The menace of a blood-grouping test wrongly performed can be appreciated from an analysis of 7 transfusion fatalities of which 2 were due to group A wrongly determined as O[7], 4 out of 6 in another series were also due to wrong grouping[6] In these days of mass grouping and large blood banks of group O blood, errors not only technical but also clerical have to be carefully guarded against No-one nowadays would send out blood guaranteed to be a certain group without a careful recheck of both cells and serum The greatest danger is the use of impotent serum or of serum not sufficiently potent to detect with ease the insensitive A_2 factor in the subgroups A_2, and especially A_2B, so that these groups are mislabelled O and B respectively with disastrous results when used as donors Infected serum, which has panagglutinating properties or infected corpuscle suspensions, may lead to the wrong determination of group AB and if these be considered universal recipients tragedy may follow , " cold agglutination," if not recognised, may lead to the same result Provided the Landsteiner group has been determined correctly the hazard of incompatibility is negligible in the case of a first transfusion except late in pregnancy and in the puerperium

UNIVERSAL DONORS

In theory it is always better to make a homologous transfusion because both corpuscles and plasma are compatible And there has long been an impression that it is not only economically wrong to make routine use of universal donors but also that these donors are by no means always safe or ideal There can be no doubt that most disasters with group O donors have been due to misgrouping , at a first transfusion these donors contribute also two rare additional risks described below —high titre α and β agglutinins in their plasma, and the presence in the recipient of the very rare anti-O (α.) agglutinin , otherwise, except in pregnant and puerperal women, they are as safe as a homologous donor But, as with all repeated transfusions, the group O donor may immunise the recipient because certain group O corpuscles are antigenic[12], the O factor is a positive one and does not merely indicate absence of A and B Instances of this type of disaster have been reported[21,30] after repeated transfusions of group O blood but in view of more recent discoveries it seems probable that these accidents were due to factors other than O, the so called " intragroup " incompatibility At this point I would emphasise the enormous importance of the direct grouping test properly performed supplemented by the simple biological test, the slow injection of the first 20 c cm of the transfusion, whenever multiple transfusions are necessary even though—perhaps especially if—the same donor is used Once compatible always compatible is fallacious

SUBGROUPS A_1 AND A_2

Groups A and AB are each subdivided into two by reason of what are known as A_1 and A_2 factors The most marked difference between A_1 and A_2 is the quantitative one already emphasised, that the A_2 factor is relatively insensitive to agglutination and especially so when in combination with the B factor in subgroup A_2B[3] A_1 is some four times as common as A_2 and A_1B 1½ times as common as A_2B In the vast majority of cases there is no specific differentiation of A_1 and A_2 by corresponding agglutinins α_1 and α_2, the formula of the blood in these groups being $A_1\beta$ $A_2\beta$, A_1Bo and A_2Bo But very rarely there may be the definite qualitative difference as shown by the finding of α_1 and α_2 Some idea of the rarity of this may be gauged from the records[44] of 819 individual tests in which none in either group A_1B or A_1 contained an α_2 agglutinin and about 0 5% contained α_1 agglutinin mostly in the rarest of all groups, A.B Although it is the rarest, α_2 is of course the greatest menace, because it is not only anti-A_2 but also anti-O[9], for this reason it is regarded as a very irregular and abnormal agglutinin

In practice the transfusion of A_1 to A_2 and vice versa is usually without action , the transfused cells survive normally But very rarely the body recognises the distinction between the subgroups and regards the heterologous subgroup as foreign to its economy , these are the occasional cases when α_1 and α_2 are well developed Here again, a first transfusion usually passes without undue alarm, perhaps without incident If the agglutinin is weak the hæmolysis is gradual, the so-called " inapparent " type, and is often only suggested by the fact that the transfused cells do not survive and therefore fail to maintain a raised hæmoglobin for any length of time But the seed has been sown, the antigen implanted, and it is the second and later transfusions which may be associated with smart reactions, especially if the same donor is used The commonest isoimmunisation is of group A_2 against A_1[44] but this is probably because the α_1 agglutinin occurs more frequently in the natural state , isoimmunisation is at least more efficient if not entirely restricted to those cases who have an initial natural agglutinin Nevertheless immunisation of A_1 to A_2 has been reported[18] not only as the result of A_2 corpuscles but also from an O transfusion,[46] which is only to be expected in that the α_2 agglutinin is also anti-O This indeed may be part, but only part, of the real explanation for developed incompatibility to a group O donor

Isoimmunisation may be effected not only by direct transfusion but also by the antigenic stimulus of a heterologous fœtus in utero The isoimmunisation of an A_2 mother by an A_1 fœtus has been reported[44] This adds one more hazard to what is usually c

DIFFUSION OF SULPHANILAMIDE, ACRIFLAVINE AND GENTIAN VIOLET

E A LUM, PH C

LATELY CHIEF CHEMIST, SULFARSENOL LABORATORIES LTD

THE work of Hawking[1] on the diffusion of various sulphonamides through agar gels has shown that the distance travelled by saturated solutions of these compounds through tubes of agar gel depends on their solubilities He also suggested that the distance travelled by the solutions varies with the square root of the time The following are typical distances travelled during the first 24 hours by saturated solutions of sulphonamides placed in contact with the gel at 35° C in a test-tube 1 cm in diameter

Sulphanilamide 4 2 cm	Sulphapyridine 2 6 cm
Sulphaguanidine 3 1 cm	Sulphadiazine 2 cm
Sulphathiazole 2 7 cm	

Hawking used the agar gels as laboratory models of body tissues and fluids

In this paper diffusion experiments are described in which agar gels and dead tissue were used The compounds tested were sulphanilamide (the sulphonamide most widely used for implantation into wounds), acriflavine and gentian violet The two latter are in common use as wound antiseptics, gentian violet being of particular use in the treatment of burns

AGAR GELS

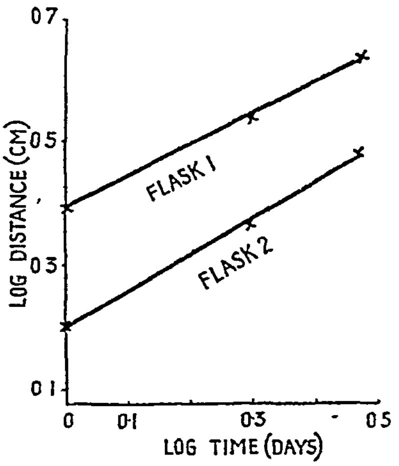
In the first series of experiments glass test-tubes, 1 1 cm in diameter, were filled with 4% agar made with bicarbonate-free Locke's solution (sodium chloride 9 g, potassium chloride 0 2 g, calcium chloride 0 2 g in 1 litre of water) For the sulphanilamide diffusion tests, 1 25 ml of Ehrlich's reagent (p-dimethylaminobenzaldehyde 1 57 g, hydrochloric acid 20 ml, water 100 ml) was added to each 100 ml of agar get just before it was poured into the tubes When in contact with sulphonamides this reagent produces a yellow colour in the gel which can readily be seen and measured In the cases of acriflavine and gentian violet the distance the solutions have diffused can be judged by the spread of colour in the agar In all these experiments the agar tubes were suspended in an inverted position in a conical flask containing 1 litre of the appropriate solution, the open end with the agar trimmed flat hanging just below the surface of the liquid After the stated times the distance between the interface and the point at which the colour was just visible was measured with a millimetre scale (table I)

TABLE I—EXPERIMENTS WITH AGAR GELS AT 15° C

Flask	Concentration		Solubility at 16° C (%)	Distance (cm) diffused after		
				24 hr	48 hr	72 hr
1	Sulphanilamide	0 1%	0 42	2 5	3 4	4 3
2		1/2000 g-mol per l		1 6	2 3	3
3	Acriflavine	0 1%	33 3	0 6	0 8	
4		1/2000 g-mol per l		0 4	0 7	0 9
5	Gentian violet	0 1%	4	0 65	0 9	
6		1/2000 g-mol per l		0 6	0 9	1 2

Strengths of solutions containing 1/2000 g-mol per litre are sulphanilamide, 0 086 g per l, acriflavine, 0 148 g per l, gentian violet, 0 203 g per l The use of these solutions enables solutions of strengths based on molecular weights to be compared

In the case of sulphanilamide my results, taken in conjunction with those of Hawking[2] (see table below), suggest that the rate of diffusion decreases with the decrease in concentration of the solution My figures are of the same order as those of Hawking, but as he has shown the actual diffusion is slow through dead tissue, and the concentration therein is less than my figures suggest



Rate of diffusion of sulphanilamide—through agar Flask 1, sulphanilamide 0 1% Flask 2, sulphanilamide 1/2000 g mol per litre

In order to analyse the results obtained with the two solutions of sulphanilamide still further the logarithm of the distance travelled by the solutions up the agar tube was plotted against the logarithm of the time, the points, for both solutions, fall almost on a straight line (see figure) This confirms the results obtained by Hawking using a saturated solution of sulphanilamide at 16° C and in all three cases the lines correspond to the equation

$$\log x = b \log t + \log k$$

where x is the distance in cm travelled from the interface, t is the time in days, b is a constant representing the slope of the line, and k is a constant equal to the distance in cm travelled by the solution on the first day The figures for b and k obtained in the present experiments, with those obtained by Hawking (marked with asterisk) were as follows

Conc of sulphanilamide	*Days*	*b*	*k*
Saturated sol (0 42 %)	1	0 468*	2 93*
0 1%	2	0 447	2 5
1/2000 g-mol per l	2	0 537	1 6

The figures for b under these different conditions are, within experimental error, closely similar and as Hawking has pointed out 0 5 may possibly be the true figure in each case If so, the distance travelled by the solution up the agar tubes would vary directly with the square-root of the time

ACRIFLAVINE AND GENTIAN VIOLET

If the diffusion figures for gentian violet and acriflavine are plotted as in the figure the points do not fall so neatly on a straight line as they do with sulphanilamide Because of this, and because, though the solubilities of acriflavine and gentian violet are greater than that of sulphanilamide the rates of diffusion are considerably less, it is clear that another factor must be taken into account in these two cases This factor inhibits diffusion, as shown below

After 48 hours the deeply coloured portion of the agar from flask 3 (0 1% solution) and flask 5 (0 1% solution) was cut off with a razor, washed quickly to remove surplus solution and cut into small pieces in distilled water After 24 hours immersion it was found that in both instances only a very dilute solution of acriflavine or gentian violet had been produced and the pieces of agar gel remained deeply coloured throughout Moreover, the gel was almost unswollen after its immersion in the water, though normal agar swells under such conditions

---

[1] Hawking, F *Quart J Pharm* 1941, **14**, 226

[2] *Lancet*, 1941, i, 786

BRIGADIER WHITBY REFERENCES (*continued*)

31 Plummer N S (1936) *Brit med J* ii, 1186
32 Riddell, V H (1939) Blood Transfusion, London
33 Scott, O E and Conant, J S (1941) *Amer J clin Path* 11 536
34 Sharpey Schafer E P and Wallace, J (1942) *Lancet*, in press
35 Taylor, G L, Race R R, Prior, A M and Ikin, E W (1940) *Brit med J* i, 297
36 — — — — (1942) *J Path Bact* 54, 81
37 Thomas, W L Keys S and Dyke S G (1936) *Lancet*, i, 586
38 Thomsen O (1928) *ImmunForsch* 57 307
39 Thoroughgood J C (1940) *Chin med J* 58, 682
40 Traum E (1932) *Dtsch Z Chir* 257, 97
41 War Office Memorandum 1941 Resuscitation H M Stationery Office
42 Whitby, L E H (1941) *Proc R Soc Med* 34, 257
43 Wiener A S (1939) Blood Groups and Blood Transfusion, Baltimore 2nd ed. p 94
44 — (1941) *J Immunol* 41, 181
45 — (1941) *Arch Path* 32 227
46 — Oremland, B H, Hyman M A and Samwick A A (1941) *Amer J clin Path* 11, 102
47 — and Peters, H R (1940) *Ann int Med* 13, 2306
48 Williams G E O and Davie T B (1941) *Brit med J* ii, 641
49 Witebsky, F Klendshoj N C and Swanson P (1941) *J Amer med Ass* 116, 2654

requires the administration by mouth or intravenously of approximately 35 g. potassium citrate every 24 hours, it is essential to ensure an adequate output of urine with a generous fluid intake [5] Many do not now accept the renal blockage theory as the cause of the renal failure, which they ascribe to damage caused to the kidney by arterial spasm and ischæmia [11] On clinical grounds this view is supported by the striking and constant early symptom of lumbar pain before pigment deposition can have come into the picture This symptom has always impressed me as the most important early indication of a definitely incompatible transfusion The spasm is said to be due to the release of depressor substances from the broken down erythrocytes which cause arterial spasm, dilatation of the capillary bed and a sharp fall in blood-pressure Alkalinisation tends to relieve the spasm, but a treatment said to be more effective,[11] and one which is rarely considered is the prompt (at least within 24 hours) transfusion of 200–300 c cm of compatible blood This is said to relieve the condition at once, while a mere syringeful, 20 c cm, is said to relieve pain

Transmissible Disease

The last hazard is that of transmissible disease Syphilis comes first to mind but the incidence of the disease is so low in most parts of this country that the risk is not great, in a series of several thousand unselected donors in the West Country the incidence of a positive serological test has been less than 0 5%[1], up to the time of the war some 40 cases had been reported [4] in Europe and America The usual safeguard is a serological test on the donor, which should obviously be performed at the time of taking the blood rather than in advance The limitations of this safeguard should be appreciated, the *late primary or early secondary stages of syphilis*, times when the serological test is often negative or at least doubtful, are the most infectious periods, whereas a chronic tertiary with a strongly positive serological test is probably quite innocuous Storage of blood affords considerable protection in that virulent spirochætes appear unable to survive in this medium for more than 4 days Filtration of plasma and serum removes the chance of transmission so that serological tests are unnecessary when such processing is carried out

Stored blood, and unfiltered plasma or serum, carry the risk of bacterial contamination sufficient to induce at least a pyrexial reaction and at most, fortunately rarely, a virulent and fatal septicæmia Experience has shown that the contamination-rate of blood is fairly high, and if there are also the manipulations necessary to separate plasma or serum the incidence is increased Refrigeration at 4–6° C is some protection in that it inhibits rapid growth, but many bacteria survive and even multiply at this temperature and certainly if the refrigerated blood be allowed to warm up Care of a blood bank is a great responsibility, frequent inspection is necessary as well as experience in the detection of early suspicious signs of contamination, while all should be warned that once blood has been removed from a refrigerator it must be used without delay, it must never be allowed to warm up and then be restored to the refrigerator for another occasion Unfiltered plasma is a dangerous fluid, its natural turbidity obscures any turbidity due to bacterial contamination—the simplest macroscopic test of fitness for use There has been little or no report of transference of virus infections though one case of encephalitis transmitted from a donor incubating varicella has been recorded Infective hepatitis, which before the war caused a tragic series of deaths from the use of unfiltered measles serum, has mercifully not been met with

Malaria is a hazard difficult to avoid especially in *malarial endemic centres* *Filtration of plasma or serum* offers a complete protection but for whole blood the danger is considered to be so great that, ideally, no-one should be used as a donor who has ever even resided in a malarial area and certainly no-one who has ever had an attack [3] When these ideals are impossible some protection is afforded by cinchonisation of the potential donor or of the recipient for some days beforehand [39] No great study has yet been made of the survival of the parasite under conditions of blood storage Transmission of malaria has been fairly frequently recorded from donors apparently malaria free but in no more tragic circumstances than that of the newborn infant which received a small intramuscular injection of parental blood and developed a fatal malignant infection [29] Ironically enough it may often be that the donor suffers more than the recipient, the removal of a pint of blood apparently stimulates the marrow, a common latent focus, so that the donor may suffer a malarial attack after years of freedom

Allergy to proteins may be communicated by transfusion [10] especially with repeated transfusions from the same donor,[40] and in normal times it is as well to avoid donors with an allergic history Under war conditions, when much blood is pooled for plasma or serum preparation, the chance of this is very rare Urticarial reactions follow about 1% of transfusions [46]

Conclusions

The majority of hazards are avoidable The simple pyrexial reaction with or without rigor can be almost eliminated by scrupulous cleanliness and technique Experience and good clinical judgment reduce the incidence of circulatory disasters Intravascular hæmolysis from incompatibility will always crop up from time to time if a haphazard technique is used for the indirect or direct grouping tests If the Landsteiner groups have been correctly determined the risk of incompatibility *from other factors is negligible at a first transfusion* But with multiple transfusions and with single or multiple transfusions to women during pregnancy or the puerperium especial care is necessary, for these an elaborate *direct grouping test as well as the simple biological test* should never be omitted The old clinical impression that it is dangerous to employ the same donor for repeated transfusions to the same recipient now seems to be explained by the frequency of rhesus-positive individuals who are potentially dangerous donors for multiple transfusions to a rhesus-negative recipient If circumstances permit, homologous transfusion is the ideal and is greatly to be preferred to the routine use of universal donors, though under war conditions this ideal may not be possible Even with all modern advances there still remain a small number of reactions which arise particularly in patients with chronic medical illnesses though every care has been taken in grouping, these remind us that we are still ignorant of many subtle differences in the composition of human red corpuscles A noted authority [47] has estimated that human corpuscles can be differentiated into 72 blood groups by means of already known factors, very few of these groups are concerned with transfusion work though they often help to explain a disaster Nevertheless these numerous facts indicate the complexity of the subject and suggest that the individuality of the blood may one day be sufficiently well studied to enable a man to be identified or excluded by it in the same way as he may be with finger prints

REFERENCES

1 Army Blood Supply Depot Records 1942
2 Baker, S L and Dodds, E C (1925) *Brit J exp Path* 6, 247
3 Brewer, H F, Maizels, M, Oliver, J O and Vaughan, J M (1940) *Brit med J* ii, 48
4 Burke, E T (1939) *Lancet* ii, 283
5 Bushby, S R M, Hart, E W, Kekwick, A and Whitby, L E H (1940) *Ibid*, ii, 414
6 Daniels, W B, Leonard, B W and Holtzman, S (1941) *J Amer med Ass* 116, 1208
7 De Gowin E L (1938) *Ann int Med* 11, 1177
8 — and Hardin, R C (1940) *Brit med J* ii 1
9 Dockray G C and Sachs H (1941) *J Path Bact* 52, 203
10 Garver W P (1939) *J Allergy*, 11, 32
11 Gesse, E P (reviewed 1936) *J Amer med Ass* 106, 2241
12 Hooker, S B and Anderson L M (1921) *J Immunol* 6, 419
13 Jewesbury, E C O (1941) *Brit med J* i 663
14 Kekwich, A, Maycock, W d'A, Marriott, H L and Whitby, L E H (1941) *Lancet*, i, 99
15 Knott, F A and Leibel, B (1941) *Ibid*, i, 409
16 Kordenat, R P, Smithies, F (1925) *J Amer med Ass* 85, 119
17 Landsteiner, K and Levine, P (1929) *J Immunol*, 17, 1
18 — — and Janes, M L (1928) *Proc Soc exp Biol N Y*, 25, 672
19 — and Wiener, A S (1940) *Ibid* 43, 223
20 Levine, P (1941) *Amer J clin Path* 11, 898
21 — and Stetson, R E (1939) *J Amer med Ass* 113 126
22 Lewisholm, R and Rosenthal, M (1933) *J Amer med Ass* 100, 466
23 McIntosh, J, Fildes, P and Dearden H (1912) *Lancet* i 637
24 MacQuaide, D H G and Mollison, P L (1940) *Brit med J* ii, 555
25 Marriott, H L and Kekwick, A (1940) *Ibid*, i 1043
26 Maycock W d'A (1940) *Ibid*, ii 467
27 — and Whitby L E H (1941) *J R Army med Cps* 77, 173
28 Mollison, P L and Young, I M (1941) *Lancet*, ii 635
29 Nabarro, D and Edward D G ff (1939) *Ibid* ii 556
30 Neter, E (1936) *J Immunol* 30, 255

Continued at foot of opposite page

previous 10 days, lassitude, swelling of ankles, dyspnœa on exertion and leg pains He had had 17 years' service, 2 years overseas on present tour, one in Iraq and one in Aden There was no history of rheumatic fever, tonsillitis, chorea, diphtheria, scarlet fever or growing pains and he had completed a full course of treatment for syphilis 5 years previously He was employed on administrative duties, lived in the station sergeants' mess and ran the station dance band He drank 3–6 pints of beer daily, and more at the week end when his band played at the officers' club, he had been drinking heavily the previous Christmas

Slightly built and looked pale, tired and ill Pulse rate 90 per min, regular Tongue slightly furred Fauces and lungs normal Well-marked pulsation in carotids, and apex-beat very diffuse in 5th and 6th left interspace 4 in from midline Dullness on percussion half an inch from right border of sternum Heart sounds forcible and second sound reduplicated at apex and base Systolic bruits heard over carotids Blood pressure 122/48 mm Hg Liver smooth, palpable 1 in below left costal margin Spleen not palpable Œdema over both ankles Weakness of both legs with muscle tenderness and hypoæsthesia over both tibiæ Knee- and ankle jerks absent, plantars flexor and other reflexes sluggish Urine slight trace of albumin but no casts Blood picture slight secondary anæmia Kahn reaction negative Fluid intake (24 hours) 52 oz, output 12 oz

On May 12 he was ordered 5 mg of vitamin B_1 ('Benerva') twice daily intramuscularly, this was increased to thrice daily on the 13th and altered to 1 mg t d s on the 14th This dosage was continued till the 19th, when 43 mg had been given in all 'Betaxan' tablets, 2 t d s, were then substituted 'Bemax' and 'Marmite' were given throughout Fluid intake remained about 50 oz, but urinary output rose to 104 oz on May 14 By May 16 œdema had disappeared, heart and liver had shrunk and there was general improvement Blood-pressure 120/78 mm Hg By June muscle tenderness had almost disappeared though other CNS signs were unchanged Lumbar puncture gave a fluid normal in pressure and chemistry and with a negative Kahn reaction On June 29 he was up all day, but on July 3 he developed acute otitis externa from which he had recovered on July 10

He was fit for discharge on July 18 to light duty and fit for full duties three weeks later On discharge slight tenderness of legs on deep pressure persisted, ankle reflexes could just be obtained and knee jerks on reinforcement

Case 2—A battery quartermaster sergeant, aged 33, was admitted to hospital on July 8, 1941, complaining of dyspnœa, cough and anorexia for 3–5 weeks Swelling of ankles had appeared 4 days before admission No previous medical history of importance He had never suffered from rheumatic fever, sore throats, scarlet fever, chorea, diphtheria or bronchitis He had served for 2½ years in Aden, mainly on office duties He said his alcohol intake was 3–4 pints of beer daily, though messmates suggested that it was much higher He lived in his unit sergeants' mess

He was stoutly built, cyanosed and his neck veins were congested Pulse rate 108 per min, regular Apex-beat in 5th left interspace 4 in from midline Dullness 1 in to right of sternum Aortic sounds faint, systolic and diastolic murmurs in 3rd left interspace and systolic murmur at apex Blood pressure 124/48 mm Hg Liver smooth, tender and palpable 2 in below costal margin Lungs fine crepitations at both bases Œdema over both ankles Urine sp gr 1016, normal No evidence of disease in CNS Given tincture of digitalis min 80 four-hourly On July 9 he had min 120 and on the 10th min 100, when it was discontinued, total min. 320 Pulse rate remained regular at 100–118 and condition was unchanged Dyspnœa and distress were well-marked and morphia gave little relief Fluid intake remained about 50 oz and urinary output 20–40 oz On evening of July 10 venesection (one pint) followed by morphia gr ¼ gave relief but œdema and congestion persisted next day 'Salyrgan' 1 c cm was given intravenously on July 11 and 2 c cm on the 13th with no effect On the 14th pulse rate 118 and signs unchanged Vomited twice in the morning and complained of cardiac pain At midday tinct digitalis min 40 four hourly was recommenced and 10 mg vitamin B_1 (benerva) given intramuscularly On the 15th pulse rate 76, œdema had almost disappeared, urinary output 86 oz, and patient had much improved On the 16th digitalis was omitted (min 360 had been given) and daily injections of 10 mg vitamin B_1 continued

On July 20, when intramuscular vitamin B_1 was discontinued and bemax and marmite substituted, there was no evidence of cardiovascular disease As his foreign tour was almost completed he was transferred on that date to a hospital ship for England

DISCUSSION

The first case, showing cardiac enlargement and peripheral neuritis, fits into Aalsmeer and Wenckebach's group 2 I was unwilling to diagnose the second case on admission as an alcoholic beriberi but the failure to respond to rest, digitalis and salyrgan, followed by the rapid response to vitamin B_1 combined with digitalis, confirmed the diagnosis and the case belongs to group 3 Heavy doses of intramuscular vitamin B_1 were given to these patients but the response would probably have been as satisfactory with smaller dosage The men came from widely separated units, and the diets in all units were investigated and showed no lack of vitamin B_1 No other cases suggestive of even minor deficiencies could be found Hospital records show no evidence of previous similar cases Jones and Bramwell suggest that minor degrees of deficiency may be common and unrecognised and may contribute to the development of cardiac failure in patients with rheumatic fever, or syphilitic or hypertensive heart disease

I am indebted to Wing Commander H Penman, officer commanding the RAF Hospital, Aden, for permission to publish these notes

---

EFFICIENCY OF THE ROSE AND SELLORS MASK

R S Aitken
M D N Z, F R C P
PROFESSOR OF MEDICINE IN THE UNIVERSITY OF ABERDEEN

Alison B Cruickshank
M B ABERD
TEMPORARY ASSISTANT IN MEDICINE AT THE UNIVERSITY

We have tested the efficiency of a slightly modified form of the improvised oxygen mask described by Rose and Sellors[1] The modified form is made from X-ray film cut in the shape shown in fig 1, AB and AB′ are sewn together with about 1 in overlap, the perforated rubber tube is attached along this junction for about 4 in, XBB′ Y is reinforced with copper wire and bound with lint, and the tapes are attached at X, Y, c and d When the mask is applied to the patient, the wire-reinforced edge has to be moulded to give close contact with the skin under the chin and up to the level of the ears, and the mask should be adjusted to leave a space of about 2½ in between its upper part and the patient's forehead

Alveolar air concentrations of oxygen and carbon dioxide were determined in 6 subjects after breathing oxygen supplied at varying rates of flow through this mask In each case the subject lay on his back, with his head on a pillow, and the mask was held in position by an assistant Oxygen at any given rate was breathed for 5 min Then, on a word of command, the subject held his breath (at the end of an expiration or of an inspiration), the mask was quickly removed and the mouthpiece of a straight 1 in diameter tube, 4 ft long, was placed in the subject's mouth As soon as the mouthpiece was in position the subject expired fully into the tube with closed nostrils, and a sample of air was taken from its proximal end into an evacuated sampling tube The samples were analysed on a large Haldane apparatus. After a little initial training all the subjects gave reasonably consistent results These are set out in the table and the alveolar oxygen concentrations are plotted against the rate of flow of oxygen in fig 2 From these it will be seen that alveolar oxygen concentrations between 40% and 60% are readily obtained with rates of flow between 4 and 6 litres This is a higher concentration than is usually attained with oxygen administration

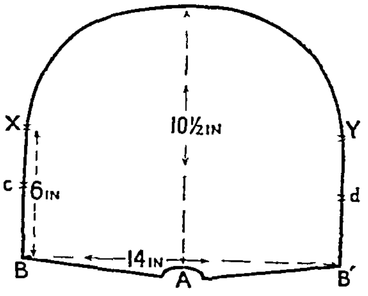


Fig 1—Dimensions of mask cut from X ray film

---

[1] Rose, A and Sellors, T H *Lancet* 1940, i, 648

Evidently the acriflavine and gentian violet have become fixed on the agar, the action probably being similar to that of some dyes when they come into contact with bacteria and certain body cells. The fixation of these compounds by the agar accounts for the comparatively slow rate of diffusion as compared with that of sulphanilamide, and suggests that in the treatment of wounds containing dead tissue the diffusion of acriflavine and gentian violet through such tissue would be very slow after fixation had occurred. In view of these results with laboratory models of body tissues and fluids, experiments with actual dead tissue were carried out.

Dead-tissue experiments.—Thin strips of dead mouse subcutaneous and cutaneous tissue (1–1.5 mm. thick) were suspended in a 0.1% solution of acriflavine and similar strips in a 0.1% solution of gentian violet. After 5 hours the strips were removed from each solution and washed to remove any surplus liquid. In both cases the tissue was found to be deeply impregnated with the solution, the deeper subcutaneous layers being more heavily coloured than the immediate cutaneous layers. The tissue was then cut into smaller strips and allowed to stand in water for 36 hours, after which the water was found to be lightly coloured in both instances, the tissue remaining deeply impregnated with the acriflavine or gentian violet. These results are identical with those obtained with the agar gel and it is evident that dead body tissues can fix both acriflavine and gentian violet.

TABLE II—RESULTS WITH STAB CULTURES IN TREATED NUTRIENT AGAR

Tube	Organisms	Results	
		At 24 hr.	Between 48 and 72 hr.
1a	Mixed culture from throat swab	Little growth	Growth over whole length of stab
1b			Some growth below end of diffusion-line only
1c			Distinct growth below end of diffusion line only
2a	Mixed anaerobic from milk*	Little growth	Heavy growth almost whole length of stab
2b			As 1b, agar split by gas
2c			As 1c, agar split by gas

* Including *Clostridium welchii*.

1a and 2a = control tubes; 1b and 2b = tubes treated with gentian violet; 1c and 2c = tubes treated with acriflavine.

Bacteriological tests.—It was important to know whether this fixation resulted in the loss of bactericidal power of these antiseptics, and experiments were therefore carried out to decide this. In the first series agar plates were prepared each containing the same quantity of sterile nutrient agar made with 5% agar gel. This strength was used in order to limit to some extent the depth of diffusion, which would have been much greater if the usual 2% gel had been employed. Equal numbers of plates were used as controls, and for the acriflavine and gentian violet experiments. Groups of plates were prepared as follows:

Group A. 5 c.cm. sterile water added to control plates.
„ B. 5 c.cm. 1 in a 1000 solution of acriflavine added to each plate.
„ C. 5 c.cm. 1 in a 1000 solution of gentian violet added to each.

After standing for 90 min. the liquid was poured from the surface of the agar of all the plates, and they were all—including the control plates—washed under running water for 30 min. in order to remove all traces of free acriflavine and gentian violet. The surface of each plate was then dried with sterile filter paper. In groups B and C diffusion was found to have taken place through about ⅔ of the depth of the gel. At the end of the experiments it was proved that no free dye remained in the gel by cutting up the gels of groups B and C and allowing them to stand in distilled water; very little colour appeared in the water after many hours. Each plate in groups A, B and C was then inoculated heavily with a culture prepared from a throat swab and incubated at 37° C. After 24 hours distinct growth was obvious on the plates in group A but there was no growth on plates in groups B and C. After 7 days' incubation there was still no growth on plates in the two latter groups but the growth on group A plates had distinctly increased.

A further series of experiments was performed using test-tubes ⅓ full of sterile nutrient agar (5%) and treated in the same manner as the plates in groups A, B and C. In this case the distance of diffusion in the acriflavine and gentian violet tubes was about ¼ of the depth of the agar. Two inoculations were made by the stab method into each group (table II).

From these results it appears that when acriflavine and gentian violet are fixed by agar gels, and hence very probably by dead body tissue, the antiseptic properties are not abolished. These tests would not, of course, detect an impairment of 50–75%.

DISCUSSION

From the diffusion experiments it is clear that the presence of much dead tissue in a wound will prevent gentian violet and acriflavine from reaching healthy tissue to the most desirable extent since the fixation by dead tissue greatly inhibits diffusion of these substances. The results of the bacteriological experiments, however, suggest that in wounds containing dead tissue acriflavine or gentian violet will not become so fixed by dead tissue, that they are prevented from acting as antiseptics, and that they impregnate dead tissue sufficiently deeply to prevent them from serving as foci of infection. Thus while thorough removal of the dead tissue from wounds is desirable it seems that if wounds are treated with acriflavine or gentian violet any unremoved dead tissue will not act as a nidus for the development of bacteria.

SUMMARY

The rate of diffusion of sulphanilamide through laboratory models of body tissue is greater than that of either acriflavine or gentian violet and its rate of diffusion decreases with decrease in concentration of the solution.

Fixation of acriflavine and gentian violet by dead body tissues greatly restricts the diffusion of these substances. This fixation is permanent. The fixation, however, does not result in loss of antiseptic power and bacteria are unable to grow on laboratory models of dead tissue (nutrient agar) on which acriflavine or gentian violet has become fixed. Growth is rapid on similar agar models which are untreated.

The work described in this paper was carried out in the laboratories of Endocrines Spicer Ltd. and Sulfarsenol Laboratories Ltd., to both of whom thanks are due.

ALCOHOLIC BERIBERI HEART

J. C. BOWE, M.B. BELF., D.P.H.
ACTING SQUADRON LEADER, R.A.F.

ALCOHOLIC beriberi heart is uncommon in Great Britain. Two cases are described here in Europeans who had lived in the tropics for over two years, and lived in messes where the diet was adequate. No other form of vitamin-B_1 deficiency was discovered in their messes or other units.

Aalsmeer and Wenckebach[1] divide cardiovascular beriberi as seen in Java into three groups: (1) a mild ambulatory type with dyspnœa and palpitation; (2) a moderately severe type with cardiac enlargement and polyneuritis; and (3) an acute pernicious form, seen in desperately ill patients with vomiting, dyspnœa and restlessness, epigastric pain, enlarged heart, dependent œdema, engorged veins, tachycardia and a low diastolic pressure. Morgan Jones and Crighton Bramwell,[2] who reported a case and reviewed the literature, say that the diagnosis rests essentially on the dissimilarity of the clinical syndrome from that of heart-failure due to other causes; the absence of the more common ætiological factors responsible for producing heart-failure; the presence of dietary abnormality compatible with a gross deficiency of vitamin B_1; and the response to treatment with vitamin B_1. The condition occurs in chronic alcoholism due to deficient food intake following anorexia and the replacement of other carbohydrates by alcohol which is deficient in vitamin B_1, while high carbohydrate diets require an increased amount of vitamin B_1.

CASE-RECORDS

CASE 1.—A warrant officer, aged 33, was admitted to hospital on May 19, 1941, complaining of anorexia for the

---

[1] Aalsmeer, W. C. and Wenckebach, K. F. *Wien. Arch. inn. Med.* 1928–29, 16, 193.
[2] Jones, A. M. and Bramwell, C. *Brit. Heart J.* 1939, 1, 187.

3 or 4 days. In all, there were ten 7-day periods on diets in which 40–50% of the calories were derived from white flour, but which were normal in other respects, and thirteen 7 day periods on diets otherwise similar, but in which wheatmeal flour of 92% extraction replaced the white. Some of the subjects did not take part in all the experiments.

Foods, urines and fæces were sampled and ashed as described by McCance and Widdowson (1942), whose paper should be consulted for all further technical details. The iron in the ashed samples of the foods and fæces was estimated by the thioglycollic acid method (McCance, Widdowson and Shackleton 1936). The thiocyanate method (McCance and Shipp, 1933) was used for urines.

Losses of iron in menstruation were determined as follows. The used sanitary towels were burned, with the aid of a little alcohol, in a silica dish. The charred remains were then moistened with water, transferred to a silica crucible and ashed at 450° C. Subsequent treatment of the ash was the same as that employed for foods and fæces. Unused sanitary towels treated in exactly the same way served as controls.

RESULTS

Menstrual Losses.—In two of the subjects taking part in the metabolism experiment the menstrual losses were determined for successive periods throughout a whole year. Subject A menstruated on 12 occasions during this time, subject B, 13 times, subject C was only able to coöperate in this part of the investigation on 8 occasions and subject D not at all. In table I are given the iron losess of subjects A, B and C during successive menstrual periods. Several points are brought out by a study of these figures. First, one individual's losses differed very much from those of another. Barer and Fowler (1936), in their study of 100 women, found an enormous range of variation, from 2 mg. to 110 mg. a month. In the present investigation subject B regularly lost about eight times as much blood as A. C's losses were intermediate. An "average" menstrual loss, therefore, may be little or no guide to the loss of an individual. Each woman must be considered separately so far as her iron requirements and iron metabolism are concerned. Thus, subject A would only have to absorb 0·1 mg. of iron a day to make good her menstrual loss, and no metabolism experiment could be carried out with this degree of accuracy. Subject B, on the other hand, should absorb about 1 mg. of iron a day, the detection of which should be well within the possibilities of a metabolism experiment.

TABLE I—MENSTRUAL IRON LOSSES OF THREE WOMEN IN SUCCESSIVE PERIODS

Subject	Iron losses in mg. per period	Average (mg.)	Absorption required (mg. per day)
A	2·5, 4·4, 3·5, 3·4, 5·7, 4·9, 2·6, 2·3, 1·8, 2·2, 3·8, 2·0 (Total for 1 year, 39·1)	3·6	0·11
B	24·8, 21·5, 31·8, 23·8, 27·3, 30·9, 21·6, 34, 31, 22·6, 34·4, 25·3, 36 (Total for 1 year, 365)	28	1·0
C	8·8, 9·6, 10·4, 13·1, 10·2, 10·8, 11·8, 14·0 (Total for 8 months, 88·2)	11	0·36

Each individual's loss was remarkably constant from one period to another. This does not seem to have been appreciated by previous workers, although their findings show it quite clearly (Barer and Fowler 1936, Leverton and Roberts 1937, Leverton 1941). Barer and Fowler, who studied 13 women on two, three or four occasions, seem more impressed by the variations in the losses of one or two of these women than by the constancy of the others. The stable behaviour of a single individual over long periods, and the equally constant differences between the responses of individuals to the same external conditions should be more widely recognised. The differences in the facility with which two individuals may absorb calcium and magnesium may be quoted as another example (McCance and Widdowson 1942).

Our data suggest that menstrual losses in this country are of the same order as those on the other side of the Atlantic. The losses of all three women studied here fell within Barer and Fowler's range, as did also the menstrual losses of a fourth woman, who did not take part in this metabolism experiment. These were analysed on three successive occasions, and amounted to 9·1, 11·6 and 8·8 mg. of iron respectively.

TABLE II—IRON BALANCES ON WHITE AND BROWN BPEAD DIET

	Subject	Type of bread	No. of days	Intake mg./day	Excretion mg./day	Balance mg./day	Absorption as % of intake
WOMEN	A	White	63	16·7	14·4	+2·3	13·8
	B	,,	70	14·4	12·5	+1·9	13·2
	C	,,	49	14·7	12·8	+1·9	12·9
	D	,,	42	11·7	10·7	+1·0	8·6
	Mean			14·4	12·6	+1·8	12·5
	A	Brown	84	23·4	22·6	+0·8	3·4
	B	,,	63	19·7	20·1	−0·4	−2·0
	C	,,	91	23·6	22·6	+1·0	4·2
	D	,,	42	17·8	18·1	−0·3	−1·7
	Mean	,,		21·1	20·9	+0·2	1·0
MEN	E	White	63	18·5	17·8	+0·7	3·8
	F	,,	63	16·3	14·9	+1·4	8·6
	G	,,	49	21·5	21·0	+0·5	2·3
	H	,,	56	20·0	17·2	+2·8	14·0
	Mean	,,		19·1	17·7	+1·4	7·3
	E	Brown	84	30·8	30·3	+0·5	1·6
	F	,,	77	23·5	22·9	+0·6	2·5
	G	,,	70	30·5	30·5	±0	0
	H	,,	42	26·9	26·7	+0·2	0·7
	Mean	,,		27·9	27·6	+0·3	1·1

Metabolic Studies.—Table II shows the average daily iron intakes and excretions of four men and four women on white and brown bread diets, together with the length of time each person was studied. Representative samples of each person's urine were analysed and found to contain only 0·03–0·06 mg. iron per day on either type of diet, so these results are not given separately but are included in the excretion figures. The white flour used in these experiments contained 1·41 mg. iron per 100 g., the brown flour 3·55 mg. Hence the iron intakes on the brown bread diets were considerably higher than they were on the white, but even the intakes on the white bread diets were fairly high.

It will be seen that on the brown bread diets both men and women were, within the limits of experimental error, in iron equilibrium. Two of the women were in slight positive iron balance, but subject B, who should have been absorbing 1 mg. a day (vide supra) did not appear to be retaining any. She was in positive balance during 4 of the weeks and in negative balance during the remaining 5 of this part of the study. On the white bread diets all eight of the subjects were in positive iron balance. The women absorbed more iron than three of the men, but on the white bread diet subject H consistently absorbed more iron than any of the other individuals. Hence, too much significance should not be attached to differences between the averaged results for the two sexes, although they become more obvious when the absorption is expressed as a percentage of the intake.

Effect of Calcium on Iron Absorption.—There seems to be some difference of opinion as to whether calcium has any effect on iron assimilation, and if so whether it promotes or inhibits it. Thus Sherman (1907), Orten and others (1936) and Day and Stein (1938) considered that additional calcium tended to promote iron utilisation. Kletzien (1940), on the other hand, found that the addition of calcium salts to the diet of anæmic rats interfered with their ability to absorb iron. The results shown in table II were obtained by averaging the results of metabolic periods, in some of which the bread contained added calcium salts. The actual amount of calcium added (0·01% of the total dry food) was very small when compared with the amounts that Kletzien added to his rats' diets (1–3% as calcium carbonate), but in the light of these findings it was thought wise to see whether the added calcium was affecting the iron balances. Accordingly, the results of seven of the subjects, whose metabolism was studied for a sufficiently long time, were subdivided into periods when the bread was and was not through nasal catheters[2] The figures also show that the alveolar oxygen concentration attained at a given rate of oxygen flow tends to vary inversely as the subject's vital capacity (and presumably as his pulmonary ventilation) This indicates the need for higher rates of oxygen flow in larger patients, a principle which no doubt also applies to the administration of oxygen through nasal catheters

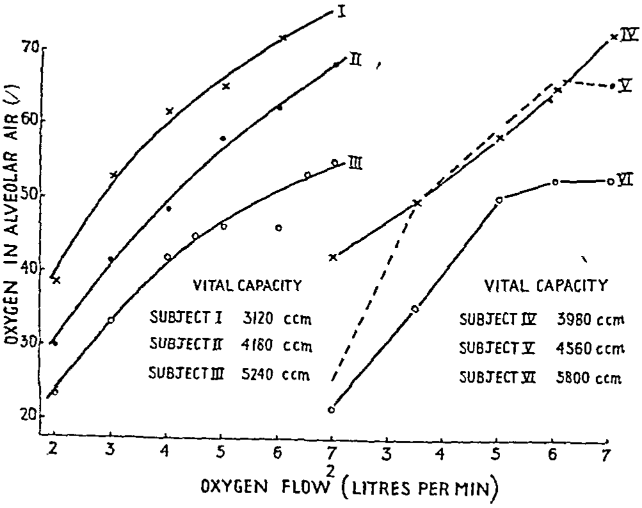


FIG 2—Alveolar concentrations of oxygen obtained with different rates of flow

The CO_2 figures indicate in some cases a slight degree of rebreathing, which is probably an advantage

We have used this mask for over a year in a medical ward It is the most comfortable and least disturbing apparatus that we know for the administration of oxygen, not excepting the BLB mask Its one disadvantage is that it has to be temporarily removed to allow of expectoration, vomiting or feeding Its efficiency seems to be greater than that of most other forms of apparatus, but obviously less than that of the BLB It may be used for the administration of 5% or 7% CO_2 in oxygen to patients suffering from carbon-monoxide poisoning It is being recommended by the Department of Health for Scotland for use in hospitals and mobile oxygen units as a supplement to the supply of BLB masks available for treatment of gas casualties

PERCENTAGES OF CARBON DIOXIDE AND OXYGEN IN ALVEOLAR AIR AFTER ADMINISTRATION OF OXYGEN FOR 5 MIN THROUGH ROSE AND SELLORS IMPROVISED MASK AT VARYING RATES OF FLOW

Subject	Vital capacity c cm	Rate of flow of oxygen (l per min)								
		2	3	3 5	4	4 5	5	6	6 5	7
1	3120	6 3	5 9*		6 2*		5 9*	5 8*		5 8
		38 5	*52 9**		*61 8**		*65 3**	*72 1**		*76 6*
2	4180	5 9	5 9*		6 1*		6 1*	5 8*		5 8
		29 9	*41 4**		*48 8**		*58 3**	*62 5**		*68 4*
3	5240	5 9	6		6 2*	6 4*	6*	6 3*	6*	5 9*
		23 5	*33 2*		*42 1**	*44 9**	*46 3**	*46 2**	*53 4**	*55 2**
4	3980	6 7		6 3			6 3	6 3		6
		42 2		*50 1*			*59*	*65 4*		*73 1*
5	4560	7 2		7 1			7	7 3		6 3
		24 7		*49 9*			*60 1*	*66 9*		*66 2*
6	5800	7 1		6 9			7	7		5 1
		21 6		*38*			*50 3*	*53 1*		*53 3*

Values marked * are means of two samples, one taken at the end of inspiration, the other at the end of expiration, values not so marked are from samples taken at the end of expiration, CO_2 values are given in Roman type and O_2 in italics

---

[2] Christie, R V *Ibid*, 1938, ii, 876

ROYAL MEDICAL BENEVOLENT FUND —The annual meeting will be held at 4 P M on Thursday, May 21, at 10, Wimpole Street, London, W 1 The fund has received £280 as a residual legacy from the estate of Dr J J Thomarson of Bournemouth

---

IRON EXCHANGES OF ADULTS ON WHITE AND BROWN BREAD DIETS

E M. WIDDOWSON
B SC, PH D LOND

R A MCCANCE
M D CAMB, F R C P

(*Department of Medicine, Cambridge*)

IN an experimental study of rationing carried out during the first six months of this war, we (1940) obtained some evidence that calcium was badly absorbed from a diet containing much brown bread We then set out to explore the effects of flours of high extraction on the mineral metabolism of man A full account of the way in which the experiments were arranged and the data on calcium, magnesium and phosphorus are being published elsewhere (McCance and Widdowson 1942)

Before setting out the results of the iron studies, there are certain aspects of the metabolism of this element which must be made clear Cereals contain appreciable amounts of iron—white flour about 1 4 mg per 100 g and flour of 92% extraction about 3 5 mg per 100 g—and, on the basis of work which will be discussed later, this iron is generally regarded as being freely available for absorption Brown bread in fact is often advised as a valuable source of iron and white bread contrasted unfavourably with it in this respect

In 1937 (a, b) we put forward a new conception of the way in which the amount of iron in the body was regulated Our theory, which has formed a valuable working hypothesis, and has been confirmed by ourselves (Widdowson and McCance 1937, McCance and Widdowson 1938) and accepted by others (Hahn et al 1939, Maddock and Heath 1939) postulated that the iron taken up from the gut depends mainly on the amount of iron in the plasma or in the body and the amount of iron in the diet Absorption is promoted by a decrease in the former or an increase in the latter, or both We further postulated that the quantities of iron excreted into the gut are much less than have usually been supposed They may in fact be negligible, and should be regarded (like the urinary iron) as playing a very minor part in the total iron metabolism of the body It follows from this that negative iron balances should never be obtained except at extraordinarily low intakes Leverton's (1941) results support this view

Barer and Fowler (1936), in a study of 100 normal women, showed that most lost between 10 and 25 mg of iron a month with their menstrual discharges, and these figures are of the same order as those which have been found by others (Ohlson and Daum 1935, Farrar and Goldhamer 1935, Leverton and Roberts 1937, Leverton 1941), and which will be discussed later Apart, therefore, from any theoretical consideration, common sense tells us that healthy women should absorb daily something like 0 5 mg—i e, the iron in their food should exceed the iron in their fæces by this amount Men should not absorb so much as this, or not at any rate for more than short periods, and hence their daily absorptions over a long span of time ought to be of a much lower order Yet there is no consistent evidence from the small number of metabolism experiments which have so far been carried out that women do tend to absorb as much as 0 5 mg of iron per day, or for that matter that they absorb any more than men (Ohlson and Daum 1935, Farrar and Goldhamer 1935, Widdowson and McCance 1937, McCance and Widdowson 1938) Only the few women studied by Leverton and Roberts (1937) and by Leverton (1941) can be regarded as showing absorptions in conformity with their physiological requirements, and unfortunately they were not compared with men under the same conditions The iron intakes during all these studies have ranged from 3 1 to 13 6 mg per day, so that the higher ones should have provided the subjects with enough iron for their needs, and Leverton's (1941) women did absorb the metal freely when they were given 7 8 mg per day

SUBJECTS AND METHODS

Four men and four women have taken part in these experiments They were described by McCance and Widdowson (1942) The analytical periods were 7 days in length, and 3 or 4 consecutive weeks on each type of diet were employed, preceded by a preliminary period of

Medical Societies

ROYAL SOCIETY OF MEDICINE

At a meeting of the section of Neurology held at the Wingfield-Morris Orthopædic Hospital, Oxford, on April 18 with Brigadier **George Riddoch** in the chair, a discussion on

Peripheral Nerve Injuries

was opened by Prof H J **Seddon**, who outlined a clinico-pathological classification that had been found of value in the work being carried out at the Oxford Nerve Injuries Centre He pointed out that since Weir Mitchell gave the first accurate description of irritative nerve lesions seen during the American Civil War the incidence of such conditions has almost certainly fallen Lesions seen during the present war, many of them due to injuries in no way different from those encountered in civilian life, are almost all of the paralytic variety—that is to say, damage to the nerve is manifested by loss of function rather than by perversion of function The classification he described takes no account of irritative lesions except in so far as they are accompanied by paralytic phenomena Changes following division of a nerve are so well known as to require little elaboration, operative repair is always required and except in the case of the radial nerve functional recovery is usually imperfect A lesion in continuity can be produced by any injury that does not cause actual disruption of the nerve—a near miss, traction or compression It can be produced experimentally by crushing the nerve with forceps, and however produced there is always complete peripheral degeneration. But spontaneous recovery is almost invariable, and the quality of recovery excellent: experimental evidence shows that the characteristic feature of a lesion in continuity is the preservation of more or less of the supporting structure of the nerve which not only prevents retraction of the broken axons but ensures that subsequent regeneration will proceed along the correct anatomical channels J Z Young has observed that the absolute rate of regeneration after a lesion in continuity is invariably greater than the rate after division and immediate suture of a nerve Although sufficient clinical evidence has not yet accumulated Professor Seddon was inclined to think that the same is true in man The third type of lesion transient block, is much less serious Again the paralysis can be produced by a near miss, by compression or traction Clinically, paralysis is always found to be more marked on the motor side, but the reaction of degeneration is never found in the affected muscles and recovery occurs with great rapidity There is nothing to suggest any degenerative change in the axons peripheral to the lesion At present there is no hint of the exact pathology of the condition

Mr W B **Highet** described the various types of dissociated paralysis found after a partial nerve lesion—i e, partial division, an incomplete lesion in continuity, and transient block, the last being invariably a dissociated form of paralysis It is not always easy to distinguish between complete and incomplete lesions If one fails to recognise such anomalies as double innervation (for example of the thenar muscles) and the early shrinkage of the area of sensory loss due to overlap by neighbouring normal nerves, a complete lesion may be regarded as incomplete and treated conservatively when the correct treatment is exploration and repair An essential diagnostic measure is procaine blocking of the injured nerve or of one of its neighbours, by this means all anomalies can be readily recognised and true sensory regeneration can be distinguished from shrinkage by overlap Division of isolated nerve branches should be distinguished from incomplete lesions of the main nerve trunk, especially in the case of the posterior interosseous and lateral popliteal nerves The type of dissociation in incomplete lesions depends on the anatomy of the intraneural plexus at the level of the lesions At certain well-known sites there is an aggregation into a discrete bundle or funiculus of the nerve-fibres destined to leave the main nerve trunk as a branch or series of branches If a nerve is partially divided at a point just proximal to the origin of branches a funicular type of dissociated paralysis is found, the distribution of the paralysis corresponding exactly with the part of the nerve that has been damaged If however the injury occurs a considerable distance proximal to the origin of branches and where the intraneural topography is complex a non-funicular dissociation results In this type of lesion there is a more or less generalised depression of function in the nerve but all nerve-fibres are not equally vulnerable There is often a selective effect on nerve-fibres of different types The large fibres—motor and proprioceptive—almost always prove more vulnerable than the smaller fibres subserving the various forms of cutaneous sensation and the least vulnerable of all are the smallest fibres subserving sweating and slow pain Transient block is a good example of this modal dissociation, but Mr Highet gave examples of this type of dissociation in which the larger motor fibres had undergone complete degeneration whereas the smaller fibres remained intact

Dr **Graham Weddell** gave an account of the anatomical investigation of cutaneous sensibility With dilute methylene-blue it is possible to stain the finest nerve-fibres and their endings in the living skin After removal of the specimen fibres can be traced over great distances and their final distribution determined with great accuracy It has been found that the various sensory end-organs lie at different levels beneath the surface of the skin, and that each sensory spot receives more than one fibre from the cutaneous plexus Recently this work has been extended to cover the changes occurring during degeneration and regeneration of cutaneous nerves The painstaking clinical observations of Trotter and Davis have been confirmed, the early shrinkage of the sensory area has been explained by the ingrowth of fibres from neighbouring normal nerves, and no evidence has been found to support Head's theory of two separate forms of sensibility, protopathic and epicritic During the process of regeneration the new fibres grow most rapidly in the part of the skin immediately adjoining a normally innervated area, so that reinnervation is, in general, seen first at the periphery In the early days the sensory end-organs receive less than their proper complement of fibres and during this period clinical observation shows that sensibility is imperfect It seems likely that the early and late forms of sensory recovery described by Head and Rivers can be explained on this basis

Dr **Ludwig Guttmann** discussed recovery of sweating in relation to pain and touch In analysing the course of functional recovery of sweat glands three stages can be distinguished (1) restitution of sweating in the intermediate zone of an interrupted nerve by overlap from the adjacent nerves, (2) functional recovery of sweat glands in the autonomous zone of the interrupted nerve due to true regeneration, and (3) functional reorganisation of sweat glands after complete recovery In none of the cases of traumatic lesion has this final stage been evident and sensibility has likewise remained impaired In general, recovery of deep cutaneous pain precedes the return of sweating, superficial cutaneous pain and coarse touch As a rule sweating and pain

---

References (continued from previous page)

McCance R A and Widdowson E M (1937a) *Quart J Med* 6 5 (1937b) *Lancet* ii 680, (1938) *J Physiol* 94 148 (1940) *Spec Rep Ser med Res Coun Lond* (publication delayed) (1942) *J Physiol* (in press) and Shackleton L R B (1936) *Spec Rep Ser med Res Coun Lond* No 213

Maddock S and Heath C W (1939) *Arch intern Med* 63, 584

Ohlson M A and Daum K (1935) *J Nutrit* 9 75

Oldham H Schultz F W and Morse, M (1937), *Amer J Dis Child* 54, 252

Orten J M, Smith A H and Mendel, L B (1936) *Ibid*, 12 373

Patwardhan V N (1937) *Biochem J* 31 560

Rehm P and Winters J C (1940) *J Nutrit* 19 213

Robscheit Robbins F S (1929) *Physiol Rev* 9 666

Rose M S and Kung L (1932) *J biol Chem* 98, 417

— and Vahlteich E M (1932) *Ibid* 96 593

— — and MacLeod G (1934) *Ibid* 104 217

Ross J R and Summerfeldt P (1935) *Amer J Dis Child* 49 1185 (1936) *Canad med Ass J* 34 155

Shackleton L and McCance R A (1936) *Biochem J* 30 582

Sherman H C (1907) *Dep Bull exp Sta U S Dept Agric* No 185

Summerfeldt P Tisdall F F and Brown A (1932) *Canad med Ass J* 26 666

Vahlteich E M Funnell, E H MacLeod G and Rose M S (1935) *J Amer diet Ass* 11, 331

Whipple G H and Robscheit-Robbins F S (1925) *Amer J Physiol* 72 395

Widdowson E M and McCance, R A (1937) *Biochem J* 31, 2029

reinforced with calcium, and the results are shown in table III It will be seen that the addition of calcium certainly did not interfere with iron absorption If anything it appeared to facilitate it, but the differences are too small to warrant the drawing of any conclusions

TABLE III—AVERAGED IRON BALANCES AT DIFFERENT LEVELS OF CALCIUM INTAKE

	Type of bread	Average length of study (days)	Intake	Excretion	Balance or absorption
			(mg /day)		
WOMEN	White	33	14 2	12 3	+ 1 9
	White + calcium	28	16 3	14 0	+ 2 3
	Brown	37	21 8	21 4	+ 0 4
	Brown + calcium	42	22 6	21 8	+ 0 8
MEN	White	30	18 8	17 5	+ 1 3
	White + calcium	28	19 6	17 8	+ 1 8
	Brown	29	26 6	26 2	+ 0 4
	Brown + calcium	39	29 2	28 7	+ 0 5

BROWN BREAD AS A SOURCE OF IRON

The finding which seems to demand discussion is that the men and women, each and all, absorbed more iron from white bread than from brown They did this in spite of the fact that the intakes were 50% higher in the brown bread experiments This difference in absorption cannot have been due to changes in the diet other than bread, for there were almost none, and 3 or 4 weeks on white bread alternated with 3 or 4 weeks on brown throughout the 9 months of the experiment The explanation cannot be that the iron in the whole wheat is present as an unavailable hæmatin compound, for the proportion of the iron present in inorganic form, as determined by the αα′ dipyridyl method, is high (Shackleton and McCance 1936, McCance 1939) It may partly be explained by the indigestible nature of the branny particles in the brown bread and by its laxative action Even soluble metals such as lithium (Kent and McCance 1941) and potassium (McCance and Widdowson 1942) are less completely absorbed from brown than from white bread diets In this dilemma, one's mind naturally turns to phytic acid, which is present in large amounts in brown bread, and which has already been shown to depress the absorption of dietary calcium and magnesium by precipitating these metals in the gut The ferric salt of phytic acid is even more insoluble under certain conditions than the calcium and magnesium salts, and, in fact, ferric chloride is a reagent commonly used for the precipitation of phytic acid in the chemical estimation of this compound Apart from phytic acid, moreover, brown bread diets contain more inorganic phosphate than do white, and ferric phosphate is a compound which must be insoluble at the pH of the intestine A number of workers (Cox et al 1931, Brock and Diamond 1934, Rehm and Winters 1940) have produced a lowering of the blood phosphorus and rickets in rats by incorporating large amounts of iron salts in their food If an excess of iron will precipitate phosphate in the intestine and render it unavailable, may not the converse be true, and an excess of phosphate precipitate the iron ? (Day and Stein 1938)

The iron in whole cereals appears to be effective in curing nutritional anæmia in the rat (Rose and Vahlteich 1932, Rose and Kung 1932, Rose, Vahlteich and MacLeod 1934, Free and Bing 1940), and the addition of sodium phytate to the diet of anæmic rats does not seem to inhibit hæmoglobin regeneration to any great extent (Harrison 1942) The intestine of the rat, however, secretes a phytase (Patwardhan 1937), and rats can absorb phosphate more readily than some other animals, so great caution is necessary in applying the results of these experiments to man

Whipple and Robscheit-Robbins (1925) and Robscheit-Robbins (1929) found that " bread " promoted hæmoglobin regeneration in anæmic dogs less well than any other food or mixture of foods which they investigated This bread was made from a mixture of ordinary bread flour (presumably white) and bran, in the ratio of 6 1, together with potato starch, sugar, canned tomatoes and cod-liver oil A mixture of white flour and bran in this proportion would approximate in chemical composition to the 92% extraction flour used in the present experiments

Experimental evidence as to whether whole cereals promote or inhibit the absorption of iron in humans is very meagre Summerfeldt, Tisdall and Brown (1932) and Ross and Summerfeldt (1935, 1936) have fed a group of children on a special cereal mixture of their own and compared their hæmoglobins with those of a control group to which ordinary cereal such as oatmeal was given Since their special cereal contained twelve times as much iron as the oatmeal, there is little wonder that the response was better on the special food

Vahlteich and others (1935) carried out a balance experiment on two women, in which they set out to compare egg yolk and bran as sources of iron Unfortunately, their experimental periods were too short (7–9 days in all) and their preliminary period quite inadequate (1 day) for their results to have much meaning Taking the results for what they are worth, both subjects were in slight negative iron balance on both types of diet

Evidence that cereals may not be a good source of iron comes from the careful study of a baby boy, who was metabolised continuously for 10 months (Oldham, Schultz and Morse 1937) He retained iron satisfactorily when his basal diet was supplemented with spinach, peas, meat or an iron salt He absorbed no iron, however, when the supplement was 'Vio-Bin,' a wheat-germ preparation, even though this contributed as much iron as the other supplements, and 92% of it reacted with αα′ dipyridyl

Brown bread is always confidently recommended as a good source of iron, but there seem to be various reasons why this opinion should be revised Chemically there is much to be said against it Previous experimental work on dogs and humans has been, to say the least of it, unconvincing The present results suggest that brown bread is a poor source of iron The level balances on brown bread are not so obviously damning as they would have been if negative balances had been obtained, but our theory of the way in which iron is absorbed and excreted explains why negative balances were not obtained and should not have been expected, even if phytic acid seriously interfered with the absorption of iron It is suggested, therefore, that brown bread as a source of iron requires further investigation Children's retentions of iron on white and brown bread diets might usefully be compared, but long periods of investigation would be essential if the evidence to be obtained is to be of real value Meanwhile it might be wiser not to lay too much stress on brown bread as a food rich in iron

SUMMARY

The iron balances of four men and four women were studied over a period of 9 months to a year

The menstrual losses of three women were characteristically different one from another but very constant for any one woman from month to month

Iron was absorbed from diets in which white flour constituted 40–50% of the total calories

Iron was not absorbed from similar diets when the white flour was replaced by one of 92% extraction

It is suggested that, in spite of the large amounts of iron in whole wheat, bread made from it may not be as good a source of iron as is generally supposed

We are indebted to the subjects for their collaboration in these long and exacting experiments The expenses were largely defrayed by the Medical Research Council, and E M W is in the wholetime service of the Council

REFERENCES

Baier A P, Fowler, W M (1936) *Amer J Obstet Gynec* 31, 979
Brock J F and Diamond, L K (1934) *J Pediat* 4, 442
Cox, G J Dodds, M L, Wigman, H B and Murphy F J (1931) *J biol Chem* 92, 11
Day, H G and Stein H J (1938) *J Nutrit* 16, 525
Farrar G E and Goldhamer S M (1935) *Ibid* 10 241
Free, A H and Bing F C (1940) *Ibid*, 19, 449
Hahn P F, Bale, W F Hettig R A, Kamen M D and Whipple, G H (1939) *J exp Med* 70 443
Harrison, D C In the press See *Lancet*, 1942, i, 595
Kent, N L and McCance R A (1941) *Biochem J* 35, 837
Kletzien, S W (1940) *J Nutrit* 19 187
Leverton R M (1941) *Ibid* 21, 617
— and Roberts L J (1937) *Ibid*, 13 65
McCance R A (1939) *Chem and Ind* 58 528
— and Shipp, H L (1933) *Spec Rep Ser med Res Coun, Lond* No 187

Continued at foot of opposite page

Medical Societies

ROYAL SOCIETY OF MEDICINE

AT a meeting of the section of Neurology held at the Wingfield-Morris Orthopædic Hospital, Oxford, on April 18, with Brigadier GEORGE RIDDOCH in the chair, a discussion on

Peripheral Nerve Injuries

was opened by Prof H J SEDDON, who outlined a clinico-pathological classification that had been found of value in the work being carried out at the Oxford Nerve Injuries Centre He pointed out that since Weir Mitchell gave the first accurate description of irritative nerve lesions seen during the American Civil War the incidence of such conditions has almost certainly fallen Lesions seen during the present war, many of them due to injuries in no way different from those encountered in civilian life, are almost all of the paralytic variety—that is to say, damage to the nerve is manifested by loss of function rather than by perversion of function The classification he described takes no account of irritative lesions except in so far as they are accompanied by paralytic phenomena Changes following division of a nerve are so well known as to require little elaboration, operative repair is always required and except in the case of the radial nerve functional recovery is usually imperfect A lesion in continuity can be produced by any injury that does not cause actual disruption of the nerve—a near miss, traction or compression It can be produced experimentally by crushing the nerve with forceps, and however produced there is always complete peripheral degeneration But spontaneous recovery is almost invariable, and the quality of recovery excellent experimental evidence shows that the characteristic feature of a lesion in continuity is the preservation of more or less of the supporting structure of the nerve which not only prevents retraction of the broken axons but ensures that subsequent regeneration will proceed along the correct anatomical channels J Z Young has observed that the absolute rate of regeneration after a lesion in continuity is invariably greater than the rate after division and immediate suture of a nerve Although sufficient clinical evidence has not yet accumulated Professor Seddon was inclined to think that the same is true in man The third type of lesion, transient block, is much less serious Again the paralysis can be produced by a near miss, by compression or traction Clinically, paralysis is always found to be more marked on the motor side, but the reaction of degeneration is never found in the affected muscles and recovery occurs with great rapidity There is nothing to suggest any degenerative change in the axons peripheral to the lesion At present there is no hint of the exact pathology of the condition

Mr W B HIGHET described the various types of dissociated paralysis found after a partial nerve lesion—i e, partial division, an incomplete lesion in continuity, and transient block, the last being invariably a dissociated form of paralysis It is not always easy to distinguish between complete and incomplete lesions If one fails to recognise such anomalies as double innervation (for example of the thenar muscles), and the early shrinkage of the area of sensory loss due to overlap by neighbouring normal nerves, a complete lesion may be regarded as incomplete and treated conservatively when the correct treatment is exploration and repair An essential diagnostic measure is procaine blocking of the injured nerve or of one of its neighbours, by this means all anomalies can be readily recognised and true sensory regeneration can be distinguished from shrinkage by overlap Division of isolated nerve branches should be distinguished from incomplete lesions of the main nerve trunk, especially in the case of the posterior interosseous and lateral popliteal nerves The type of dissociation in incomplete lesions depends on the anatomy of the intraneural plexus at the level of the lesions At certain well-known sites there is an aggregation into a discrete bundle or funiculus of the nerve-fibres destined to leave the main nerve trunk as a branch or series of branches If a nerve is partially divided at a point just proximal to the origin of branches a funicular type of dissociated paralysis is found, the distribution of the paralysis corresponding exactly with the part of the nerve that has been damaged If however the injury occurs a considerable distance proximal to the origin of branches and where the intraneural topography is complex a non-funicular dissociation results In this type of lesion there is a more or less generalised depression of function in the nerve but all nerve-fibres are not equally vulnerable There is often a selective effect on nerve-fibres of different types The large fibres—motor and proprioceptive—almost always prove more vulnerable than the smaller fibres subserving the various forms of cutaneous sensation and the least vulnerable of all are the smallest fibres subserving sweating and slow pain Transient block is a good example of this modal dissociation, but Mr Highet gave examples of this type of dissociation in which the larger motor fibres had undergone complete degeneration whereas the smaller fibres remained intact

Dr GRAHAM WEDDELL gave an account of the anatomical investigation of cutaneous sensibility With dilute methylene-blue it is possible to stain the finest nerve-fibres and their endings in the living skin After removal of the specimen fibres can be traced over great distances and their final distribution determined with great accuracy It has been found that the various sensory end-organs lie at different levels beneath the surface of the skin, and that each sensory spot receives more than one fibre from the cutaneous plexus Recently this work has been extended to cover the changes occurring during degeneration and regeneration of cutaneous nerves The painstaking clinical observations of Trotter and Davis have been confirmed, the early shrinkage of the sensory area has been explained by the ingrowth of fibres from neighbouring normal nerves, and no evidence has been found to support Head's theory of two separate forms of sensibility, protopathic and epicritic During the process of regeneration the new fibres grow most rapidly in the part of the skin immediately adjoining a normally innervated area, so that reinnervation is, in general, seen first at the periphery In the early days the sensory end-organs receive less than their proper complement of fibres and during this period clinical observation shows that sensibility is imperfect It seems likely that the early and late forms of sensory recovery described by Head and Rivers can be explained on this basis

Dr LUDWIG GUTTMANN discussed recovery of sweating in relation to pain and touch In analysing the course of functional recovery of sweat glands three stages can be distinguished (1) restitution of sweating in the intermediate zone of an interrupted nerve by overlap from the adjacent nerves, (2) functional recovery of sweat glands in the autonomous zone of the interrupted nerve due to true regeneration, and (3) functional reorganisation of sweat glands after complete recovery In none of the cases of traumatic lesion has this final stage been evident, and sensibility has likewise remained impaired In general, recovery of deep cutaneous pain precedes the return of sweating, superficial cutaneous pain and coarse touch As a rule sweating and pain

---

References (continued from previous page)

McCance R A and Widdowson E M (1937a) *Quart J Med* 6, 5 (1937b) *Lancet*, ii 680 (1938) *J Physiol* 94 148, (1940) *Spec Rep Ser med Res Coun Lond* (publication delayed) (1942) *J Physiol* (in press), and Shackleton L R B (1936) *Spec Rep Ser med Res Coun Lond* No 213
Maddock S and Heath, C W (1939) *Arch intern Med* 63 584
Ohlson M A and Daum, K (1935) *J Nutrit* 9 75
Oldham H Schultz F W. and Morse, M (1937) *Amer J Dis Child* 54, 252
Orten J M, Smith A H and Mendel L B (1936) *Ibid* 12, 373
Patwardhan V N (1937) *Biochem J* 31 560
Rehm P and Winters J C (1940) *J Nutrit* 19 213
Pobscheit Robbins F S (1929) *Physiol Rev* 9 666
Rose, M S and Kung, L (1932) *J biol Chem* 98, 417
— and Vahlteich E M (1932) *Ibid* 96 593
— — and MacLeod G (1934) *Ibid* 104 217
Ross J R and Summerfeldt P (1935) *Amer J Dis Child* 49, 1185 (1936) *Canad med Ass J* 34 155
Shackleton L and McCance R A (1936) *Biochem J* 30 582
Sherman H C (1907) *Dep Bull exp Sta U S Dept Agric* No 185
Summerfeldt P Tisdall, F F and Brown A (1932) *Canad med Ass J* 26 666
Vahlteich E M Funnell, E H, MacLeod, G and Rose, M S (1935) *J Amer diet Ass* 11, 331
Whipple G H and Robscheit-Robbins F S (1925) *Amer J Physiol* 72 395
Widdowson E M and McCance, R A (1937) *Biochem J* 31, 2029

sensibility to superficial or medium pin-prick stimuli recover together, followed more or less closely by coarse touch Recovery of normal touch is always long delayed—it may never return after nerve suture following gunshot injuries—although sweating and coarse touch have returned long ago In certain cases where regeneration is delayed (e g, late suture) sweating fails to return in spite of good sensory recovery, this may be explained by irreversible atrophy of the sweat glands From the practical point of view investigation of sudomotor changes is of value in being a purely objective check on sensory examination

Reviews of Books

Anæsthetics Afloat

Surgeon Lieut Commander RONALD WOOLMER, B M Oxfd, D A, R N V R, anæsthetic specialist, R N medical service, late senior resident anæsthetist, St Thomas's Hospital London H K Lewis Pp 120 *6s*

THIS is a simple practical manual written for the inexperienced anæsthetist afloat, and makes no pretence at being anything more ambitious Writing of intravenous anæsthesia, the author gives a glimpse of the maritime lot in this encouraging sentence "When negotiating a ladder or a hatchway the syringe can quite well be carried in the mouth" Further evidence that the Navy is equal to anything is to be found in a paragraph on the choice of anæsthetic for ruptured ectopic gestation The book is written by a teacher of experience and includes many valuable tips, but it is marred by the proposal that 2 c cm of 1 1000 adrenaline should be given intravenously for an ill-defined anæsthetic difficulty, and that adrenaline (dose not stated) should be injected into the heart muscle for the treatment of ether convulsions These pieces of advice might well result in the cardiac emergency, later described, in which "the heart stops abruptly between two beats" The suggestion that a patient suffering from ether convulsions should be placed in the Trendelenburg position is not likely to commend itself to the experienced anæsthetist The section dealing with postoperative pulmonary complications is excellent and follows Brock's teaching closely, but the chapter on local anæsthesia is mediocre and does not ring of practical experience, the naval rating is indeed hardy if he submits to circumcision under 20–25 c cm of ½% novocain injected as described

Body Mechanics

In Health and Disease (3rd ed) JOEL E GOLDTHWAIT, M D LLOYD T BROWN, M D, LORING T SWAIM, M D, JOHN G KUHNS, M D, WILLIAM J KERR, M D London J B Lippincott and Co Pp 386 *30s*

IN this new edition much has been rewritten and greater emphasis is laid on the prevention of postural deformities and of chronic disease Dr Goldthwait and his colleagues combine the attitudes of osteopath and orthopædic surgeon, their work is known almost as well here as in America, though we have never favoured their conception that body mechanics influence such diseases as diabetes, cardiac angina, muscular atrophy They regard postural training as a prophylactic measure in childhood and in adults as an aid to recovery, especially in chronic disease Many of the deformities in children illustrated in the book, however, are obviously rachitic It is putting the cart before the horse to speak of body mechanics in relation to a nutritional disease bound by its nature to cause deformity Dr Goldthwait holds that postural training should be the aim of physical recreation and activity in schools The difficulties inherent in the upright position seem to be overcome by naturally living native races Poor postural physique is the outcome, not so much of the upright position as of the sedentary and overcivilised lives that most of us live Children in the growing years should therefore be safeguarded against the drawbacks of malnutrition and indoor, sedentary classwork We recognise as much, but the book may stimulate school medical officers to take a greater interest in postural training The Central Council for Recreative Physical Training is helping to maintain postural training in clubs and industry among young adults According to Dr Goldthwait such efforts will in the long run prevent a deal of minor disability, injury and disease

Handbook of Hygiene

(2nd ed) JOSEPH W BIGGER, M D, Sc D Dubl, F R C P I, D P H London Bailliere, Tindall and Cox Pp 414 *12s 6d*

THIS useful book deals clearly with those aspects of hygiene which concern the general practitioner, without going into details of sanitary law which affect the medical officer of health The information is accurate on the whole, but there are one or two omissions, for example, there is no reference to the increased incidence of tuberculosis since the outbreak of war, or to the fact that stillbirths are now registrable in Scotland, and the list of industrial diseases notifiable to the *inspector of factories* could be brought up to date Dr Bigger holds that only two qualities of milk should be sold *raw milk, from* healthy tuberculin-negative cows, produced under properly controlled and inspected conditions and containing not more than 20,000 bacteria per c cm and no coli forms in 1 c cm, and milk produced from cows living under reasonably clean conditions and judged healthy on veterinary examination—this milk to be pasteurised The closing chapter on the relation of the general practitioner to the public health service has been contributed by Dr C J McSweeney The book marks an advance towards the proper teaching of public health to undergraduates, who have too long been invited merely to consider drains

Year Book of the Eye, Ear, Nose and Throat, 1941

Editors LOUIS BOTHMAN, M D, SAMUEL J CROWE, M D Chicago Year Book Publishers, London H K Lewis Pp 648 *16s 6d*

A RECURRENT new year pleasure is the receipt of this small American book This year, as usual, the published work has been thoroughly combed, and is displayed agreeably as well as critically The first section summarises recent work on ophthalmology, giving a good account of medical and surgical methods The research student and the clinician will find it informative about rare conditions, a special article has been written on clinical manifestations of allergy in ophthalmological cases The special article on aviation medicine relating to the ear, nose and throat is outstandingly good, showing as it does how much research on the subject is being carried out all over the world In America the Aviation School of Medicine is fully engaged in the investigation of flying problems, and has apparently been busy on them for over twenty years, yet we heard relatively little of this branch of otolaryngology in the years before the war Two big problems are the effects of noise on hearing, and of changes of pressure on the middle ear and sinuses, and all the work done on them, to date, is reviewed Coming down to earth, much of the prewar work on the surgery of otosclerosis is now ripe for scrutiny Claims of success in treatment have been over-optimistic and under-critical Fenestration of the labyrinth capsule can relieve the condition, but the technical difficulty of regularly achieving a permanent opening has yet to be solved Meniere's syndrome is being treated at the Mayo Clinic by intravenous histamine on the theory that capillary permeability in the end-organ is the causative factor On the other hand, Dandy is convinced that the end-organ is not the seat of the trouble, and advises section of the nerve, stating that he obtains permanent cures in nearly every case, his operative record of 1 death in 401 operations is impressive A review of papers covering chemotherapy in its clinical aspects is given, together with an advance note on gramicidin, this bacteriostatic agent, crystallised from an anaerobic sporulating soil bacillus, is an interesting foretaste of things to come A swing back towards surgery is noticeable in the treatment of carcinoma of the larynx, but this may be fallacious, since none of the papers reviewed is by a radiotherapist A new type of broncho-œsophagoscope is described, which permits alterations in length and lumen of the tubes, with alternative use of proximal and distal illumination, and enables the smaller bronchi to be inspected The book is packed with good stuff

THE LANCET

LONDON SATURDAY, MAY 16, 1942

EQUIVALENT OR MAKESHIFT?

The German word *ersatz* (substitute) has come down in the hierarchy of words it used to mean equivalent and now, owing to the damnable necessity of war, it means makeshift The Franco-German war of 1870 gave birth to margarine, the war of 1914–18 familiarised us with a whole scale of substitutes and the present war has brought on the market dozens of catchpenny and other makeshifts—mainly, as yet, for foods Now to the dietitian and the gourmet not to speak of the allergic, there are no such things as food substitutes Citric acid, sugar and a greenery-yallery aniline dye do not synthesise lemonade made from fresh lemons, nor will hardened whale-oil emulsified in soured skim milk ever replace butter But undiscriminating folk may be beguiled by, may even rejoice in *ersätze* It is reported that children after the last war preferred margarine to butter and that in the present war they welcome with acclaim ice cream made from a synthesised cream which knows more of the monkey nut than the cow, and the flour mill than the dairy farm Some of the *ersätze* have no doubt come to stay—e g margarine and lard substitutes they have for long been used in cooking, even perhaps in the kitchens of Mayfair and Belgravia But there are others whose life history it may be hoped is more ephemeral, brought to birth by a shortage of the real articles they are destined to vanish again when peace banishes shortage

No one, least of all the dietitian will deny the importance of colour, texture and flavour in food To the public, who know nothing of dietetics these are all-important It is they which cajole the money from the pocket And if, as in the examples of margarine, lard substitute and synthetic cream a sound metabolisable product is offered in place of the real thing, little harm is done Margarine is not as good as butter; it probably does not digest as rapidly in the human small intestine But it is much better than no fat at all, especially when vitaminised And "cream" synthesised[1] from a sugared flour-and-water paste in which is emulsified some hardened whale or arachis oil, may add a touch of luxury, not to speak of calories, to an otherwise bald and unconvincing bun It is otherwise with the multitude of egg, milk and citrus substitutes against which our public analysts have to wage war[2] The "egg powders"—or as they are now more correctly called "egg substitute powders"—are innocent, for the most part, of any connexion however remote with an egg, being composed of rice, starch or other finely ground cereal, baking powder and aniline dye More recently, owing to the present shortage of eggs and the availability of other raw materials, a new type of egg substitute has been evolved, containing little or no baking powder but a fair proportion of soya-bean flour Soya has a high nutritive value, but it is misleading the public to suggest that these substitutes are in any real way the equivalent of eggs Successful prosecutions have been instituted against firms making claims such as these Confectioners and wholesale bakers used to add skim-milk powder to their pastries, scones and other confectionery to produce that rich golden-brown colour beloved of the public Now that milk products have been banned for confectionery a new chromogen has been sought and found in "milk powder substitutes" These consist largely of wheat flour as a diluent, with malt sugar, milk sugar malted flour, or soya flour as the operative No particular harm is done if the sale of these is confined to the wholesale trade but unfortunately they have been placed on the retail market with directions for making custards and other dishes in which the housewife normally uses full-cream milk Custard made with egg substitute (50–66% starch) and milk substitute (51–61% starch) must be both a culinary and a dietetic disappointment Still worse are the citrus substitutes These were intended for the retail market and consisted of citric or tartaric acids and colouring matter with or without added vitamin C The claims made on the packets were grossly overstated—e g "this bottle contains the equivalent properties of sixteen squeezed lemons" On investigation it was found that this bottle contained 80 IU (4 mg) vitamin C against the 3840 IU (192 mg) which it should have had The Ministry of Food's order prohibiting the manufacture or sale of vitamin C except under licence has cut off the source of this vitamin for packers of substitute lemon and orange juices and the public analysts have the duty of seeing that claims made on packages of coloured citric acid are not unduly exaggerated

Fortunately there is legislation to deal with the whole problem of food substitutes Under section 6 of the Food and Drugs Act 1938, incorrect or misleading claims made on labels and in advertisements can be dealt with and under the Food Substitutes (Control) Order, 1941 all food substitutes must be manufactured under and in accordance with the terms of a licence granted by the Ministry of Food Under our present economic system it is essential for this control to be continued after the war is over, the Chancellor has just reminded us that essential foods will be short for years to come, and in an acquisitive society the temptation of cashing in on the people's needs is too great to be withstood After all, is that not orthodox economics?

DIVORCE FOR INSANITY

Mr A P Herbert would hardly have secured the passing of his Matrimonial Causes Bill in 1937 if he had waited till every imperfection and uncertainty had been removed from his proposals After four years' experience of the working of the Act we can now see the points where amendment would be profitable A valuable paper by Mr William Latey and Mr D Harcourt Kitchin, read before the Medico-Legal Society last month contains useful suggestions In particular, when Parliament permitted divorce for incurable insanity and evolved a formula of five years' continuous "care and treatment," anomalies were bound to reveal themselves The act takes too little notice of the temporary mental treatment which the legislature sanctioned in 1930 Voluntary treatment is allowed to count towards the five-year period, if it follows without interval a stage of detention under a lunacy order. If, however, there is a voluntary patient who comes within the Herbert Act through having been originally certified, and if he is discharged to relatives with a view to re-certification, the five-year period is interrupted by the discharge notwithstanding that the insanity persists. There would be no interruption if the voluntary patient were certified without his leaving the mental hospital; but this course, it seems, is generally avoided out of a desire not to compromise the voluntary status. Suppose again that a certified patient escapes from a mental hospital. He may be recaptured within 14 days on the authority of the manager without fresh order or certification. If he remains at large for more than a fortnight, the law requires him to be re-certified. Does this break the continuity of the statutory five-year period and deprive the sane spouse of the right to a divorce? The patient's insanity has not been interrupted. Yet another problem is presented by those elderly patients who, though incurable, are so harmless that they can live comfortably under a little supervision with relatives or with guardians found by voluntary agencies. If such patients are actually discharged, then there is no statutory insanity "under care and treatment" to give the sane spouse a remedy. If the order remains and there is an indefinite period of probation, is the five-year continuous period of care and treatment interrupted?

---

[1] *Lancet* Feb 7 1942 p 173

[2] Walker G H *J R sanit Inst* 1942 62, 85

Whatever the doubts to be removed, the chief obstacles to amendment appear to be two. First our legislators hesitate to touch a topic where they fear controversy. Scotland can reform her divorce law and her marriage law without excitement; in England it is otherwise. Secondly the statutes which deal with insanity need to be rewritten altogether. The Act of 1890, upon which the new conditions of temporary and voluntary treatment were grafted in 1930, is altogether behind the times. Whitehall has had to take notice of the administrative errors disclosed in the cases of Hall *v.* Hall and Murray *v.* Murray in 1940. Patients after a long spell of treatment in a mental hospital sometimes settle down into a harmless chronic but incurable state and may then be released to a special institution, thereby freeing beds in the mental hospital for fresh patients whose condition hospital treatment may improve. When these harmless chronic patients are pauper lunatics or, as we now call them, rate-aided persons of unsound mind, section 25 of the 1890 Act authorises their transfer to a "workhouse" on completion of two certificates. One certificate is that of the medical officer of the hospital, declaring that the patient has not recovered and that he or she is a proper person to be kept in the workhouse as a lunatic. The other is that of the medical officer of the workhouse, declaring that there is accommodation available there. Unfortunately the second of these certificates has frequently been omitted. The technical result is that the reception and detention of the patient are illegal and, the patient not being "under care and treatment" within the Herbert Act, the sane spouse has no remedy. Doubtless these irregularities of certification have mostly been corrected by subsequent recourse to the usual justice's order granted on two medical certificates; but the would-be petitioner for divorce has to wait while a fresh five-year period its course. Legislation is understood to be in prospect for curing the illegality which these cases have disclosed. The draftsman must have found himself bewildered by the tangle of the old law and the new. Improvement of our divorce law, therefore, is bound up with improvement of our lunacy law. The latter is the greater social need, though the former may illustrate its urgency.

EXTRAPERITONEAL CÆSAREAN SECTION

PATIENTS submitted to cæsarean section can be divided into three groups. There are those in whom the operation is performed in late pregnancy, or at the onset of labour, and who have had no vaginal examination. There are those who come to operation after labour has been in progress some hours and who have had one or two vaginal examinations under aseptic conditions. And lastly there are the patients operated on at the end of a long labour, who have had many vaginal examinations perhaps carelessly performed, whose membranes may have been ruptured for many hours and on whom unsuccessful attempts at vaginal delivery may have been made. For the perfectly clean cases in the first group section may be performed either by the classical method originally described by SANGER or by the lower segment transperitoneal operation. The classical section is adequate, if not ideal. Most modern operators prefer the lower segment route even in absolutely uncontaminated cases because convalescence is more comfortable, there is far less liability for adhesions to form between the uterine scar and coils of intestine, and the suture line is said to be firmer and less liable to rupture in a subsequent pregnancy or labour. For patients in group 2 the lower segment operation has decided advantages over the classical route and is unquestionably the method of choice. Infection in the puerperium has always to be reckoned with in these cases. Should it occur in the region of the scar then it is usually well away from the dangerous placental site, and in the best situation for drainage. Should a peritonitis supervene it is more likely to be localised to the lower abdomen and therefore considerably less dangerous than an infection originating from a classical incision. Thus as a general rule no cases in the second group should have the upper segment operation.

The treatment of patients who have had considerable interference and are infected at the time of operation is not so clearly defined. Operators fall into two camps—those who advocate the lower segment transperitoneal operation or some modification of it, saying that the peritoneum is quite as capable as any other structure of coping with an infection, and those who hold that if possible the operation should be completely extraperitoneal so as to minimise the risk of peritonitis. The Latzko operation is designed so that all manipulations are carried out extraperitoneally. The bladder is distended before operation, and a left paramedian incision is made down to, but not through, the peritoneum. This structure is then dissected off the top of the posterior part of the bladder, and working extraperitoneally dissection is continued until the lower anterior surface of the uterus is displayed. The uterus is then incised either vertically or obliquely, the incision extending well down to the region of the cervix, and the child is extracted WATERS has described a modification of this operation in which the lower uterine segment is incised transversely, a semilunar cut being made just as in the usual transperitoneal method, but at a higher level than in the Latzko operation There are of course many disadvantages to these procedures They are technically difficult, the cellular tissues are disturbed and there is considerable risk of cellulitis, thrombosis and embolus The large veins in the region of the broad ligament are exposed and several cases of very severe hæmorrhage have been reported Great difficulty is often encountered in the extraction of the child, and the fœtal mortality is higher than in the transperitoneal operation The peritoneum is frequently opened by accident during the approach and there is a very real risk of injuring the ureters and the base of the bladder Despite these difficulties and dangers COSGROVE and NORTON [1] of New Jersey, using a Latzko technique in some cases and a Waters technique in others, have performed 209 extraperitoneal sections Their results are impressive , there were only 4 maternal deaths in the complete series and only 11 babies were lost Since many of their cases were operated on late in labour and some were undoubtedly infected at the time of operation these results merit careful consideration Complications in the puerperium were few, probably because the uterine incision was made transversely and a little higher up than in the true Latzko operation and thus the dangerous area in the region of the base of the bladder and the ureters was avoided

In obstetrics as in general surgery it is a good principle to perform a simple operation rather than a difficult one provided the same results can be achieved For most cases seen late in labour where cæsarean section is indicated a well-planned transperitoneal operation performed under local anæsthesia involves the minimum of trauma to the maternal tissue, does away with the dangers of inhalational or spinal anæsthesia, is not unduly difficult to perform and yields good results But in the occasional case where the patient has had a good deal of interference and is already infected it seems justifiable to subject her to the additional trauma of the extraperitoneal operation, and COSGROVE and NORTON say it is not too difficult for any reasonably experienced obstetric surgeon to tackle

FUEL RATIONING

Three fuel coupons equal 1 cwt of coal, 1½ cwt of coke, 5 therms of gas, 90 units of electricity or 2 gall of paraffin [2]

Twenty-five years ago BEVERIDGE and TALLENTS were helping the Food Controller assess the caloric value of the internal fuel that drives human activities and its equitable distribution Now they are associated in a scheme to restrict equitably the consumption of external fuel, which the Minister describes as a most important and intricate problem Not so important perhaps as the food problem where an adequate ration is a matter of life and death, but maybe more intricate because the personal consumption of fuel varies within undefined limits and is largely a matter of custom and comfort, whereas the person may spend more on his modicum of food but cannot consume much more than his share Goodwill and ingenuity can no doubt achieve some saving in fuel without material loss of comfort and the sacrifice of comfort can save much more We do not yet know the extent of the sacrifice that will be called for beyond the hint in the report that an average cut of 12½% all round would secure a saving of ten million tons of coal in a year But we do know that the distribution of fuel will be based on present needs and not on past use It was lamentably obvious during the long cold spell of the late winter that the smaller consumers, especially perhaps in London, Birmingham and Glasgow, were often unable to cover their modest needs It is the aim of the scheme, as the Lord Privy Seal has put it, so to plan distribution that everybody gets that minimum amount of fuel to which they are entitled, and which indeed they must have if they are going to live If there is to be a shortage of supply it would, he said, be the essence of unfairness to ask the people of goodwill to forgo what they would like to have and leave the people of ill will free to use what the others have forgone Hence we are to have not appeals but directions SIR STAFFORD CRIPPS agreed that there will be special cases which should command consideration The bleak north will get more fuel for its longer winter Old folks who crave for warmth more than appearance can exchange some of their clothing coupons for additional fuel The needs of sick persons were also mentioned in the Beveridge report and the approved societies have asked for special attention to convalescents and the mother's need of hot water for children's baths and laundry Among the special circumstances justifying extra fuel for a household the Beveridge report mentions the doctor's consulting-room What must have been in many people's minds seems hardly to have been uttered ventilation must suffer in proportion as heating is diminished Chimneys will extract less air, windows will be opened less, doors will be shut more closely On the other hand in towns the air outside will be cleaner

PHYTIC ACID AND IRON ABSORPTION

AT a meeting of the section of anatomy and physiology of the Royal Academy of Medicine in Ireland on March 14, Prof D C Harrison quoted the experiments he made with Mellanby [1] demonstrating that the rickets-producing action of cereals is due to their content of phytic acid, which precipitates food calcium or otherwise inhibits its absorption from the gut In view of the insolubility of ferric phytate it seemed possible that phytic acid might similarly interfere with the absorption of iron, leading to anæmia To test this possibility Prof Harrison took young rats which had been made anæmic by a diet consisting entirely of milk and divided them into two groups, giving one a supplement of iron (0 3 mg of iron daily as $FeCO_3$) with a trace of copper, and the other the same with a further addition of natural sodium phytate (29–44 mg of phytic phosphorus a day) The results were not conclusive, but the phytic acid appeared to produce a slight diminution in the hæmoglobin response to iron feeding It seems clear, however, that under these experimental conditions the effect if any, is only a small one towards the five-year period, if it follows without interval a stage of detention under a lunacy order If, however, there is a *voluntary patient who comes within the Herbert Act through having been originally certified, and if he is discharged to relatives with a view to re-certification, the five-year period is interrupted by the discharge notwithstanding that the insanity persists* There would be no interruption if the voluntary patient were certified without his leaving the mental hospital, but this course, it seems, *is generally avoided out of a desire not to compromise* the voluntary status Suppose again that a certified patient escapes from a mental hospital He may be recaptured within 14 days on the authority of the manager without fresh order or certification If he remains at large for more than a fortnight, the law requires him to be re-certified Does this break the continuity of the statutory five-year period and deprive the sane spouse of the right to a divorce ? The patient's insanity has not been interrupted Yet another problem is presented by those elderly patients who, though incurable, are so harmless that they can live comfortably under a little supervision with relatives or with guardians found by voluntary agencies If such patients are actually discharged, then there is no statutory insanity " under care and treatment " to give the sane spouse a remedy If the order remains and there is an indefinite period of probation, is the five-year continuous period of care and treatment interrupted ?

---

[1] Cosgrove, S A and Norton, J F *J Amer med Ass* 1942 118, 201

[2] Exchange values suggested in Sir William Beveridge's report on Fuel Rationing to the President of the Board of Trade In preparing his scheme he was assisted by Sir Stephen Tallents (HMSO Cmd 6352 *2d*)

[1] Harrison, D C and Mellanby, E *Biochem J* 1939 33, 1660

Whatever the doubts to be removed, the chief obstacles to amendment appear to be two First our legislators hesitate to touch a topic where they fear controversy Scotland can reform her divorce law and her marriage law without excitement, in England it is otherwise Secondly the statutes which deal with insanity need to be rewritten altogether The Act of 1890, upon which the new conditions of temporary and voluntary treatment were grafted in 1930, is altogether behind the times Whitehall has had to take notice of the administrative errors disclosed in the cases of *Hall v Hall* and *Murray v Murray* in 1940 Patients after a long spell of treatment in a mental hospital sometimes settle down into a harmless chronic but incurable state and may then be released to a special institution, thereby freeing beds in the mental hospital for fresh patients whose condition hospital treatment may improve When these harmless chronic patients are pauper *lunatics or, as we now call them, rate-aided persons* of unsound mind, section 25 of the 1890 Act authorises *their transfer to a " workhouse " on completion of* two certificates One certificate is that of the medical officer of the hospital, declaring that the patient has not recovered and that he or she is a proper person to be kept in the workhouse as a lunatic The other is that of the medical officer of the workhouse, declaring that there is accommodation available there Unfortunately the second of these certificates has frequently been omitted The technical result is that the reception and detention of the patient are illegal and, the patient not being " under care and treatment " within the Herbert Act, the sane spouse has no remedy Doubtless these irregularities of certification have mostly been corrected by subsequent recourse to the usual justice's order granted on two medical certificates, but the would-be petitioner for divorce has to wait while a fresh five-year period runs its course Legislation is understood to be in prospect for curing the illegality which these cases have disclosed The draftsman must have found himself bewildered by the tangle of the old law and the new Improvement of our divorce law, therefore, is bound up with improvement of our lunacy law The latter is the greater social need, though the former may illustrate its urgency

EXTRAPERITONEAL CÆSAREAN SECTION

PATIENTS submitted to cæsarean section can be divided into three groups There are those in whom the operation is performed in late pregnancy, or at the onset of labour, and who have had no vaginal examination There are those who come to operation after labour has been in progress some hours and who have had one or two vaginal examinations under aseptic conditions And lastly there are the patients operated on at the end of a long labour, who have had many vaginal examinations perhaps carelessly performed, whose membranes may have been ruptured for many hours and on whom unsuccessful attempts at vaginal delivery may have been made For the perfectly clean cases in the first group section may be performed either by the classical method originally described by SANGER or by the lower segment transperitoneal operation The classical section is adequate, if not ideal Most modern operators prefer the lower segment route even in absolutely uncontaminated cases because convalescence is more comfortable, there is far less liability for adhesions to form between the uterine scar and coils of intestine, and the suture line is said to be firmer and less liable to rupture in a subsequent pregnancy or labour For patients in group 2 the lower segment operation has decided advantages over the classical route and is unquestionably the method of choice Infection in the puerperium has always to be reckoned with in these cases Should it occur in the region of the scar then it is usually well away from the dangerous placental site, and in the best situation for drainage Should a peritonitis supervene it is more likely to be localised to the lower abdomen and therefore considerably less dangerous than an infection originating from a classical incision Thus as a general rule no cases in the second group should have the upper segment operation

The treatment of patients who have had considerable interference and are infected at the time of operation is not so clearly defined Operators fall into two camps—those who advocate the lower segment transperitoneal operation or some modification of it, saying that the peritoneum is quite as capable as any other structure of coping with an infection, and those who hold that if possible the operation should be completely extraperitoneal so as to minimise the risk of peritonitis The Latzko operation is designed so that all manipulations are carried out extraperitoneally The bladder is distended before operation, and a left paramedian incision is made down to, but not through, the peritoneum This structure is then dissected off the top of the posterior part of the bladder, and working extraperitoneally dissection is continued until the lower anterior surface of the uterus is displayed The uterus is then incised either vertically or obliquely, the incision extending well down to the region of the

the seasonal swing of the incidence of foot-and-mouth disease is the reverse of that shown for England and Wales. In Denmark it is present all the year round and outbreaks remain high too—though the incidence of unexplained outbreaks is not known in this case

Counsel for the defence has not been heard but if he were a wise old bird it is certain that his attack must primarily fall on Bullough's first premise—namely, that these mysterious outbreaks can be accounted for only by means of an introduction from outside and by an inevitable agency of the materies morbi. He will almost certainly quote the experimental epidemiologists—Greenwood Topley and their colleagues—and talk learnedly of healthy carriers, latent infections and enhanced virulence by passage. He should at least be able to make the jury so sceptical of that first premise that it will disagree and leave the case against *Sturnus vulgaris* L. to be tried again.

vascular infiltration occurs in small amounts and systemic reactions are rare and have always cleared up satisfactorily. The patient is allowed to go home on the completion of the operation but is instructed to come next day for inspection mainly to assure him that he is still ambulatory. Binding of the thighs at the site of very prominent and tortuous veins and elastic bandages applied to the legs are used to limit excessive local reaction These bandages are removed and reapplied at the patient's first visit and the extent of the reaction noted. Further injections are determined by the judgment of the surgeon in individual cases. The skin stitches are removed on the sixth postoperative day J. M. Waugh, in discussing Heyerdale's paper, said that recurrences after combined ligation and injection treatment in the last 4 years have been about 2–3%; in 700 operations there has been no fatality At the New York Hospital six different operative procedures have been used for varicose veins in the presence of an incompetent internal saphenous vein Moore and Knapp[3] report that the best results have been obtained by simple high ligation and division, with injection of sclerosing solution at the time of operation Their technique is essentially the same as that of the Mayo Clinic, but they prefer to have the patient in hospital. In ligaturing the stump of the saphenous vein they use a suture-ligature, but place a second ligature above this to prevent blood from coming in contact with the suture or damaged intima In cases of serious incompetence of the connecting veins between the deep and superficial venous systems they ligature the saphenous at its upper end, and then at about the level of the knee, afterwards injecting the vein They think well of this operation, but have not so far followed any cases over a long period. Determination of the incompetence of the saphenous vein and of the intercommunicating veins has been described by J. J. McCallig and Heyerdale.[4] With the patient standing and a tourniquet controlling the upper end, a vein with incompetent valves in the intercommunicating veins will fill rapidly in 30 sec. Percussion of the vein, after removal of the tourniquet will send an impulse down the incompetent saphenous vein which travels to the fingers at the lower end.

Annotations

SULPHONAMIDE RESISTANCE

All the advantages of sulphonamide therapy disappear when a resistant organism is encountered, and an organism "fast" to one of the sulphonamides is usually fast to all the commonly used drugs of this group, the clinician must then fall back on pre-sulphonamide agents such as acriflavine and crystal violet. Development of sulphonamide resistance follows the same course as resistance to other antibacterial substances It can be produced experimentally both in vivo and in vitro by repeatedly passaging or subculturing a susceptible organism in the presence of increasing concentrations of a sulphonamide Resistance increases gradually and the final strain of, for instance, pneumococcus or streptococcus may be insensitive to saturated solutions of the drugs Compared with resistance to many other drugs, sulphonamide resistance is easy to induce—it is evident in one, and can be maximal in six, subcultures Its occurrence during sulphonamide therapy is therefore easily understood From the known procedures by which it is developed experimentally one could deduce that resistance would be most likely to be produced when a patient was first given small doses of the drug, followed by a gradual increase, and such is the case Hence the extreme importance of massive dosage from the outset in chemotherapy Though easily induced, resistance to sulphonamides can be very persistent, a typical instance is of sulphapyridine-fast pneumococci produced during a few subcultures which maintained their virulence and resistance during more than two hundred subcultures in the absence of the drug[1] The danger from the production of a resistant organism is unfortunately not confined to the patient in whom it is produced, for the virulence and invasiveness of further generations have been found to be as great as those of the parent strains, so that resistant organisms can be propagated in all the normal ways Minor epidemics of such organisms have occurred,[2] and are one of the arguments for a more rigid dressing technique Fortunately, resistance to one group of drugs rarely influences the susceptibility of organisms to a radically different group, though there are notable exceptions Sulphonamide resistance, therefore, is best tackled by the development of a second line of defence in new antibacterial agents not based on *p*-aminobenzenesulphonamide, such as penicillin and its relations antibacterial warfare must keep a mobile front

ACTIVITY OF LIVER EXTRACTS

The need for a test of the anti anæmic potency of liver extracts that could be carried out on animals or in vitro has long been recognised, and the absence of a satisfactory test has meant that no reliable and enforceable standard, such as we have for insulin, is available The USP has a system of units based on the results of clinical testing on patients with pernicious anæmia, but the basis of the system is not very precise though they undoubtedly give a rough guide to the dosage Laboratory assay by recording the reticulocyte response to liver extracts in guineapigs and pigeons has been tried, but the results were not clearly distinguishable from normal variation Treatment of experimental anæmias brought about by hæmolytic agents has also been unhelpful, as might have been expected since their pathology is entirely different from pernicious anæmia, nor has experimental gastrectomy—a difficult procedure—been successful Pace and Fisher[3] of Richmond, Virginia, have drawn attention to a method using standard tissue culture technique, originally described by the Swiss workers Overbeek, Gaillard, de Jongh and Yam They out small fragments of bone-marrow from the femur guineapig into a mixture of guineapig plasma, saline and dilutions of liver extracts ranging from 1 in 5000 to 1 in 150,000 From these explants migrations of cells took place and after 15 hours' incubation the area of the tion field was measured It was found that liver extracts stimulated migration and that there was a definite optim dilution at which the largest migration field was produced; further, the more "active" an extract in terms of USP units the greater the dilution needed to produce this optimal migration Hence, they say, this technique can be used to determine the activity of anti-pernicious anæmia liver extracts in vitro, and they found that if the clinical potency of an extract was destroyed—say by boiling for an hour with 2% sulphuric acid—the migration stimulating properties were also destroyed There are still many points to be explained For instance, Pace and Fisher do not mention the nature of the migrating cells (previous work has shown that they are usually fibroblasts and polymorphonuclear leucocytes), nor what relation their properties have to the pathology of pernicious anæmia, their control experiments *also seem inadequate* But the method will certainly have important applications if further work shows it to be sufficiently reliable, the Weil-Felix test serves to remind us that useful tests may be found in most unlikely circumstances

CIRCUMSTANTIAL EVIDENCE AGAINST THE STARLING

In a study[1] of the spread of foot and mouth disease W S Bullough points out that the great majority of outbreaks are easily explicable on the grounds of direct contact between cattle, or of the infection of food stuffs or bedding, or of the movements of people or vehicles But there remain those "mysterious outbreaks," from which the others are derived, occurring, he says, almost anywhere and at any time of the year, separated from the nearest infected centre by (perhaps) hundreds of miles or from the last outbreak by many months

To explain these initial foci Bullough builds up a case for the prosecution against the starling as a mechanical carrier for which many an honest juror may be prepared to convict To begin with it is the one common species of British birds intimately associated in very large numbers with pasture land, farms and cattle It frequently feeds within inches of the noses and feet of the grazing animals and will go so far as to perch on their backs In the winter it will follow them into the cattle sheds and remain in equal proximity In other words the accused was certainly "in close association with the deceased" and its movements in time and space must be inquired into Such inquiry bodes ill for the starling Migrating from Norway its habit is to go to Scotland, from other parts of the continent it prefers England and Wales The disease is rare in Scotland and almost non-existent in Norway, it is common in England and Wales and very common in Sweden, Denmark, Germany and Holland, For instance in 1925 the numbers of outbreaks reported were over 50,000 in Denmark, nearly 5000 in Sweden and none in Norway, there were 232 outbreaks in England and Wales and 0 in Scotland Observe, next, its roosting habits It may fly 40–50 miles a day from its feeding grounds to roost nightly shoulder to shoulder with some 50–100,000 birds, an admirable opportunity for the transfer of infective matter and another "mysterious outbreak" a hundred miles away Counts of these roosts have been made by ornithologists and act as an index of the numbers of birds travelling about in each month of *the year Their* trend, gentlemen of the Jury, runs nearly exactly parallel with the monthly incidence of unexplained outbreaks Lastly, Bullough observes that in Sweden the starling is absent in autumn and winter, and

---

[1] Schmidt L H, Sesler, C and Dettwiler, H A *J Pharmacol* 1942, 74, 175

[2] Francis, A E *Lancet*, 1942, i 408

[3] Pace, N and Fisher, R S *J Pharmacol* 1942, 74 256

[1] Communicated to the Royal Soc

In England Now

A Running Commentary by Peripatetic Correspondents

I AM still here on the Rock. Close on seventeen months now. The time doesn't seem so long until you stop and think about it. I find the best recipe is to keep very busy doing nothing in particular. We are extremely well supplied with doctors in this place, and as another "medical specialist" has come out to keep me company I now just about fill in my mornings, with occasionally something to do in the afternoons. It seems to be the whim of the war to pay me more than I have ever been paid before (I am now a major), and give me as little work as possible. Mind you, I'm not complaining much. Clinically life is very dull. In the last year I have seen about ten interesting cases, including some cases of typhus—these, I may hasten to add, did not occur here. We had a very interesting little outbreak of lymphocytic meningitis, which we are trying to write up, and that has been about the sum total. My card index is full of "N.A.D.," and an assortment of minor neuroses, the majority of which I am inclined to think are "try-ons," in my more jaundiced moments. But I am very kind to them all.

I have been twice for a week-end to Tangier. A nice enough little town, but it is rather invidious going over there because the troops can't go. However, they started messing about with bombs (you probably read about a small explosion there some months back) and now we don't go there, though it is supposed to be due to sterling restrictions rather than political ones. I go over the border to Algeciras on a Sunday sometimes, and have got to know a very delightful Spanish family with whom we lunch. It makes a nice break. That is of course the main crab about this place—being shut up. Otherwise it is the most perfect climate, heaps of sun, and in the spring there are masses of flowers all over the place and the Rock looks quite pretty. I had always imagined that it was much more barren. I can quite imagine how people become attached to the place. The matron of one of the hospitals has, I believe, given up her home leaves in the past rather than risk being posted elsewhere, and I have met one or two civilian employees who sing the praises of a peace-time Gib.

Things have been embarrassingly peaceful, though maybe that will change now that the French are being stirred up to give more active support to Germany. The Italians did a so-called night raid here some weeks back. I'm told a bomb was dropped, but I haven't seen any, and there was certainly no damage done. I was very amused to hear of a most florid account in an Italian paper a few days later giving the story of how their 'brave, multi-motored bombers wrought havoc here, started fires, and did much damage in the arsenal.' The people who suffered most were the inhabitants of La Linea, across the border, on whom the bits rained down from our truly magnificent barrage.

I find plenty of time for reading, and Lewis's have come up to scratch very well in sending books out to me when I have written for them. There is also a first-class little garrison library, so I am trying to acquire a little culture—i.e., I take out a novel and a serious tome, read the novel, and return them both. I also play bridge a good many evenings a week and read Culbertson. This together with a lot of squash, tennis and painting the boat helps to make the time pass. It's all very shattering for my libido, which I have to sit on hard from time to time.

* * *

Conquest of disability is a very important subject, especially in and after war, but in Mr. J. C. Hardwick's booklet of that name, commendably free from slush, some of the advice is wrong (Student Christian Movement Press, pp. 65, 2s.). The ideal disabled patients—the ones who make the most of the limbs and senses that are left to them—are seen in veterinary practice. The crippled dog tries to carry on a normal life and is only held up by pain, breathlessness, or sheer muscular inability. Eventually his unreasoning persistence is rewarded by a hypertrophy of his good limbs and increased cunning. But the reward comes only after much wearying in which envy of the healthy plays a part, and so does aggressiveness, both of which Mr. Hardwick deplores. Few can attain the fox-terrier standard, yet history has examples where overcompensation has amounted to greatness; a strong instinct of self-preservation with a logical belief that life is good, this is the dynamo of recovery, I agree; but I cannot accept Mr. Hardwick's advocacy of passive acceptance of disability—a detestable flabby heresy. Haven't the most successful patients been those who, marooned on the depleted Islands of Langerhans, have rationed themselves with zest and carried on? Or those who have played not a three-day but a life match with Koch's eleven and enjoyed it? Or one-legged men who have won swimming races? Or one-armed men who have downed burglars? Of course, struggle and zest are the keynote of conquest. Nor is enough emphasis given in this book to the fact that, even if our disabilities are such that we really are bedridden, still the best things are left to us—the thoughts and actions of mankind for three thousand years in books, perhaps the song of birds, perhaps the chance to watch things grow. Above all we can still think. The greatest adventures are not corporeal but mental.

* * *

Some of my colleagues grumble at the number of official circulars, but I find the *information they contain* invaluable. I have one grouse, however, and that is the tautology and diffuseness of official English. That mixture of the semi-legal and the leader style of the more ponderous weeklies, generously sprinkled with hideous neologisms such as "evacuee mother" and "deratisation" is irritating, obscure and confusing. And the conclusion is inescapable that the man who writes a woolly circular has a woolly mind. Most people think in words, and unless they have a due appreciation of the exact meaning of those words their minds are working with blunt tools. If I were in a position to insist, everyone who wrote official circulars would be familiar with Stuart Chase's "The Tyranny of Words," *one of the* half-dozen really important books of this century (incidentally it combines *amusement* with instruction). The unexpected appearance of verse in this column a week or so back put another idea in my head. R. L. Stevenson in *one of his* books (I think it is "Virginibus Puerisque") says that the best way to learn to write good prose is to write poetry. It needn't be good poetry, for that is a heaven-sent gift, but the stringencies of verse style teach one the value of the mot juste, the balance of a sentence, the necessity for compact statement, and the viciousness of redundancy. Of all forms of verse the sonnet is perhaps the most exacting, and is therefore the best exercise for the embryo stylist, so would it not be a good plan if official circulars were written as sonnets? A good many could easily be compressed into fourteen lines, and longer ones might make pleasant sonnet sequences. After all, medical treatises were written in verse in the 18th century—I have one on my desk, John Armstrong's "Preservation of Health," 1774. I offered this conceit to a colleague and was met by an immediate challenge to produce a sonnet circular. I have never written a circular (perhaps that is why I *find it so easy to criticise* them) and I have no claims to be a poet, but a bet is a bet.

Tumblers can be vectors of infection,
  Bacteria can lurk in drinking cups,
  And there is danger to the man who sups
Which yet he cannot spot by mere inspection.
Foremost among the pathogen collection
  Is Vincent's spirochæte to which trench mouth
  Is due. Today it's spread from north to south,
A fact the MOH should now reflect on.
So we advise immediate control
  Of washing up in public eating houses.
    If live steam can't be had, then advocate
After a rinse, five minutes in a bowl
  Of chlorine water, and a few good souses
    Under the tap. Death is the germs' sure fate.

* * *

When I was at Yale they were conducting a series of experiments on Frustration and Aggression, into which, having no sense of direction, I occasionally burst. They frustrated rats by nipping their tails in doors, at which they became aggressive towards the nearest rat; this is not the time or the place to describe some of the ways in which they frustrated monkeys. But the point was that they showed in great detail that the natural response tanks But in any case it would be extravagant to use either oil or chemical larvicides until the presence of larvæ of a man-biting species has been demonstrated This is such an easy matter that those who have the job of applying larvicide can be armed with pond nets and can supervise the tanks Each net should be fitted at the bottom with a small glass vessel into which the water drains, the captured larvæ being then easily recognisable by the naked eye Inspection need not be maintained between the months of October and March because the mosquitoes hibernate during the winter and lay no eggs Thus the water in open air tanks need not be changed or treated between these months, and only requires attention if, during the summer, larvæ are found in it When oiling must be avoided, the water can best be treated economically and effectively with coal-tar derivatives in proportions ranging from 1 part in 28,000 to 1 part in 50,000 These dilutions ought to be harmless to asphalt and bituminous linings, but the contractor should be asked to confirm this in each case Underground tanks contaminated with sewage would be the most serious source of danger It might be feasible to make the cellars in which they are housed proof against the gravid female *Culex molestus* seeking a place to deposit her eggs by fitting netting over the doors and windows

BETTER FOOD ALL ROUND

STRANGE that rationing should mean better food for the country at large , and stranger still that we should take this revolution so much for granted Prof J C Drummond, addressing the Royal Society of Arts on May 6, justly complained that, had it happened in America, the government distribution of cod-liver oil and orange juice for every infant in the country would have excited more than a passing reference in the medical press He reviewed the changes, nearly all for the better, which war has brought to our national table In the first place gross nutritional inequalities have been considerably redressed—the most striking example being found in the free and cheap milk scheme, thanks to which the poorest families covered by official surveys are now drinking weekly nearly 3½ pints of milk per head , well to do families are drinking scarcely more than 4½ pints Before the war families spending more than 18*s* a week on food were drinking nearly 6 pints a head, while those who could not spend more than 5*s* a week were unable to afford more than 1½ pints The present milk consumption of the country is actually higher than it was in 1939, but Professor Drummond would like us to set our target 100% higher than it is now, taking care that the present equitable distribution is maintained More school meals are being served , menus for elementary school kitchens are now planned to supply a balanced diet, and the principles of the Oslo meal are kept in mind He explained why " nourishing soups," so often advocated for school-children, are not the panacea their champions fancy they are too filling in proportion to their nutritive value, so that it is difficult to get 1000 calories into the child's stomach in this form, even when a thick soup is accompanied by a hunk of bread The new 85% wheatmeal loaf comes in for its just share of praise, and it is noteworthy that surveys have shown active public dislike of a buff-coloured loaf to be a bogy , on the contrary, favourable comment has been widespread Experiments in Canada[1] have led to the production of a white flour as rich in vitamin B_1 as 85% wheatmeal, and considerably richer than ordinary white flour in the other important nutrients of wheat If a demand for white bread becomes loud after the war possibly flour of this Canadian type could be used, though Professor Drummond did not suggest it , no doubt he hopes, as we do, that the country will stick to the wheatmeal loaf Experience with vegetable salads has been uniformly encouraging When even moderate pains have been taken to get people to try salads in canteens they have been accepted and become popular Shredded cabbage, grated carrot and potatoes are soon relished, and in many British restaurants a helping of such salads is served as a routine , it always gets eaten and people say they like it With an interest in salad comes a growing interest in allotments Always a nation of gardeners we turn happily to raising vegetables The Ministries of Food and Agriculture have recently shown that " a mere 300 square yards," as Professor Drummond put it, can provide all the vitamin C needed by a family of 4 during each month of the year, allowing liberally for waste and cooking losses , and the same crops will provide nearly half the vitamin A required by the family Good food is an insurance against ill health which we have been slow to value , he pointed out that in Canada one of the largest insurance companies is contributing \$500,000 towards the cost of the national nutritional campaign, in the belief that they are making a sound investment

HEAT AND SHOCK

ALL recommendations for the treatment and prevention of shock advise us to keep the patient warm The value of warmth was demonstrated during the last war when shock was always more severe in men who had been wounded and had then lain exposed to cold for hours or days But there is a tendency to interpret this advice by applying not merely warmth but heat to an injured patient For this purpose electric blankets and heat cradles are widely used, and it seems necessary to say a word of warning about their indiscriminate use, particularly in the treatment of cases seen soon after the accident Is the cold skin of the injured patient a pathological condition that requires correction, or is it part of the defence reaction of the injured organism ? Blalock and Mason[1] incline to the latter view, and believe that the skin is cold because its normal blood supply is pressed into service for more vital structures They showed that animals submitted to " shocking " procedures survived longer if their body temperatures were kept at about normal than if they were artificially raised Under the conditions of their experiments artificial cooling of the animals did not decrease the time of their survival They say that by taking too active measures to heat up shocked patients their depleted volume of blood may be diverted from supplying important internal organs in order to carry away heat from the skin Moreover unless it is designed and used with care a heat cradle may inflict severe burns on the drowsy or unconscious patient

---

MR HUGH N LINSTEAD, O B E , Ph C , who was returned to Parliament at the Putney by-election on May 8, is secretary and registrar of the Pharmaceutical Society of Great Britain

MR H B GRIMSDALE, who died at Hindhead on May 5 in his 76th year, was consulting surgeon to the Royal Westminster Ophthalmic Hospital and ophthalmic surgeon to St George's

We also regret to record the death on May 7 of DR RUSSELL ANDREWS, consulting obstetric physician to the London Hospital and one of the most popular clinical teachers of his time He was 70 years old

Colonel H E SHORTT, I M S , has been appointed physician to the King in succession to Major General P S Mills, and Colonel J S S MARTIN, I M S , hon surgeon in succession to the late Colonel E G Kennedy obtain independent advice when he considers that he has some grievance against the hospital or the medical man. But the notes are confidential documents made by the medical staff for their information. If this claim is conceded, an able advocate acting for a determined litigant may find cause for action in almost any record compiled by medical men without any thought of litigation. In one case the patient's claim was conceded, such use was made of the material that the hospital committee were frightened into paying a substantial sum in order to avoid being brought to court although it was very doubtful whether any action could have been sustained against them." The Court of Appeal have upheld this view in the case where a decision has been given on the point for the first time. A patient named Denton is bringing an action for negligence against a surgeon on the staff of the Hove General Hospital, his house-surgeon and the committee of management in connexion with an operation to his knee after an accident. A septic condition developed and he was transferred to the Municipal Hospital, when the medical superintendent called into consultation the surgeon from the voluntary hospital who had performed the operation. The leg was amputated on April 7, 1939, and four days later the surgeon wrote a report which he sent with a covering letter to the secretary of Hove General Hospital. In June 1940, the patient issued the writ in his action when the existence of this report became known and his solicitors applied for disclosure of the documents. The hospital claimed privilege on the ground that they were documents passing between the committee of management, their solicitors and proposed witnesses for the defence to the patient's action. The matter came before a master who made an order for the documents to be produced and inspected, but on appeal Hallett J. set aside the order. The patient appealed and without calling on counsel for the hospital the Court of Appeal (MacKinnon, Luxmore and Du Parcq, L.JJ.) dismissed the appeal. MacKinnon, L.J., said that the court had looked at the documents in question and were satisfied that they were documents as to which privilege could properly be claimed and according to the recognised rules of procedure the defendants were entitled to decline to consent to their inspection.

---

[1] Tisdall, F F , Jackson, S H , Drake, T G H , Newman, L H , Whiteside, A G O , Miller, H and Edgar, J *Canad med Ass J* 1941, 45, 101

[1] Blalock, A and Mason, M F *Arch Surg* 1941 42, 1051

Right Bottle and Wrong Contents

A recent case at the Yorkshire assizes (Cowie v. Holderness) raised the question whether a medical practitioner is negligent if he omits to satisfy himself as to the contents of a bottle handed to him by a trained nurse. The defendant doctor had examined a schoolboy before his evacuation to Canada. In 1938 a polypus had been removed from the boy's left ear to cure the deafness from which he suffered. The doctor, it was said, when examining him in 1940, saw some wax in the ear and poured into it a few drops of what he thought was hydrogen peroxide from a bottle, labelled as such, handed to him by one of the county council's trained nurses. Unfortunately the bottle contained turpentine. It was alleged on behalf of the plaintiff that the result was the serious perforation of the ear drum and almost complete deafness in that ear as well as pain and a general loss of health. Apparently nobody explained the presence of the turpentine in the bottle.

The judge observed that, on the issue of negligence, the only medical evidence adduced for the plaintiff was that of Mr. E. W. Bain, consulting aural surgeon of Leeds. The following question was put to this witness in cross-examination: "A trained nurse having been asked for hydrogen peroxide, and having handed to the doctor a bottle so labelled, would you expect the doctor to ascertain what the contents were?" Mr. Bain's reply was "No." He agreed that turpentine would be equally colourless and would not be detected except by the smell. Accepting this evidence, the judge held that the doctor was not negligent if he omitted to smell a bottle which appeared to contain the correct medicine, handed to him by a trained nurse from a box of medical stores. Although naturally everyone must sympathise with the plaintiff, judgment must be for the defendant doctor.

Austrian Doctor's Change of Name

Dr. Pinchas Mayersohn, an Austrian doctor registered here in that name with the police, was sentenced lately to one month's imprisonment at the Marylebone police-court for having used a name other than that by which he was ordinarily known immediately before the date when Regulation 20 of the Defence Regulations came into force. This Regulation alters the language of section 7 of the Aliens Restriction (Amendment) Act, 1919. The accused was recently acquitted at the Central Criminal Court on a charge of performing an illegal operation on a woman at a Belsize Park nursing-home. He had used the name of Dr. Fischer. According to a police witness Dr. Mayersohn held the degree of doctor of medicine of Vienna University and had practised in Vienna till April, 1939, when he came to Britain to escape from Nazi oppression. One of the conditions of his landing permit was that he should not practise privately in Britain until his name was entered on the Register. He had, said the magistrate, taken another name and performed an operation. The sentence of the court took into account the fact that he had been in custody on remand for 33 days.

PALESTINE

POPULATION CHANGES

FIGURES from the government statistical department show that in the third quarter of 1941 the Jewish population increased by 1000 and the Mohammedan by 1500, while the Christian section diminished by 225. On Sept. 30, 1941, the whole population of Palestine was 1,574,000, of whom 472,500 were Jews. The Jewish birth-rate during the quarter was 18.7 per 1000, the death-rate 7.3.

DRUG SUPPLIES

Last year insulin became so scarce that many diabetics could not obtain it and suffered in health in consequence. A communal kitchen was set up to meet their dietary needs and this proved very successful. The shortage of insulin is now less acute; there is enough for all serious cases, and those who can produce a doctor's certificate are now able to buy insulin at moderate prices.

During the first two years of the war the supply of medical drugs was well maintained by an American women's association, which sent supplies regularly to the Jewish University through the Hadassah Hospital. This enabled the university not only to maintain its own stocks but to provide necessities for other medical institutions. Since the outbreak of war in the Pacific, however, these supplies have necessarily ceased, and the hospitals are having to rely on their modest stocks and to use them with great economy.

MEDICAL RETROSPECT

The Jewish Medical Association in Palestine was founded thirty years ago. A meeting in honour of this anniversary was recently held attended by those surviving members who helped to found it.

NEW SURGICAL AND DENTAL DEPARTMENTS

On Jan. 1, 1942, a new department of brain-surgery was opened at the Jewish University Hospital at Jerusalem, under the direction of an American surgeon. A small department of wound-healing has also been opened. On Jan. 11 a new dental service was established at the hospital, to provide dental care for urgent cases, and necessary treatment for patients with a dental focus of sepsis and those requiring dental care before or after operations.

SHORTAGE OF HOSPITAL BEDS

At Tel-Aviv the Hadassah Hospital has only 300 beds, though serving a population of 250,000. During 1941, 556 urgent and 424 less urgent cases were received; but the beds were too few for the admission of patients needing lengthy observation or investigation. The obstetric ward is too small to admit all those applying; 119 women had to be refused beds during the year, and as they came from among the poorest of the Jewish population this meant that their children would have a bad start in life. The shortage of beds has sometimes been so acute that patients in urgent need have had to be turned away. The situation in the government hospital at Jaffa is much the same, and they are sometimes obliged to send infectious cases on to the Hadassah Hospital, although the responsibility for such patients properly devolves on the government hospital.

to frustration is to attack a nearby weaker object, if possible living rather than dead I thought of this the other day in the theatre Everything went wrong Quite large pieces of the table fell off, and the instruments were all the wrong size The surgeon was the most frustrated of the lot, and he attacked housemen, not individually but as a species His houseman made incomprehensible signs to the anæsthetist, who luckily had the patient Sister, clashing her forceps as summons—for all the world like an amorous pelican—directed nurses from place to place, each time more bitterly incredulous at their slowness The staff nurse moved me continually out of her, and my, way There was present no-one weaker than myself and I nursed desires to spit on the instrument table, or in some other manner commit mayhem At this stage the junior probationer dropped a tray "Holy Mary, mother of God," said the surgeon, "what has the woman passed now?" I wondered if rats ever found relief in a sense of humour, and why they had to use rats anyway

* * *

That staid business men sometimes secretly aspire to be explorers, or bishops bandits, read wild-west stories on the sly, hanker after some more primitive calling, is not a peculiarity of humanity alone, but of all cellular tissue Evolution and civilisation cramp and confine and make specialists—"You shall be a physician or a plumber or a Peyer's patch"—but the opposing force, atavism, beckons back to the self-sufficiency of the savage and the freedom of unicellular life Although many of us have come to regard the alimentary system as a bloated rentier, quietly absorbing the good things that come along, grumbling from time to time, but on the whole regular in his habits and sedate, I suspect him of longing to take part in the swaying activity of respiration In the loach it has succeeded, for in times of stress this attractive little fish is a complete intestinal breather The idea may seem strange to our habit-ridden minds, but in fact the mammalian method of breathing is a clumsy and inefficient affair, and even the hibernating frog who breathes through his surface vessels makes a much neater and quieter job of it I see that you have lately backed the possibility of gases being excreted by the intestinal mucous membrane (Feb 21, p 234) I once heard W O Meek of Frimley Sanatorium declare that he was convinced that patients with dyspnœa excreted CO_2 into their intestines, and the pot permang colonic lavage for pneumonia may be relevant here What a wonderful vista opens to our clinical vision "This case of double pneumonia, Nurse, is getting very blue Connect the gastric and duodenal tubes to the oxygen and give him 14 i b (international bubbles) a minute, and the colonic and rectal tubes to the suction apparatus Reverse them every two hours Remember to take his tyre pressure at the umbo and keep it within balloon-tyre limits (22–30) If his respirations go below 5 stop the oxygen We'll feed him intravenously"

* * *

She lay in bed at the window with masses of flowers around her The latest books were at her side, presents from many visiting friends who sometimes stayed to play bridge The wireless and cigarettes were at her hand, and a row of bottles like policemen stood ready to pounce on her nerves, should they show unrest or disrespect The great actress had tuberculosis and was being treated at home The GP was charming and complaisant "After all why not? Does it do a great deal of harm? Does not one heal better if happy?" But the specialist was a crude fellow, a barking prophet out of the Old Testament, the smell of camel was abundant and his words as from desert places "You shall go to a sanatorium or you shall not live For twelve moons you have lived pleasantly with a deadly serpent, but how shall a flabby frame withstand his onslaught? For if the mind which is the chief organ does not endure hardness in training, how can the lesser organs triumph? Salvation comes not to her who waits by the wayside, but she who strives shall come upon it For the tears of discipline are the waters of healing, but she that eats honey all day shall not be saved"

When he had gone away she wept awhile and said "Now I know why prophets live in the wilderness and why he that bears hard tidings must have private means"

The crash helmet of the military motor-cyclist reminds me of the most exciting bit of print in the *Lancet* for years—your annotation of Aug 2, 1941, on the closest up yet of the great-grandfather of all men, the spermatozoon, whose rimless bowler with a dent in it, streamlined and stark, makes him seem as unrelated to us as ever did photograph of bearded cricketer or whiskered military man Bicycling into our little coast town to buy my fish I passed many of these motor-cyclists and pondered on these things how the resemblance came from similar causes, minimising resistance in carrying the vital message, absorbing the shock of head-on encounter Yea, verily, struggles of many kinds produce similar design I find my mind much occupied nowadays with such fundamental thoughts, nor am I alone To the fisherman from whom I buy my fish I once demonstrated, on the heaving thwart of his boat, how he could find the age of flatfish by counting the rings on the otoliths, and how by the breadth of the white rings he could tell which had been the good summers As I was putting my terra-cotta-spotted plaice in my basket, he approached me earnestly "Them little bones that tell the age, do we have——?" Visions of a pathologist in the post mortem room flitted through my brain "This man has obviously been through two wars, look at the long starvation periods, here and there, but this other fellow who is the same age shows continual growth, no rings at all, certainly a black-marketeer"

Going home there is a long hill, which with a vital capacity of 1800 (how right the taxation authorities are to estimate h p by cylinder capacity) I have to walk But there are consolations, for the gardens on each side are blessed with birds, and just as war is making us ask serious questions so spring is forcing the blackbirds with one accord to sing Near the top of the hill lives the Colonel, a devout hunting man, for whom some time ago I dissected out the os penis of a fox, which, I have an awful suspicion, he uses as a tooth-pick He ambushed me just as I was hop-hopping on my bike "Halt! I want to ask you That little bone—— Do we——?"

MEDICINE AND THE LAW

A Doctor's Claim for Fees

A DISPUTE over liability for medical attendance is reported in the *Solicitors' Journal*, where county-court litigation of considerable interest is often recorded A doctor attended two children Their mother afterwards divorced the father and re-married The doctor sued the original husband and wife, the parents of the patients The wife said that the first husband ought to have paid her £2 a week under an agreement, but had in fact not paid her more than £50 in the four years since the divorce She would have paid the doctor's fees if the payments had been regularly made under the agreement, as they had not, she was obliged to refuse to pay The first husband had offered payment on conditions The doctor rejected these conditions, having been told at the outset that this defendant was responsible for the amount The Stratford-on-Avon county-court judge gave judgment against the first husband with costs including the costs payable to the wife, against whom the doctor's claim was dismissed

Privilege for Hospital Records

The Court of Appeal, in Denton *v* Brooke, Conran, and Hove General Hospital, has decided a point of considerable importance to hospitals and medical men, on which there has been some difference of opinion—whether a patient is entitled to know the contents of the hospital records relating to his own case In the United States, although the various states have legislation differing about the disclosure of documents of this character, H H Caldwell of the Chicago Bar has advised hospital administrators that the patient and his attending physician should have access to the hospital records "as a matter of right because of the fact that the physician largely contributed to the making of the record and because the facts there recorded are personal to the patient, or his legal representatives" (*Hospitals*, June, 1940, p 63) C E A Bedwell on the other hand, in a paper read before the Medico-Legal Society (*Med -leg Rev* 1941, 9, 14), observed "It is argued with a certain amount of plausibility that he [the patient] should have access to the notes in order to

Snelling and Nelson, *J Pediat* 1940, 17, 615, and a number of other workers) Moreover, though pro-hrombin deficiency is common hæmorrhagic disease of the newborn is uncommon I find myself, therefore, in agreement with Snelling and Nelson (loc cit) when they say "there is some additional factor with low prothrombin of the blood causing hæmorrhagic disease of the newborn infant"

Notwithstanding these theoretical difficulties, I consider that the treatment of hæmorrhagic disease of the newborn should be to give both vitamin K and blood-transfusions I am still not sure whether transfusions have any specific action in controlling the hæmorrhage, but they undoubtedly save lives (Capon, *Lancet*, 1937, i, 431) and in less severe cases they are of much assistance in restoring health I have not yet had sufficient experience of vitamin K to enable me to assess its value critically

In expressing these opinions I must make it clear that for me the diagnosis "hæmorrhagic disease of the newborn" signifies a condition in which spontaneous hæmorrhage occurs usually within two to four days of birth, without any apparent cause such as birth-trauma, sepsis, syphilis, &c , and it is important to maintain a strict definition which is based primarily on clinical experience The complexities of a difficult question have been increased by those workers who have wished to enlarge the scope of this syndrome in order that it may include all examples of bleeding at this age-period The paper by Sanford and others, which forms the subject of your annotation of April 18, is a welcome support to the opposition against this artificial and unjustifiable stretching of terminology You are rightly careful to refer to the bleedings as "hæmorrhagic manifestations" and not as "hæmorrhages in babies suffering from hæmorrhagic disease of the newborn," though you do not expressly state, in the words of Sanford and his colleagues "we do not believe that these hæmorrhagic manifestations are the same thing as true hæmorrhagic disease of the newborn" They make it clear, in fact, that not one of the infants in their series could be regarded as an example of hæmorrhagic disease of the newborn, and we should be grateful to them and to your annotation for stressing the importance of maintaining a strictly critical attitude

Liverpool NORMAN B CAPON

MEDICAL ASPECTS OF BOXING

SIR,—The discussion in the *Lancet* a few months ago of the medical aspects of boxing revealed a considerable diversity of opinion I therefore feel it is desirable to place additional evidence on record as it becomes available

On Feb 4, 1942, a young healthy soldier participated in a boxing match which was held under the supervision of the appropriate sporting authorities All the required conditions were fully observed Both fighters belonged to the same weight class, both were well-trained, the ring was in the prescribed state, a good referee was available, gloves of amateur size were used, and both men were seconded by experienced helpers During the second round of the fight this soldier received a blow on the jaw Although he did not fall on the floor he was, from that moment onward, completely dazed and counted out on his feet Ten minutes after the fight he received medical attention At that time he was disorientated, complaining of a severe headache Ten minutes later he was semiconscious It was noted that his left pupil was dilated and did not react to light He was removed by ambulance to hospital where he arrived completely unconscious There was Cheyne Stokes breathing, a slow pulse and a temperature of 100° F Both pupils were now dilated and did not react to light Babinski's sign was positive on both sides Barring a slight bruise at the outer angle of the left eye there was no visible evidence of injury Lumbar puncture showed blood stained cerebrospinal fluid which, however, did not escape under increased pressure Middle meningeal hæmorrhage was diagnosed and an operation was immediately performed As the patient was deeply unconscious no anæsthetic was administered A circular bone flap was raised over the left temporal area The dura was now found to be under considerable tension On incision much fresh blood escaped and an underlying laceration of the brain was seen At this stage the patient stopped breathing, and in spite of attempts of resuscitation he died shortly afterwards Post mortem examination showed laceration of left temporal lobe and extensive intracranial hæmorrhage There was no evidence of a fractured skull

No-one can deny that the blow to the chin which caused the fatal injury was delivered in accordance with the accepted rules of boxing It should especially be noted that the deceased did not fall and injure his head on the floor With regard to the mechanism of the injury I refer to p 137 of my book, "The Medical Aspect of Boxing" (Pretoria van Schaik 1941) I might perhaps repeat that every blow to the head leads to a momentary elastic deformation of the skull This deformation may easily lacerate brain tissue as well as overstretch and rupture intracranial blood-vessels, as in the present instance in which the blow produced a parenchymatous injury and a subdural hæmorrhage without fracturing the skull

Johannesburg E JOKL

THE *DIPLOCOCCUS RHEUMATICUS*

SIR,—It has seemed to us that observers of the calibre of Poynton and Paine could hardly have been entirely mistaken, when, as the result of long and careful experimental work, they announced their belief that acute rheumatism was the result of an infection with the *Diplococcus rheumaticus* As, however, their work was not generally confirmed by other workers, medical opinion has subsequently tended to the belief that this organism must have been a contaminant As the result of experience gained by us during the last two years, an alternative solution is now suggested for some of their cases

It was pointed out two years ago (Stott, A W and Copeman W S C *Lancet*, 1940, i, 1116) that meningococcal infection of the blood-stream (without meningeal symptoms) is, contrary to general belief, not uncommon, but that it is misdiagnosed in the majority of cases as "acute rheumatism", and this has been our experience here We suggest that some of the cases in which Poynton and Paine found this diplococcus may have been cases of meningococcal septicæmia, a condition which was not at that time generally recognised This form of "rheumatism," as is now known, can only be differentiated from rheumatic fever with certainty by means of blood-culture (often several) with perhaps the assistance of agglutination reactions The rash which generally occurs on the legs and upper arms is often sparse, and as it is generally non-irritant may pass unnoticed by the patient, or may be considered to be due to salicylates If it is profuse it may become confluent and present the picture of typical erythema nodosum (which was present in some of their cases), while joint and muscle pains, headaches and sweating are equally features of the meningococcal and of the classical type of rheumatism

In some of these cases of meningococcal infection of the blood-stream the meninges will ultimately become involved (Dickson, R C et al *Lancet*, 1941, ii, 631) and the resulting meningitis then runs its normal course This appears to us to be the probable explanation of the following case quoted by Poynton and Paine (Researches on Rheumatism, London, 1913, p 240)

A boy of 13 years was admitted to University College Hospital suffering from arthritis of knees and ankles and pain across the chest The boy's father had had rheumatic fever and the condition on admission appeared to be ordinary rheumatic fever also Rest and salicylates reduced the temperature, and 3 weeks uneventful convalescence (still on salicylates) followed, but this culminated in headache, vomiting and coma followed in 2 days by death At the post mortem examination no changes were found in the affected joints, the mitral valve showed a healing lesion, and the brain showed basal meningitis with turbid fluid over the whole base, and general spinal meningitis The films showed diplococci in numbers

Poynton and Paine were inclined to believe that this was a case of true rheumatic meningitis We suggest, however, that the diplococci in the pia shown in the microphotograph accompanying the case-report, are not unlike meningococci Again (p 128, loc cit), they state that diplococci were isolated by them in one case from the lateral ventricle in pure culture, while in a fatal case of "chorea," in which movements were severe and

Letters to the Editor

AIR BLOCK IN LUNG BLAST?

SIR,—In your annotation of Feb 14, 1942 (p 206), you referred to a serious condition in the newborn infant described by Gumbiner and Cutler[1] and termed "air block" by one of us (C C M[2]) Air in the anterior mediastinum was demonstrated by X ray and removed by a hollow needle We feel that air block may occur in the human subject at any age and in a wide variety of clinical conditions, and that it is usually unrecognised It has been produced experimentally in animals[3] Evidence of air in the interstitial tissues of the lungs and mediastinum has been found in an infant[4] and a young child,[5] both of whom died of air block The underlying pathological conditions and clinical manifestations have been described[6 7]

Air block originates from air which has leaked into the connective tissue of the lung from alveoli in which the pressure is unduly high or which have been overinflated The specific parts of the alveoli where this leakage occurs are the bases which rest on connective tissue, and particularly those which encircle the sheaths of the finer branches of the pulmonary blood-vessels The invading air accumulates as bubbles in the vascular sheaths and presses on the arteries and veins, so embarrassing the pulmonary circulation These bubbles travel down through the connective tissue, particularly that of the vascular sheaths, to the hilus, growing in size, and incommoding larger and larger parts of the pulmonary vascular system This interstitial emphysema interferes not only with the pulmonary blood flow but also with the normal inflation and deflation of the lungs, which are as it were splinted, and cannot be reduced to the size of deflation Thus they appear over large when removed from the thorax

With continued leakage, air escapes through the lung root into the mediastinum, where it accumulates, and so cuts down the efficiency of the cardiac and vascular functions It may cause pain like that of angina It tends to work forward between the pericardium and pleura and to accumulate under the sternum, blanketing the heart sounds and contributing its own loud grating noise, most striking in systole Here it is disclosed by lateral radiograms From the mediastinum it may dissect its way upward into the root of the neck, and even into the axillæ and beyond, or downward into the retroperitoneum, or laterally into the opposite lung, or it may rupture into the pleural cavity, producing pneumothorax

On reading the accounts of "lung blast"[8] we are led strongly to suspect that air block has arisen from the greatly altered pneumodynamic and hæmodynamic conditions The most outstanding feature which suggests this is the fixation of the chest in a position of almost maximal inspiration with but little tidal movement of air Indeed this condition might be forecast from experimental work[2] The dyspnœa, cyanosis and retrosternal pain also strongly suggest air block The rigid abdomen, too, with no lesion to explain the rigidity when laparotomy is performed, and the presence of pneumothorax in some of the patients, also fit perfectly into the picture of air block The pathological findings of hæmothorax in some patients, and of blood in the mediastinum and along the sheaths of the carotids, with no visible rupture of any vessels to explain the source of the bleeding, are again what one would expect in severe air block

Although X-ray examinations have been made, we feel that the lateral or oblique projections may best reveal the presence of air in the mediastinum, in spite of accumulated blood, which beclouds the picture not infrequently We should suggest that these cases be studied very carefully by all good methods for the presence of air block Zuckerman's[9] figures 9, 11 and 15 are interpreted by us as showing air block in experimental animals

Particularly we would urge that, when discovered, efforts at removal of the air be tried without delay Although it is common knowledge that a considerable amount of air may be absorbed from the connective tissues if the patient lives long enough, we feel that it is always a danger in the lungs and mediastinum, and may cause death Removal from the anterior mediastinum may be accomplished by Gumbiner's[1] method of tapping the pocket with a needle, or from the posterior mediastinum through a small incision in the root of the neck,[6] into which is insinuated a tube, such as a gum elastic catheter Fluid blood or serum may also be thus removed, to the advantage of the patient[7]

It is hoped that those responsible for the care of lung blast victims will promptly examine them for air block, and will give these suggestions for relief a fair trial

University of Western Ontario,
London, Canada

CHARLES C MACKLIN,
MADGE T MACKLIN

1 Gumbiner, B and Cutler, M M *J Amer med Ass* 1941, 117, 2053 —2 Macklin, C C *Trans roy Soc Can* Sect 5, 1940, 69—3 Macklin, *Canad med Ass J* 1937, 36, 414 —4 Fisher, J H *Ibid*, 1941, 44, 27 —5 Fisher and Macklin *Amer J Dis Child* 1940, 60, 102 6 Macklin *Arch intern Med* 1939, 64, 913 —7 Macklin *Med Rec* 1939, 150, 5, *J Mich med Soc* 1940 39, 756—8 O'Reilly, J N and Gloyne, S R *Lancet*, 1941, ii, 423 —Dean, D M, Thomas, A R and Allison, R S *Ibid*, 1940, ii, 224 —9 Zuckerman, S *Ibid*, 1940, ii, 219

NICOTINIC ACID IN CEREBRAL THROMBOSIS

SIR,—I would like to record a new therapeutic application of nicotinic acid, which I think we in Lisbon have been the first to try The vitamin properties of nicotinic acid have been known since 1937, its antipellagrous effect being identical with that of its amide and of quinine nicotinate, and apparently linked with the pyridine radicle Its vasodilating action, demonstrated by several workers, is evidently independent of its properties as a vitamin, since its amide has no vasodilator effect W B Bean and T D Spies, and D I Abramson and his colleagues have shown that the vasodilatation occurs in the skin and skeletal muscles, with no associated rise in blood-pressure, and argue that it is thus a purely peripheral phenomenon M T Moore has demonstrated dilatation of the vessels of the pia mater in the cat, and a rise of cerebrospinal pressure in man, after the administration of nicotinic acid, and C D Aring and his colleagues found that intravenous nicotinic acid produced an increase in the cerebral circulation, beginning shortly after the injection and accompanied by intense cerebral congestion over a period of 15–60 min I have confirmed the cerebral vasodilator action of nicotinic acid, and have recently shown that though the cerebrospinal fluid pressure and the temperature of the skin of the face both rise moderately, the arterial pressure, the retinal pressure and the respiration-rate remain the same I therefore thought it would be worth trying nicotinic acid in cases of cerebral softening following thrombosis We have given it intravenously in doses of 5–10 mg to cases of cerebral thrombosis and embolism. The treatment is harmless, it has no effect in cases where the damage is due to a large embolus, but in some cases of thrombosis it has been very successful At present, we have 3 cases showing complete or almost complete regression of symptoms of a recent hemiplegia within a few hours of the injection of nicotinic acid This cerebral vasodilator is superior to any others so far studied, and seems to have no harmful effects, even in cases with arteriosclerosis

Faculté de Médecine, Lisbon

DIOGO FURTADO

DOUBTS ON VITAMIN K FOR THE NEWBORN

SIR,—The following facts have been established by the numerous investigations made in recent years on the blood of newborn babies

(1) In comparison with normal adults, many newborn babies (normal and abnormal) have a deficiency of prothrombin during the first week of life, and especially on the 2nd and 3rd days They seem, therefore, to be in danger of bleeding

(2) The prothrombin level can be raised fairly quickly by giving vitamin K or one of its synthetic analogues to the newborn baby

(3) If the pregnant woman is given vitamin K or one of its analogues in adequate dosage the prothrombin level of her child's blood is higher than that of babies whose mothers have not been so treated

We should not, however, forget the difficulties which stand in the way of accepting prothrombin deficiency as the sole cause of hæmorrhagic disease of the newborn Babies may show well-marked deficiency of prothrombin without bleeding (Dam et al *Lancet*, 1939, ii, 1157,

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS M P

THE death of Pat Munro, M P for Llandaff, while on duty is the first Home Guard casualty at Westminster. Munro a keen man of 59 years was employed as a runner between battalion and company H Q of the Palace of Westminster Home Guard and felt it his duty to run Sir Robert Tasker, who was doing the same duty, tells me that Munro did not look quite fit but would not take things easily The work involved a period of duty all night followed by a strenuous period of sudden activity in the early morning—and collapse Munro had been a great athlete in younger days and Home Guard veterans should remember the need of training to withstand periods of strain followed by sudden exertion—the inevitable condition of Home Guard Active Service

* * *

Parliamentary business has ranged this week from the fixing of the prices of second-hand goods to fuel rationing and, in the House of Lords, a survey of projects for large-scale reorganisation of the Colonial Empire. After an interlude in which the House after a somewhat uneasy discussion, decided to refer the conduct of a member to the Committee of Privileges, the Prime Minister came in unexpectedly and announced the capture of the naval base of Diego Suarez in Madagascar This cheered the House and helped to get the debate on fuel rationing which followed into its proper perspective The significance of fuel rationing—coal, coke, gas and electricity—is that it is the rationing of a home-produced commodity which is one of our chief exports It is in fact a rationing of labour as well as material Of labour because we cannot take the equivalent of two divisions of miners back from the Services at a time when the day of a British offensive draws nearer, and of material because we may need more coal for Russia and other parts of the world-front of the Democracies Well done fuel rationing should provide adequately for the majority of consumers and give them a fair share all round while restricting waste Parliament hopes rationing of fuel will be well done and there will be further critical examination of the Government's scheme An important point to keep in mind is that fuel rationing must not be allowed to interfere with the recognised standards of public cleanliness necessary for health—nor with laundry facilities already restricted by delivery and collection difficulties and by withdrawals of man-power and of women-power. We may need a hygiene campaign with the slogan "Take more cold baths" and a return by those accustomed to luxury plumbing and constant hot water to the Saturday bath night.

* * *

Cheerfulness keeps breaking through in communiques of land, sea and air battles despite the grave danger in the East and the serious shipping position. for there is a breath of "attack" ozone in the air. And scientific thought and experience keeps breaking through despite Civil Service and Army Service prejudice In answer to a question by Mr. Ellis Smith a Labour M P especially interested in engineering, the Secretary of State for War said he was "fully aware of the importance of applying modern scientific knowledge to the solution of military problems" and announced his decision to appoint a scientific adviser to the Army Council The appointment of "officers with the necessary scientific and technical experience to General and Formation Headquarters in theatres of war" is also to be extended In view of this perhaps the blank space in the General-Staff plan published by the Government recently will be filled up The officers of the General Staff are many as set out in this plan But not one of them is specifically a scientific expert on the mechanical side of war And not one of them is a scientific expert of the medical service concerned with getting the best out of the soldier in body and mind No doubt scientific advisers are 'attached,' but they should be included in the original and first consultations

All these questions were to have been discussed by the House before Whitsuntide. There is to be a two-day debate on the war, but it will probably only touch on these matters and be more concerned with trying to dig out information as to responsibility for our defects in Malaya and the East The larger scientific discussion on General-Staff problems will not come on until later But behind the scenes discussion is continuing

QUESTION TIME

Nursing Cadet Corps

Sir FRANCIS FREMANTLE asked the President of the Board of Education if his attention had been drawn to the proposal of the Hertfordshire education authority for the institution of a nursing cadet corps to fill the gap between school and professional nursing, and whether, in consultation with the General Nursing Council and the Minister of Health, he would give it his most favourable consideration.—Mr R A. BUTLER replied My attention has been called to these proposals, and if they are formally submitted they will receive careful consideration. In so far as they are intended to provide a preparation for hospital nursing they would have to follow the principles agreed with the General Nursing Council.

Sir F FREMANTLE Does the Minister recognise that this proposal is not only for hospital nursing, but also for hospital nursing and general education for maternity nursing for those girls who like to choose it?—Mr BUTLER Yes —Mr K. LINDSAY In view of the shortage of organisations into which girls of 16–18 can be directed does the Minister consider that this excellent experiment in Hertfordshire should be encouraged in other counties, in view of the shortage of nurses? No further reply was given.

Extra Fuel for the Sick

Mr I C HANNAH asked the President of the Board of Trade whether it was proposed to make any extra ration of fuel available for the sick, especially workers temporarily disabled by rheumatism or bronchitis —Mr E. DALTON replied Special provision will certainly be necessary in the case of sickness

Deaths from Tuberculosis

Replying to questions the Minister of Health gave the number of deaths in England and Wales from tuberculosis as follows —

ENGLAND AND WALES

—		1938	1939	1940	1941 (Provisional)
Respiratory tuberculosis	Males	12 445	12 702	13 920	13 986
	Females	8837	8840	9740	9648
Other forms of tuberculosis (including tub meningitis)	Males	2261	2229	2381	2652
	Females	1996	1852	2103	2384
Tuberculous meningitis	Males	918	868	957	1196
	Females	873	816	929	1170

Mr T JOHNSTON also gave the following figures for Scotland —

Year	Respiratory tuberculosis			Tuberculous meningitis			Other forms of tuberculosis		
	M	F	Total	M	F	Total	M	F	Total
1938	1396	1185	2581	198	192	390	237	224	461
1939	1506	1211	2717	193	184	377	218	214	432
1940	1669	1368	3037	242	243	485	244	237	481
1941	1645	1472	3117	267*	300*	567*	249*	242*	491*

* These figures are provisional M male, F, female

Recruitment of T.O.s

Mr GLENVIL HALL asked the Minister of Health how many full-time tuberculosis officers had been taken into the Armed Forces from London, the rest of England and Wales, respectively, and if he was satisfied that where such officer had been taken from civilian work suitable alternative arrangements had been made —Mr BROWN replied One full time tuberculosis officer in London, and nine in the rest of England and Wales, have been recruited for the medical branches of H.M. Forces on the recommendation of the Central Medical War Committee In each instance I was advised that suitable alternative arrangements could be made by the employing authorities, and in five of the cases, the one in London and the heart little affected, numerous diplococci were found in the perivascular spaces of the pia mater As they point out it seems probable that there is a clear association between "rheumatic" chorea of this type and the occurrence of diplococci in the brain and its membranes

The *Diplococcus rheumaticus* was not invariably present in their rheumatic cases, nor did they claim that this was the only cause of the disease They produce some evidence to show that these rheumatic fever cases may be in certain conditions both infective and infectious—almost epidemic They cite cases where more than one member of a family was affected with acute rheumatic fever at the same time—e g , two children sleeping in the same bed The accurately recorded case-histories of many of the cases detailed in which diplococci were found are not inconsistent in any way with those observed by us in cases in which we have recovered the meningococcus from the blood-stream We suggest, therefore, that the diplococcus isolated from their cases may in fact have been a meningococcus

The diplococcus described by Poynton and Paine (loc cit) was difficult to grow, and often refused to grow on a medium unless blood or serum were added to it It was easily stained by the aniline dyes, but did not retain Gram's stain with great tenacity Degenerate forms were common—it became swollen and pear-shaped In bouillon there was turbidity with slight flocculent deposit in 24 hours, with distinct deposit in 3 days The medium became acid On blood agar (one of the best media) minute colonies were visible in 24 hours which tended to remain discrete and to turn the blood pigment a rusty-brown On this medium the diplococcus would live for long periods—this latter characteristic appearing to point against the identity of the diplococcus with a meningococcus

It seems to us from a study of the full evidence that they were in their cases in all probability dealing with two types of organisms—a gram-negative diplococcus, and an organism which took on the appearance of a streptococcus on culture It is with the former organism that the remarks in this letter are concerned

To summarise, we suggest that in some at least of the cases recorded by Poynton and Paine of acute rheumatic fever in which the *Diplococcus rheumaticus* was found the symptoms and course were identical with those cases which have more recently been shown to be due to a meningococcal infection of the blood-stream without meningeal involvement, and that the diplococcus may therefore be a form of meningococcus

W S C COPEMAN,
W STEWART

MIDDLE MENINGEAL HÆMORRHAGE WITHOUT FRACTURE

SIR,—The paper in the *Lancet* of May 2 (p 532) by Mr Falconer and Dr Schiller on traumatic hæmorrhage from the middle meningeal artery without fracture of the skull is of particular interest to us because we have had an instance only this week

A boy aged 15 was hit on the right side of the forehead by a blunt stone (said to be "about the size of a sixpence") catapulted from a distance of 30 yd He walked home unaided with an increasing headache and proceeded to vomit and cry He was admitted to hospital under Mr G H Marshall (to whom we are indebted for permission to publish this case) just two hours after the accident He was seen by one of us (D C L), and was found to be pale, shocked and stuporose He was unable to answer questions but responded freely to stimuli The pupils were equal in size but only the left reacted Signs of cerebral irritation developed rapidly, the head being deviated to the right Within an hour the pupils were both immobile, the right grossly dilated, the left contracted Bilateral convulsions were taking place, more severe on the right side With his right hand he made vigorous scratching movements of his head, abdomen and genitalia Abdominal reflexes were absent There was extensor plantar response and ankle clonus on the left side A diagnosis of extradural hæmorrhage was made but deterioration was too rapid to permit of operative intervention The boy died four hours after the accident

At autopsy there was found to be a small abrasion of the skin, about 1 cm in diameter, some 6 cm above the zygoma and 3 cm behind the external angular process There was bruising of the underlying frontalis muscle but no sign of a fracture A massive soft blood clot was found extradurally displacing the right frontal lobe mesially and posteriorly, having spread round over the frontal pole The source of bleeding was the anterior branch of the right middle meningeal artery The surface of the brain, more particularly of the right hemisphere, was swollen, the sulci being flattened out The white matter underlying the right frontal cortex showed numerous petechial hæmorrhages, but there was no bleeding in the pons

Probably, as Falconer and Schiller contend, the occurrence of traumatic rupture of the middle meningeal vessels in the absence of fracture of the skull is not yet sufficiently recognised The word "vessels" is used instead of artery because Wood Jones suggests that the delicate venæ comites are more likely to be torn than the artery (quoted by Hamilton Bailey in Emergency Surgery, Bristol, 1938, p 488) A suggestion as to the mechanism of rupture is given by both Gray (Anatomy, London, 22nd ed 1923, p 618) and Rose and Carless (Manual of Surgery, London, 1937, p 878), who state that the artery may be ruptured by a blow on the head sufficiently severe to detach the dura mater but without causing injury to the bone, the artery being carried with the displaced membrane If this theory is correct, one would expect this condition to be fairly common in war-time, and it would be interesting to know if it occurred as the result of blast The possibility of an undue friability of the vessel walls, or, more likely, an inherent defective structure of the arteries at bifurcation analogous to that found in congenital aneurysms of the cerebral vessels should not be overlooked In our case the source of bleeding was posterior to the surface wound, and this suggests that the blow was transmitted , it seems more likely that the initial lesion was a slight separation of the dura mater with tearing of the artery, and that this separation was increased by the pumping action of the artery Sir Charles Bell's astonishment at the ability of the severed artery to tear off the dura mater from the overlying bone was echoed by us in the post-mortem room, but we concluded that this feat would be rendered more difficult with advancing years owing to the increasing fixity of the membrane to the bone, while the likelihood of a fracture of bone, on the other hand, would increase Is extradural hæmorrhage without fracture in point of fact more frequent in the young ?

D C LITTLE,
Worcester Royal Infirmary W H MCMENEMEY

SIR,—The death of one of Montaigne's brothers, to which Mr Max Page refers, reminds one of the death of King Charles VIII of France, in 1498, at the age of 27¾ years It seems that in running through the passages of the Castle of Amboise to join a hunting party, which was waiting for him, he hit his head against the sloping side Nevertheless he took part in the hunt, but gradually ingravescent coma came on, from which he died Montaigne, in the chapter referred to, does not mention this, though he alludes to the "recent death" of a King of France, evidently Henry II, who died in 1559 from the result of a wound received at a tournament

Harley Street, W 1 F PARKES WEBER

MOVEMENT OF FOREIGN BODIES IN THE TISSUES

SIR,—In response to Prof Lambert Rogers's appeal in your issue of March 28 I should like to record a case I saw about a year ago of a needle travelling in the tissues A child aged eighteen months had been bumped on the floor by an elder brother and a needle had entered his left gluteal region X rays showed the needle to be lying about one inch above the greater trochanter, behind the acetabulum, and the wound of entry confirmed this The following day I explored the buttock and after an hour's fruitless search I abandoned the operation About six days later I was called to the children's ward and the needle was seen to be lying in the muscles of the anterior abdominal wall, roughly in the position of McBurney's point but on the left side The needle was swinging in the muscles on respiration and was easily removed under a local anæsthetic, when an uneventful recovery took place I can only suggest that the vigorous muscular movements in a child and the exertions of crying caused the needle to traverse the muscle bellies

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS M P

THE death of Pat Munro, M P for Llandaff, while on duty is the first Home Guard casualty at Westminster Munro, a keen man of 59 years, was employed as a runner between battalion and company H Q of the Palace of Westminster Home Guard and felt it his duty to run Sir Robert Tasker, who was doing the same duty, tells me that Munro did not look quite fit but would not take things easily The work involved a period of duty all night, followed by a strenuous period of sudden activity in the early morning—and collapse Munro had been a great athlete in younger days, and Home Guard veterans should remember the need of training to withstand periods of strain followed by sudden exertion—the inevitable condition of Home Guard Active Service

* * *

Parliamentary business has ranged this week from the fixing of the prices of second-hand goods to fuel rationing and, in the House of Lords, a survey of projects for large-scale reorganisation of the Colonial Empire After an interlude in which the House, after a somewhat uneasy discussion, decided to refer the conduct of a member to the Committee of Privileges, the Prime Minister came in unexpectedly and announced the capture of the naval base of Diego Suarez in Madagascar This cheered the House and helped to get the debate on fuel rationing which followed into its proper perspective The significance of fuel rationing—coal, coke, gas and electricity—is that it is the rationing of a home-produced commodity which is one of our chief exports It is in fact a rationing of labour as well as material Of labour because we cannot take the equivalent of two divisions of miners back from the Services at a time when the day of a British offensive draws nearer, and of material because we may need more coal for Russia and other parts of the world-front of the Democracies Well done fuel rationing should provide adequately for the majority of consumers and give them a fair share all round while restricting waste Parliament hopes rationing of fuel will be well done and there will be further critical examination of the Government's scheme An important point to keep in mind is that fuel rationing must not be allowed to interfere with the recognised standards of public cleanliness necessary for health—nor with laundry facilities already restricted by delivery and collection difficulties and by withdrawals of man-power and of women-power. We may need a hygiene campaign with the slogan "Take more cold baths" and a return by those accustomed to luxury plumbing and constant hot water to the Saturday bath night.

* * *

Cheerfulness keeps breaking through in communiques of land, sea and air battles despite the grave danger in the East and the serious shipping position for there is a reath of "attack" ozone in the air And scientific hought and experience keeps breaking through despite ivil Service and Army Service prejudice In answer o a question by Mr Ellis Smith, a Labour M P especilly interested in engineering, the Secretary of State for War said he was "fully aware of the importance of pplying modern scientific knowledge to the solution of military problems" and announced his decision to appoint a scientific adviser to the Army Council The appointment of "officers with the necessary scientific and technical experience to General and Formation Headquarters in theatres of war" is also to be extended In view of this perhaps the blank space in the General-Staff plan published by the Government recently will be filled up The officers of the General Staff are many as set out in this plan But not one of them is specifically a scientific expert on the mechanical side of war And not one of them is a scientific expert of the medical service concerned with getting the best out of the soldier in body and mind No doubt scientific advisers are "attached," but they should be included in the original and first consultations

All these questions were to have been discussed by the House before Whitsuntide There is to be a two-day debate on the war, but it will probably only touch on these matters and be more concerned with trying to dig out information as to responsibility for our defects in Malaya and the East The larger scientific discussion on General-Staff problems will not come on until later But behind the scenes discussion is continuing

QUESTION TIME

Nursing Cadet Corps

SIR FRANCIS FREMANTLE asked the President of the Board of Education if his attention had been drawn to the proposal of the Hertfordshire education authority for the institution of a nursing cadet corps to fill the gap between school and professional nursing, and whether, in consultation with the General Nursing Council and the Minister of Health, he would give it his most favourable consideration.—Mr R A. BUTLER replied My attention has been called to these proposals, and if they are formally submitted they will receive careful consideration. In so far as they are intended to provide a preparation for hospital nursing they would have to follow the principles agreed with the General Nursing Council.

Sir F FREMANTLE Does the Minister recognise that this proposal is not only for hospital nursing, but also for hospital nursing and general education for maternity nursing for those girls who like to choose it?—Mr BUTLER Yes—Mr K. LINDSAY In view of the shortage of organisations into which girls of 16–18 can be directed does the Minister consider that this excellent experiment in Hertfordshire should be encouraged in other counties, in view of the shortage of nurses? No further reply was given

Extra Fuel for the Sick

Mr I C HANNAH asked the President of the Board of Trade whether it was proposed to make any extra ration of fuel available for the sick, especially workers temporarily disabled by rheumatism or bronchitis—Mr E. DALTON replied Special provision will certainly be necessary in the case of sickness

Deaths from Tuberculosis

Replying to questions the Minister of Health gave the number of deaths in England and Wales from tuberculosis as follows —

ENGLAND AND WALES

—		1938	1939	1940	1941 (Provisional)
Respiratory tuberculosis	Males	12 445	12 702	13 920	13 986
	Females	8837	8840	9740	9648
Other forms of tuberculosis (including tub meningitis)	Males	2261	2229	2381	2652
	Females	1996	1852	2103	2384
Tuberculous meningitis	Males	918	868	957	1196
	Females	873	816	929	1170

Mr T JOHNSTON also gave the following figures for Scotland —

Year	Respiratory tuberculosis			Tuberculous meningitis			Other forms of tuberculosis		
	M	F	Total	M	F	Total	M	F	Total
1938	1396	1185	2581	198	192	390	237	224	461
1939	1506	1211	2717	193	184	377	218	214	432
1940	1669	1368	3037	242	243	485	244	237	481
1941	1645	1472	3117	267*	300*	567*	249*	242*	491*

* These figures are provisional M, male, F female

Recruitment of T O s

Mr GLENVIL HALL asked the Minister of Health how many full time tuberculosis officers had been taken into the Armed Forces from London, the rest of England and Wales, respectively, and if he was satisfied that where such officer had been taken from civilian work suitable alternative arrangements had been made—Mr BROWN replied One full-time tuberculosis officer in London, and nine in the rest of England and Wales, have been recruited for the medical branches of H.M Forces on the recommendation of the Central Medical War Committee In each instance I was advised that suitable alternative arrangements could be made by the employing authorities, and in five of the cases, the one in London and

Medical News

University of Oxford

On April 30 the following degrees were conferred —

M D —* Reginald Passmore

M B —W M Tucker P C Reynell, R J Rossiter, K G Westcombe, R G. Ladkin P R Wright, E A Spriggs A P Binks, H A W Forbes, M P Lewis, C G Phillips, J M Walker, James Ackerley, B F Swynnerton, R M Mason, E H Seward R G Sykes, C R S Jackson, P W Roe, C A Simmons, R B Crail, C H Jellard, Mary F Richardson, * D F Macgregor, * C L Hall, and * A H Ferguson

* In absence

University of Cambridge

The title of the degrees of M B , B Chir has been conferred on Mrs K Ferguson of Newnham College

Society of Apothecaries of London

G K Coombes, King's Coll and West Lond and J A Dodds, Manc having completed the final examination, are granted the diploma of the society entitling them to practise medicine, surgery and midwifery

Medico-Legal Society

A meeting of this society will be held at 26, Portland Place, London, W 1, on Thursday, May 28, at 5 45 P M , when Mr C E A Bedwell will read a paper on Medical Members of the Inns of Court

Royal Society of Arts

On Wednesday, May 20, at 1 45 P M , this society will meet at its house in John Adam Street, Adelphi, London, W C 2, when Prof H D Kay, D Sc , will speak on the future of the milk industry

Society for Relief of Widows and Orphans of Medical Men

The annual general meeting will be held on Wednesday, May 20, at 11, Chandos Street, London, W 1, at 5 P M

Medical Casualties

The deaths of Major R L Frost, M R C S , I M S and Captain P A Narayan, I M S , were announced in a recent casualty list Captain E V Parker, M B Durh , R A M C , and Lieut Colonel J L O'Neill, L R C P I , I M S , have been posted as wounded Major N. I McLeod, L M S Nova Scotia, I M S , is reported missing, and Captain J A Glover, M B Camb , R A M C , has also been missing since the fall of Singapore

Royal Medico-Psychological Association

This society will meet on Wednesday, May 20, at the County Offices, Preston, at 10 30 A M , when Mr Thomas Graves, the president, will open a discussion on ear, nose, and throat disease in mental disorder and collaboration in its investigation and treatment Mr H G Bedford Russell, Mr W Stirk Adams, Dr J J Craig, Dr F A Pickworth and Dr H F Fenton will also speak

Royal Society of Medicine

The fellows of this society will meet at 5 P M , on Tuesday, May 19, to nominate officers and council for next year and to ballot for the election to the fellowship At 4 30 P M , on the same day, at the section of psychiatry, Dr Felix Brown will read a paper on the heredity of psychoneuroses On May 21, at 5 P M , at the section of dermatology, Dr Sybil Horner will speak on industrial dermatitis, Dr A D K Peters on dermatitis in filling factories, and Major W J O'Donovan on dermatitis castrensis The section of neurology will meet at 4 30 P M on the same day, when Major Hugh Garland, Mr Norman Dott and Mr Grey Walter will open a discussion on traumatic epilepsy At the section of epidemiology and state medicine on May 22, at 2 30 P M , Dr T F McNair Scott and Dr Paul Beeson will speak on acute myalgia of the neck and shoulders and its possible relation to generalised fibrositis The section of disease in children will hold a joint meeting with the maternity and child-welfare group of the Society of Medical Officers of Health on May 22, at 5 P M , when Dr Alan Moncrieff, Dr C E Field, Dr Nora Wattie and Dr Virginia Saunders Jacob will be the openers in a discussion on the prevention of chronic lung diseases in childhood

Applications for the William Gibson research scholarship for medical women should be sent to the secretary of the society, 1, Wimpole Street, London, W 1, not later than June 1

London School of Dermatology

A course of lectures on skin diseases in war-time is being held at the London Hospital for Diseases of the Skin, Lisle Street, W C 2, on Wednesdays, at 4 30 P M On May 20 Dr William Griffith will speak on eczema, on May 27, Dr R T Brain on psoriasis , on June 3, Mr Henry Corsi on pus coccal and ringworm infections , and on June 10, Dr J E M Wigley on scabies and parasitic infections

Westminster Hospital

A gift of £4000 has been made to this hospital by a former patient to establish the Keystone fund for radium research

EIGHTEEN delegates from non-teaching voluntary hospitals in Lancashire met at the District Infirmary, Ashton under Lyne, to consider the formation of an association which would concern itself with the welfare of the hon medical staffs of these hospitals now and after the war A resolution was passed setting up the Medical Staffs' Association of Non teaching Voluntary Hospitals of Lancashire Further information may be had from the acting temporary hon secretary, Dr Bernard Bowman, District Infirmary, Ashton under-Lyne

The Honyman-Gillespie lectures which are being held at the London Homœopathic Hospital on Tuesdays will take place at 3 P M

MEMBERS of the public in Germany are now forbidden to give testimonials for proprietary medicines (*Klin Wschr* Feb 21, 1942, p 192)

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export

Appointments

Colonial Medical Service —The following appointments are announced —

BRUCE L G , M B GLASG medical officer, Uganda,
ELLIS JONES D W , M B LPOOL medical officer, Tanganyika,
LAWES, W E , L R C P F medical officer, Kenya ,
SINGLETON, A C B , M B ABERD medical officer, Kenya , and
WILKINSON, P B , M B LOND , M R C P district medical officer, Cyprus

Births, Marriages and Deaths

BIRTHS

COLEMAN —On May 2, at Hertford, the wife of Mr Mark Coleman, M S —a son

FISHER —On May 11, in London, the wife of Dr J W Fisher—a daughter

GOOD —On May 8, at Aylesbury, the wife of Lieut Colonel Michael Good, R A M C —a son

JAUCH —On May 9, at Grantham, the wife of Mr F Joscelin Jauch, F R C S —a daughter

LERNER —On May 9, in London, the wife of Captain Alec Lerner, R C A M C —a son

PHILP —On May 6, at South Croydon, the wife of Capt R. A Philp, R A M C —a daughter

PRATT —On May 7, in London, the wife of Dr J S Pratt—a daughter

WARE —On May 2, at Bury St Edmunds, the wife of Dr H A Ware—a son

WIGRAM —On May 5, at Oxford, the wife of Captain Edmund H L Wigram, R A M C —a son

MARRIAGES

EVANS—FOORD —On May 8, at Speldhurst, Kent, Gwilym Rhys Evans, M B , lieutenant R A M C , to Jean Marjorie Foord

WATT—STEWART —On May 9, at Aberdeen Leslie Watt, M B , captain R A M C , to Freda F Stewart, 2/subaltern, A T S

WOOD—SUTCLIFFE —On May 9, in London, Benjamin Stuart Blackford Wood, B M , R A M C , to Elizabeth Cowan Sutcliffe, M B

DEATHS

ANDREWS —On May 7, at Iford near Lewes, Henry Russell Andrews M D LOND , F R C P , F R C O G , aged 70

CHAFFEY —On May 8, at Hove, Wayland Charles Chaffey, M D LOND , aged 86

COUPER —On May 5, Samuel Barrett Couper, B A CAMB , M R C S , of Blaby Leicestershire

FITCH —On May 11, Laurence Percival Fitch M R C S aged 34

FOX —On May 9, at Crawley Down, Sussex, Harry Andrew Fox, M R C P E , D T M & H , D P H

GRIMSDALE —On May 5 at Hindhead, Harold Barr Grimsdale, M B CAMB , F R C S formerly of Cambridge Gate London

SPURRELL —On May 9 at Banningham, Aylsham, Norfolk, William Dewing Spurrell, M R C S aged 76

WARD —On May 3, at Calmpton, near Brixham, Thomas Hamilton Ward M D EDIN aged 76

WEBB —On April 17 Charles Alfred Webb, M R C S , D P H , colonel late R A M C retd aged 84

MINIATURE MASS RADIOGRAPHY IN THE RAF

REVIEW OF 20,000 EXAMINATIONS

R R TRAIL, M C, M D ABERD, F R C P
PHYSICIAN TO THE ROYAL CHEST HOSPITAL, LONDON, AND SURGICAL UNIT, PAPWORTH, WING COMMANDER, RAFVR

IN November, 1941, the Royal Air Force began the examination of personnel by miniature radiography The results now under review are in 20,000 men Allied personnel are not included It is hoped at an early date to publish a comparative study of young women in the WAAF

EQUIPMENT

Two types of equipment are being used The first is one loaned to the RAF by the British Red Cross It consists of a Solus four-valve transformer unit, exciting a rotating anode 'Dynamax' tube The fluorescent screen is of the Levy West type, protected on the side next to the camera by lead glass A special camera, designed by Newman, with an F 1 5 'Xenon' lens, is set at 36 in from the screen at the apex of a light-proof tunnel The film is moved by hand after each exposure A fixed fluoroscopic focused grid of the Schonander type, made by Solus, is placed between the patient and the fluorescent screen Exposure factors are as follows 100 mA, 80–90 kV, exposure 0 25 to 0 5 sec

Equipment of the other type is a gift of the American Red Cross Each set arrived in a van, in which it can be used, for a small power plant to energise the equipment is supplied All units but one, however, have been made static The set consists of a Westinghouse condenser discharge unit, exciting a Machlett stationary anode tube There are two one-quarter microfarad condensers charged by a 30 mA, half-wave rectifier The fluorescent screen is a Patterson type B, protected on the side next to the camera by lead glass A special camera designed by Kodak Ltd, in conjunction with RAF technicians, with an F 1 5 'Sonnar' lens, is set at 36 in from the screen at the apex of a light-proof tunnel The film is moved by hand after each exposure The tube has a focal spot of 4 2 mm and is placed 42 in from the screen, the movements of tube and screen being coördinated, and controlled by a hand wheel operated at the screen end

The film used in the examinations is Kodak 'Flurodak,' developed for eight minutes at 65° F in Johnson's standard developer

CONDENSER AND VALVE RECTIFIER COMPARED

How does the condenser unit compare with the output of the more usual English form of valve-rectified equipment? The mA seconds used by the condenser discharge unit are half the kV peak (for one-half microfarad capacity) The peak used varies between 70 and 90 In comparing exposure values of the two units it should be borne in mind that the relative distribution of energies supplied by the two types of equipment is very different The condenser discharge film is not nearly so flat or so lacking in contrast as would be a film taken at the same kV peak on standard equipment On the other hand, one mA second in condenser discharge work has not the "film-blackening" power of one mA second from good rectified equipment The film of the condenser unit is more comparable with one taken by standard equipment under the same or slightly lower mA seconds, but at a kV peak from 5 to 10 lower The milliamperage used is approximately 100, and while the discharge time of the condensers may be under 0 5 sec the radically different nature of the energy supplied must be taken into account As the discharge takes place the kV peak declines, and after 0 2 sec is so low that it no longer contributes effectively to the density of the film Effective exposure values are therefore quite short under 0 2 sec The resulting film has good contrast and shows no motion In judging kV, for both types of equipment, muscular development as assessed by a trained radiographer has been found to be definitely superior to chest measurement It is interesting to note the relative proportion of large films taken, for all purposes, on 5000 miniatures four valve unit 2 1%, condenser unit 2 5%

Neither type of unit is perfect In the Westinghouse unit condensers of larger capacity, up to one microfarad would be a decided advantage With the present Westinghouse unit it would require two films, anteroposterior and posteroanterior, to challenge comparison with the single film of the four-valve unit The reading of chest films, particularly miniature films, is of course a matter of training and experience Eventually results must stand or fall on the team work of the unit

THE CLINICAL UNIT IN ACTION

Each unit consists of one medical officer, and at least seven other ranks, including a trained radiographer, two photographers, two clerks, a positioner and a marshaller. Smooth and efficient working is attained with round 100 examinations per hour The first unit was trained on over 1000 examinations (not under review here) Each successive team has been trained at one particular centre In addition, to attain uniformity, each medical officer, chosen for his knowledge of chest work, has had a course of special instruction at headquarters This covers a scheme of physical examination and film reading on all normalities and abnormalities likely to be encountered with practical application on hospital and unit patients

From the first it was agreed that the miniature film reaches the limits of its usefulness in showing a variation from the normal which requires further investigation, clinical and pathological To each unit therefore a number of observation beds were allocated in the nearest sick-quarters, with equipment to carry out large film examinations, sedimentation-rates and sputum tests Exercise tests on pulse and temperature are made on every case under observation Finally, every film of doubtful interpretation is sent with full particulars of history and investigations to headquarters unit Where there is still doubt the patient is taken off all training entailing fatigue and is seen regularly for complete re-examination at intervals not beyond eight weeks, until a final decision can be reached The results here set out are built on an interpretation made as generous as possible, no case is considered tuberculous unless it has satisfied the criteria laid down and leaves no reasonable doubt of the diagnosis

RESULTS

The results may conveniently be set out in tabular form, classified in age-groups

NUMBERS SHOWING X RAY EVIDENCE OF PULMONARY TUBERCULOSIS

Age	Under 20	20–24	25–29	30–34	35 & over	Totals
Number examined	8984	6631	2545	1467	342	19,969
Active	24	21	4	3	2	54 (0 27%)
Inactive	11	24	21	10	1	67 (0 33%)
Total	35 (0 40%)	45 (0 68%)	25 (0 98%)	13 (0 89%)	3 (0 87%)	121 (0 60%)

Sputum examination in cases considered active TB+ 17 (31 5%), TB− 30 (55 5%), no sputum 7 (13%) Of these 54 cases 25 had moderately advanced or advanced disease In addition the films showed calcified nodules, calcified glands, or both in 168 cases (0 84%)

Total evidence of tuberculous infection = 121 + 168 = 289 (1 45%)

It will be noted that 31 (0 15%) are missing This means that before being posted to another station these personnel had not been called back for one of the following examinations repeat of small film, large film, or clinical examination Most of the 31 cases occurred in the first four weeks of working, of the last 5000 examinations, only one is missing

No conclusions can be drawn from the apparent incidence in the age-groups above 30, and little from the age-group 25–29 This will, it is hoped, be amended by the fast growing numbers of examinations at new units Six cases are under observation on the routine outlined above Cases of lung abnormalities outside tuberculosis number 100 Of these, 46 had evidence of thickened pleura in one costophrenic angle, considered to be the

Medical News

University of Oxford

On April 30 the following degrees were conferred —

M D —* Reginald Passmore

M B —W M Tucker P O Reynell, R J Rossiter, K G Westcombe, R G Ladkin P R Wright, E A Spriggs A P Binks, H A W Forbes, M P Lewis, C G Phillips, J M Walker, James Ackerley, B F Swynnerton, R M Mason, E H Seward, R G Sykes, C R S Jackson, P W Roe, C A Simmons, R B Crail, C H Jellard, Mary F Richardson, * D F Macgregor, * C L Hall, and * A H Ferguson

* In absence

University of Cambridge

The title of the degrees of M B , B Chir has been conferred on Mrs K Ferguson of Newnham College

Society of Apothecaries of London

G K Coombes, King's Coll and West Lond and J A Dodds, Manc having completed the final examination, are granted the diploma of the society entitling them to practise medicine, surgery and midwifery

Medico-Legal Society

A meeting of this society will be held at 26, Portland Place, London, W 1, on Thursday, May 28, at 5 45 P M , when Mr C E A Bedwell will read a paper on Medical Members of the Inns of Court

Royal Society of Arts

On Wednesday, May 20, at 1 45 P M , this society will meet at its house in John Adam Street, Adelphi, London, W C 2, when Prof H D Kay, D Sc , will speak on the future of the milk industry

Society for Relief of Widows and Orphans of Medical Men

The annual general meeting will be held on Wednesday, May 20, at 11, Chandos Street, London, W 1, at 5 P M

Medical Casualties

The deaths of Major R L Frost, M R C S , I M S and Captain P A Narayan, I M S , were announced in a recent casualty list Captain E V Parker, M B Durh , R A M C , and Lieut Colonel J L O'Neill, L R C P I , I M S , have been posted as wounded Major N I McLeod, L M S Nova Scotia, I M S , is reported missing, and Captain J A Glover, M B Camb , R A M C , has also been missing since the fall of Singapore

Royal Medico-Psychological Association

This society will meet on Wednesday, May 20, at the County Offices, Preston, at 10 30 A M , when Mr Thomas Graves, the president, will open a discussion on ear, nose, and throat disease in mental disorder and collaboration in its investigation and treatment Mr H G Bedford Russell, Mr W Stirk Adams, Dr J J Craig, Dr F A Pickworth and Dr H F Fenton will also speak

Royal Society of Medicine

The fellows of this society will meet at 5 P M , on Tuesday, May 19, to nominate officers and council for next year and to ballot for the election to the fellowship At 4 30 P M , on the same day, at the section of psychiatry, Dr Felix Brown will read a paper on the heredity of psychoneuroses On May 21, at 5 P M , at the section of dermatology, Dr Sybil Horner will speak on industrial dermatitis, Dr A D K Peters on dermatitis in filling factories, and Major W J O'Donovan on dermatitis castrensis The section of neurology will meet at 4 30 P M on the same day, when Major Hugh Garland, Mr Norman Dott and Mr Grey Walter will open a discussion on traumatic epilepsy At the section of epidemiology and state medicine on May 22, at 2 30 P M , Dr T F McNair Scott and Dr Paul Beeson will speak on acute myalgia of the neck and shoulders and its possible relation to generalised fibrositis The section of disease in children will hold a joint meeting with the maternity and child-welfare group of the Society of Medical Officers of Health on May 22, at 5 P M , when Dr Alan Moncrieff, Dr C E Field, Dr Nora Wattie and Dr Virginia Saunders Jacob will be the openers in a discussion on the prevention of chronic lung diseases in childhood

Applications for the William Gibson research scholarship for medical women should be sent to the secretary of the society, 1, Wimpole Street, London, W 1, not later than June 1

London School of Dermatology

A course of lectures on skin diseases in war-time is being held at the London Hospital for Diseases of the Skin, Lisle Street, W C 2, on Wednesdays, at 4 30 P M On May 20 Dr William Griffith will speak on eczema, on May 27, Dr R T Brain on psoriasis , on June 3, Mr Henry Corsi on pus coccal and ringworm infections , and on June 10, Dr J E M Wigley on scabies and parasitic infections

Westminster Hospital

A gift of £4000 has been made to this hospital by a former patient to establish the Keystone fund for radium research

EIGHTEEN delegates from non-teaching voluntary hospitals in Lancashire met at the District Infirmary, Ashton under Lyne, to consider the formation of an association which would concern itself with the welfare of the hon medical staffs of these hospitals now and after the war A resolution was passed setting up the Medical Staffs' Association of Non teaching Voluntary Hospitals of Lancashire Further information may be had from the acting temporary hon secretary, Dr Bernard Bowman, District Infirmary, Ashton under Lyne

The Honyman Gillespie lectures which are being held at the London Homœopathic Hospital on Tuesdays will take place at 3 P M

MEMBERS of the public in Germany are now forbidden to give testimonials for proprietary medicines (*Klin Wschr* Feb 21, 1942, p 192)

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export

Appointments

Colonial Medical Service —The following appointments are announced —

BRUCE L G , M B GLASG medical officer, Uganda,
ELLIS JONES D W , M B LPOOL medical officer, Tanganyika,
LAWES, W E , L R C P I medical officer, Kenya ,
SINGLETON A C B , M B ABERD medical officer, Kenya , and
WILKINSON, P B , M B LOND , M R C P district medical officer, Cyprus

Births, Marriages and Deaths

BIRTHS

COLEMAN —On May 2, at Hertford, the wife of Mr Mark Coleman, M S —a son

FISHER —On May 11, in London, the wife of Dr J W Fisher—a daughter

GOOD —On May 8, at Aylesbury, the wife of Lieut Colonel Michael Good R A M C —a son

JAUCH —On May 9, at Grantham, the wife of Mr F Joscelin Jauch, F R C S —a daughter

LERNER —On May 9, in London, the wife of Captain Alec Lerner, R C A M C —a son

PHILP —On May 6, at South Croydon, the wife of Capt R A Philp, R A M C —a daughter

PRATT —On May 7, in London, the wife of Dr J S Pratt—a daughter

WARE —On May 2, at Bury St Edmunds, the wife of Dr H A Ware—a son

WIGRAM —On May 5, at Oxford, the wife of Captain Edmund H L Wigram, R A M C —a son

MARRIAGES

EVANS—FOORD —On May 8, at Speldhurst, Kent, Gwilym Rhys Evans, M B lieutenant R A M C , to Jean Marjorie Foord

WATT—STEWART —On May 9, at Aberdeen, Leslie Watt, M B , captain R A M C , to Freda F Stewart, 2/subaltern A T S

WOOD—SUTCLIFFE —On May 9, in London, Benjamin Stuart Blackford Wood, B M , R A M C , to Elizabeth Cowan Sutcliffe M B

DEATHS

ANDREWS —On May 7, at Iford near Lewes, Henry Russell Andrews M D LOND , F R C P , F R C O G , aged 70

CHAFFEY —On May 8, at Hove, Wayland Charles Chaffey, M D LOND , aged 86

COUPER —On May 5 Samuel Barrett Couper, B A CAMB , M R C S , of Blaby Leicestershire

FITCH —On May 11 Laurence Percival Fitch M R C S aged 34

FOY —On May 9, at Crawley Down, Sussex, Harry Andrew Foy, M R C P F , D T M & H , D P H

GRIMSDALE —On May 5 at Hindhead Harold Barr Grimsdale, M B CAMB , F R C S , formerly of Cambridge Gate London

SPURRELL —On May 9 at Banningham Aylsham, Norfolk, William Dewing Spurrell M R C S , aged 76

WARD —On May 3, at Calmpton, near Brixham, Thomas Hamilton Ward M D EDIN , aged 76

WEBB —On April 17, Charles Alfred Webb, M R C S , D I H , colonel late R A M C retd aged 84

MINIATURE MASS RADIOGRAPHY IN THE RAF

REVIEW OF 20,000 EXAMINATIONS

R R TRAIL, M C , M D ABERD , F R C P
YSICIAN TO THE ROYAL CHEST HOSPITAL, LONDON, AND SURGICAL UNIT, PAPWORTH , WING COMMANDER, RAFVR

In November, 1941, the Royal Air Force began the amination of personnel by miniature radiography he results now under review are in 20,000 men Allied rsonnel are not included It is hoped at an early date publish a comparative study of young women in the AAF

EQUIPMENT

Two types of equipment are being used The first is ne loaned to the RAF by the British Red Cross It nsists of a Solus four-valve transformer unit, exciting rotating anode 'Dynamax' tube The fluorescent reen is of the Levy West type protected on the side ext to the camera by lead glass A special camera, esigned by Newman, with an F 1 5 'Xenon' lens, is set t 36 in from the screen at the apex of a light-proof unnel The film is moved by hand after each exposure fixed fluoroscopic focused grid of the Schonander type, nade by Solus, is placed between the patient and the luorescent screen Exposure factors are as follows 00 mA, 80–90 kV, exposure 0 25 to 0 5 sec

Equipment of the other type is a gift of the American Red Cross Each set arrived in a van, in which it can e used, for a small power plant to energise the equipment s supplied All units but one, however, have been made tatic The set consists of a Westinghouse condenser ischarge unit, exciting a Machlett stationary anode tube There are two one-quarter microfarad condensers charged by a 30 mA, half-wave rectifier The fluorescent screen is a Patterson type B, protected on the side next to the camera by lead glass A special camera, designed by Kodak Ltd , in conjunction with RAF technicians, with an F 1 5 'Sonnar' lens, is set at 36 in from the screen at the apex of a light-proof tunnel The film is moved by hand after each exposure The tube has a focal spot of 4 2 mm and is placed 42 in from the screen, the movements of tube and screen being coordinated, and controlled by a hand wheel operated at the screen end

The film used in the examinations is Kodak 'Flurodak,' developed for eight minutes at 65° F in Johnson's standard developer

CONDENSER AND VALVE RECTIFIER COMPARED

How does the condenser unit compare with the output of the more usual English form of valve-rectified equipment? The mA seconds used by the condenser discharge unit are half the kV peak (for one-half microfarad capacity) The peak used varies between 70 and 90 In comparing exposure values of the two units it should be borne in mind that the relative distribution of energies supplied by the two types of equipment is very different The condenser discharge film is not nearly so flat or so lacking in contrast as would be a film taken at the same kV peak on standard equipment On the other hand, one mA second in condenser discharge work has not the "film-blackening" power of one mA second from good rectified equipment The film of the condenser unit is more comparable with one taken by standard equipment under the same or slightly lower mA seconds, but at a kV peak from 5 to 10 lower The milliamperage used is approximately 100, and while the discharge time of the condensers may be under 0 5 sec , the radically different nature of the energy supplied must be taken into account As the discharge takes place the kV peak declines, and after 0 2 sec is so low that it no longer contributes effectively to the density of the film Effective exposure values are therefore quite short, under 0 2 sec The resulting film has good contrast and shows no motion In judging kV, for both types of equipment, muscular development as assessed by a trained radiographer has been found to be definitely superior to chest measurement It is interesting to note the relative proportion of large films taken, for all purposes, on 5000 miniatures four valve unit 2 1%, condenser unit 2 5%

Neither type of unit is perfect In the Westinghouse unit condensers of larger capacity, up to one microfarad would be a decided advantage With the present Westinghouse unit it would require two films, anteroposterior and posteroanterior, to challenge comparison with the single film of the four-valve unit The reading of chest films, particularly miniature films, is of course a matter of training and experience Eventually results must stand or fall on the team work of the unit

THE CLINICAL UNIT IN ACTION

Each unit consists of one medical officer, and at least seven other ranks, including a trained radiographer, two photographers, two clerks, a positioner and a marshaller Smooth and efficient working is attained with round 100 examinations per hour The first unit was trained on over 1000 examinations (not under review here) Each successive team has been trained at one particular centre In addition, to attain uniformity, each medical officer, chosen for his knowledge of chest work, has had a course of special instruction at headquarters This covers a scheme of physical examination and film reading on all normalities and abnormalities likely to be encountered, with practical application on hospital and unit patients

From the first it was agreed that the miniature film reaches the limits of its usefulness in showing a variation from the normal which requires further investigation, clinical and pathological To each unit therefore a number of observation beds were allocated in the nearest sick-quarters, with equipment to carry out large film examinations, sedimentation-rates and sputum tests Exercise tests on pulse and temperature are made on every case under observation Finally, every film of doubtful interpretation is sent with full particulars of history and investigations to headquarters unit Where there is still doubt the patient is taken off all training entailing fatigue and is seen regularly for complete re-examination at intervals not beyond eight weeks, until a final decision can be reached The results here set out are built on an interpretation made as generous as possible , no case is considered tuberculous unless it has satisfied the criteria laid down and leaves no reasonable doubt of the diagnosis

RESULTS

The results may conveniently be set out in tabular form, classified in age-groups

NUMBERS SHOWING X-RAY EVIDENCE OF PULMONARY TUBERCULOSIS

Age	Under 20	20–24	25–29	30–34	35 & over	Totals
Number examined	8984	6631	2545	1467	342	19,969
Active	24	21	4	3	2	54 (0 27%)
Inactive	11	24	21	10	1	67 (0 33%)
Total	35 (0 40%)	45 (0 68%)	25 (0 98%)	13 (0 89%)	3 (0 87%)	121 (0 60%)

Sputum examination in cases considered active TB+ 17 (31 5%), TB− 30 (55 5%), no sputum 7 (13%) Of these 54 cases 25 had moderately advanced or advanced disease In addition the films showed calcified nodules, calcified glands, or both in 168 cases (0 84%)

Total evidence of tuberculous infection = 121 + 168 = 289 (1 45%)

It will be noted that 31 (0 15%) are missing This means that before being posted to another station these personnel had not been called back for one of the following examinations repeat of small film, large film, or clinical examination Most of the 31 cases occurred in the first four weeks of working , of the last 5000 examinations, only one is missing

No conclusions can be drawn from the apparent incidence in the age-groups above 30, and little from the age-group 25–29 This will, it is hoped, be amended by the fast growing numbers of examinations at new units Six cases are under observation on the routine outlined above Cases of lung abnormalities outside tuberculosis number 100 Of these, 46 had evidence of thickened pleura in one costophrenic angle, considered to be the result of previous inflammatory conditions only, they had no evidence of parenchymatous lesions, such as calcified foci or fibrosis The remaining 54 showed various conditions such as unresolved pneumonia and bronchopneumonia Azygos lobe was seen in 21, and abnormalities of rib formation in 18

A recent leading article in the *Lancet* (March 7, p 297) stated that " at present there is general agreement that interpretation is at least ten per cent more accurate with full-size films - " The experience reviewed here does not entitle us to comment on the point beyond stating that in almost all miniature films showing lung abnormalities the contrast has been greater than that seen on the following large film This does not imply that every abnormality has been found, nor that passing any individual before an X-ray machine increases his immunity or his resistance to future disease It does mean that a number of lung abnormalities, including in particular pulmonary tuberculosis, have been discovered in individuals who, up to the time of taking the miniature film, made no complaint of symptoms, and had not been discovered by ordinary routine medical examination

My thanks are due to the officers in charge of units for their coöperation, to Wing Commander J F Bromley for assistance on technical points, and to Squadron Leader H J Trenchard for help in the preparation of files and statistics

CHRONIC NASAL DIPHTHERIA CARRIERS

CURE WITH SULPHANILAMIDE[1]

JOAN M BOISSARD, M R C S R M FRY, M R C S

(*Emergency Public Health Laboratory, Carmarthen*)

IN a previous paper[2] we briefly surveyed the results obtained from examination of nose and throat swabs from diphtheria patients and their contacts in Carmarthenshire and Pembrokeshire over about 6 months, from the end of June, 1940. This survey showed that nasal *infection with hæmolytic streptococci* was very common in cases of diphtheria, especially nasal diphtheria, and the influence of such streptococcal infections on the length of stay in hospital of diphtheria patients was analysed From the results, we formed the opinion that *hæmolytic streptococcal infections of the nose* in cases of nasal diphtheria materially prolong the period of carrying.

Similar data have now been collected over a further 11 months from four hospitals in the same area The number of patients discharged, exclusive of deaths, during this period is 399 Of these discharged cases, we have discarded 11 on the following grounds 5 cases were discharged for isolation at home while still carrying *Corynebacterium diphtheriæ*, in 5 cases the records are incomplete, and 1 case remained in hospital for several months with negative swabs, purely because of diphtheritic paralyses The remaining 388 patients were all discharged as soon as they had achieved three consecutive nose and throat swabs negative for *C diphtheriæ* All swabs were cultured on Hoyle's laked blood tellurite agar for *C diphtheriæ*, and on blood agar for hæmolytic streptococci In all new patients the type of diphtheria was confirmed by fermentation reactions and by growth in broth and on blood agar All strains of hæmolytic streptococci were grouped The majority belonged to group A, and the remainder mostly to group C with a few group G

As in the previous paper, these 388 cases have been divided into two groups

Group 1—Patients who showed two or more consecutive diphtheria positive nasal swabs, with hæmolytic streptococci (++ or more)[3] in the nose

Group 2—All other patients

In table I the numbers in each of these groups and the average length of stay in hospital are shown Group 2 has been further split into sub-groups *a* and *b* Group 2*a* consists of all those showing at least two consecutive diphtheria-positive nasal swabs, but without a heavy nasal streptococcal infection (i e, none or less than ++) Group 2*b* contains all patients who did not show two consecutive diphtheria-positive nasal swabs

TABLE I—AVERAGE LENGTH OF STAY IN HOSPITAL OF DIPHTHERIA PATIENTS GROUP 1, PATIENTS WITH A HEAVY NASAL INFECTION WITH HÆMOLYTIC STREPTOCOCCI COMBINED WITH *C diphtheriæ* GROUP 2, ALL OTHER PATIENTS

Group or subgroup	1	2	*2a*	*2b*
Cases	117	271	*45*	*2?5*
Average days in hospital	87 5	42 7	*51*	*41 5*

In the previous paper, of 106 patients who had completed their stay in hospital, 27 belonged to group 1, and their average stay in hospital was 9 7 weeks (68 days) For the 79 group 2 cases it was 5 2 weeks (36 days) It is seen from table I that the average stay in hospital for all patients shows an increase, from 68 to 87 5 days for group 1, and from 36 to 42 7 days for group 2 The ratio between the two groups is, however, the same, about 2 to 1

The general increase in the average stay in hospital is inevitable, as the first series was taken over a relatively short period, and could therefore only include cases whose stay was very long if they were admitted near the beginning of the period In the present series, a longer time has been studied, and in addition patients have been included who began their stay in hospital during the last few months of the period considered in the previous paper

These figures confirm our previous opinion that hæmolytic streptococcal infections of the nose in cases of nasal diphtheria[4] materially prolong the period of carrying This effect can be seen in more detail when the rates of discharge of the two groups of cases are considered In fig 1, the percentage of patients of each group in hospital at the end of 10-day periods has been plotted It is seen that the two curves diverge rapidly between 20 and 50 days At 50 days only 20% of the group 1 cases, compared with 75% of group 2, have been discharged In other words the odds are 3 to 1 *in favour* of a group 2 child being discharged by the 50th day, and 4 to 1 *against* such a happy event for a group 1 child

Hartley and Martin[5] published a series of observations on 457 patients suffering from faucial diphtheria, showing the rate at which the throats became negative If their results are plotted in fig 1, they produce a curve almost exactly parallel to the curve for group 2 cases, but lying 20 days to the left They took, as the date of clearance, half-way between the last positive and the first of three successive negative weekly swabs, whereas we have plotted the time of discharge from hospital, which usually occurred about 20 days after their estimated date of clearance This close correspondence between sets of figures collected at times 20 years apart was so striking that it seemed worth while analysing our data again, using their criterion for clearance The results are shown in fig 2, the logarithms of the percentages carrying on any given day, instead of the percentages themselves, have been used as ordinates On such a chart, if the rates of clearance follow the laws described by Hartley and Martin, the curves should be straight lines, and it is seen that the three sets of observa-

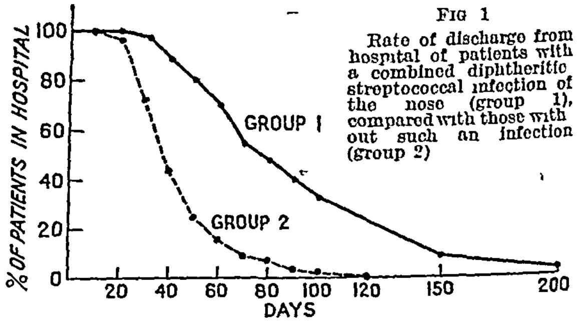


FIG 1
Rate of discharge from hospital of patients with a combined diphtheritic streptococcal infection of the nose (group 1), compared with those without such an infection (group 2)

---

[1] A report to the Medical Research Council

[2] Boissard and Fry, *Publ Hlth Lond* 1941, 54 105

[3] The number of colonies of hæmolytic streptococci on the blood agar plate has always been assessed in this laboratory on the following arbitrary scale ±, a few, +, moderate number, ++, numerous, +++, profuse, ++++, very profuse, nearly pure culture

[4] It must be clearly understood that by " nasal diphtheria " we merely mean the presence of *C diphtheriæ* in the nose, we are not using the term in the generally accepted clinical sense Almost all our group 1 cases were admitted on account of a faucial infection

[5] Hartley, P and Martin, C J *Proc R Soc Med* 1920, 13 (Sect Epidem), 277

tions plotted all lie very nearly on the three lines These lines have been calculated by the method of least squares to fit the observations, using the formula used by Hartley and Martin .

$$\log y = \log x - Kt$$

when y is the number carrying on any given day, x is the number carrying on the day from which the time is reckoned and t is the time in days K is a constant which determines the slope of the line and therefore expresses the rate of clearance, the larger values of K indicating a more rapid clearance Line A, starting from the 5th day, shows the clearance rate for our 271 group 2 patients The value of K for this line is 0 02, very close to the value of 0 0218 obtained by Hartley and Martin This figure of 0 02 indicates a daily decrease of positive patients of about 4¼% Line B gives the results for the 117 group 1 patients, and here the time has been reckoned from the 20th day, since very few were clear before then The observations fit the line well up to 100 days, and the value of K for this line is 0 0083, indicating a daily decrease of just under 2% After 100 days there is a rapid falling away of the observations from the line This may be due in part to the small total number of cases left Another possible explanation and the significance of line C will be dealt with in the discussion

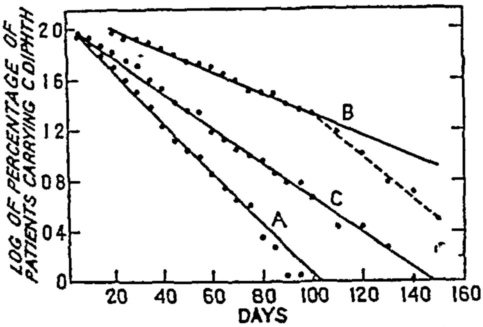


FIG 2—Rate of clearance for *C diphtheriæ* The logarithms of the percentage of patients carrying have been plotted at 5 day intervals up to 100 days, and after that at 10-day intervals Line A, group 2 patients Line B, group 1 patients Line C, group 1 patients, clearance estimated on results of throat swabs only

TREATMENT WITH SULPHANILAMIDE

In January, 1941, we were so impressed with the influence of the concurrent streptococcal infection that we began to feel that the reasonable approach to the problem of the nasal carrier lay in dealing with his hæmolytic streptococci At about this time we had been getting excellent results in the treatment of streptococcal impetigo with local applications of sulphanilamide powder, 5 cases of mixed *C diphtheriæ* and hæmolytic streptococcal infection of the skin responded equally well These results encouraged us to try intranasal sulphanilamide on two long-standing carriers (one 11 months positive and the other 5 months positive) who were being isolated at home These patients attended a child-welfare clinic once a day for a fortnight, Saturdays and Sundays excepted At each visit both nostrils were insufflated with sulphanilamide powder Swabs were taken once in each week and 10 days after the last insufflation Both children became negative for *C diphtheriæ* and hæmolytic streptococci, and remained negative for the further 4 weeks during which they were regularly swabbed

We then decided to treat long-standing nasal cases in hospital, where the conditions were more uniform and the treatment could be more easily supervised. One small ward was set aside for the purpose, and one sister placed in charge She was responsible for carrying out the treatment and for taking all the swabs during and after treatment Each child had each nostril insufflated with sulphanilamide powder morning and evening All those old enough to cooperate were also given a supply of the powder to use as a snuff, with instructions to take it at frequent intervals, especially after blowing the nose Younger children had the snuff administered to them Treatment was carried out for eight days, swabs being taken on the 2nd, 4th and 6th days Insufflations were then stopped, and all surplus snuff carefully collected and locked up (This was found to be a point of great importance among the older children, who showed a remarkable enthusiasm for the treatment) Swabs were taken on the 2nd, 4th and 6th days of the following " rest " week. If these were negative the patient was discharged, and weekly follow-up swabs were obtained for a month or more, wherever possible

A simple form of insufflator which we have used is shown in fig 3 This consists of a glass tube 3 in × 1 in, such as is used for the collection of sputum Two bent glass tubes pass through the cork The outlet tube B ends just below the cork, and the inlet tube A is drawn out to form a small orifice just above the level of the powder A rubber bulb with valve (a Higginson's syringe serves quite well) is attached to A, and air is thus blown in a fine stream on to the surface of the powder For use, a number of lengths of soft rubber tubing about 6 in long are needed for attaching to tube B, the free end being passed well up the nostril In practice we found two rubber tubes were needed for each patient, one for the morning and one for the evening insufflation After use they are boiled and dried thoroughly in a warm place This is extremely important because hardly any powder gets through a damp tube This insufflator, which can be made in a few minutes for a few pence, is light and easy to handle and, provided the tubes are dry, is absolutely foolproof It is moreover very economical

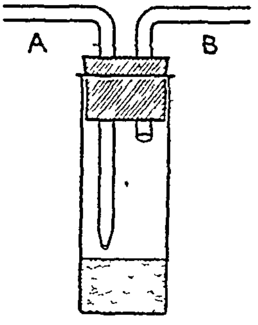


FIG 3—Simple form of insufflator for use with sulphanilamide powder

Twenty-six children were treated in this way in five batches The details of these are shown in table II It will be seen from this table that 23 children were cured completely after one course of treatment In case 12, *C diphtheriæ* reappeared in the nose during the " rest " week, a second course of treatment effected a permanent cure Cases 21 and 26 were admitted with scarlet fever and acquired a diphtheritic infection in hospital In one

TABLE II—PARTICULARS OF THE 26 CASES TREATED IN HOSPITAL

Case no	Nature of illness	Days positive before treatment	Number of courses	Result	Weeks followed after discharge	Notes
1	Case	158	1	Cure	7	—
2	,,	146	1	,,	NT	Scarlet fever and diphtheria concurrently
3	,,	137	1	,,	1	—
4	,,	125	1	,,	6	—
5	,,	121	1	,,	6*	—
6	,,	115	1	,,	4	—
7	,,	113	1	,,	7	—
8	,,	112	1	,,	4	—
9	Carrier	109	1	,,	8	Previous history of 5 wks nasal discharge Brother and sister both infected
10	Case	105	1	,,	6	Bilateral otitis with hæmolytic strep and KLB also cured
11	,,	102	1	,,	1	Further swabs refused.
12	,,	100	2	,,	7	—
13	,,	92	1	,,	3	—
14	,,	88	1	,,	4	—
15	Carrier	87	1	,,	3	Brother of case 13
16	Case	78	1	,,	4	—
17	,,	75	1	,,	2	Further swabs refused
18	,,	73	1	,,	8†	—
19	Carrier	71	1	,,	NT	Scarlet, diphtheria acquired in hospital
20	Case	62	1	,,	4	—
21	Carrier	56	1	Nasal cure	HO‡	Scarlet, diphtheria acquired in hosp Contd carrying in throat for 5 months more
22	Case	50	1	Cure	NT	—
23	Carrier	50	1	,,	8†	Contact of cases 22 and 24
24	Case	50	1	,,	NT	—
25	Carrier	31	1	,,	4	Scarlet, diphtheria acquired in hospital
26	,,	26	2	Nasal cure	NT	Scarlet, diphtheria acquired in hosp Throat cleared after third course

NT = Not traced. * Two swabs at 5 and 6 weeks † Single swab 8 weeks after discharge ‡ HO Swabbed in hospital for 5 months of these (case 21) the nasal infection cleared up permanently after the first course of treatment, but he continued to carry *C diphtheriæ* and hæmolytic streptococci in the throat for a further 5 months in spite of energetic treatment In the other (case 26), both organisms returned in the nose during the first “ rest ” week, as in case 12, but this infection was permanently cured by the second course of treatment , his throat was still positive, but became negative after a third course

Every effort was made to obtain weekly nose and throat swabs for at least a month after discharge from hospital In 5 cases the children left our area and could not be traced, and in 2 cases the parents refused permission for further swabbing after the first time

In table III the detailed bacteriological history of 4 of the cases is set out These have been selected as examples of children whose stay in hospital was less than, equal to and more than the average as given in table I for such cases Figs 4 and 5 show in diagrammatic form the details of the nasal infection for all the 26 cases, but here for simplicity no attempt has been made to show the severity of the hæmolytic streptococcal infection

DISCUSSION

In this paper we are concerned with three aspects of diphtheria infection—the unusually protracted course run by nearly a third of the cases admitted to hospital, the reason for this and the cure

Normal patient —Of our 388 patients, over 95% had faucial diphtheria on admission, and more than a third showed a positive nasal swab at the first or second swabbing Some cases acquired a nasal infection later, often as a cross-infection, but where *C diphtheriæ* was the only pathogen present in the nose the time of acquiring the infection appeared to be of no importance, since with few exceptions the infections soon disappeared The average stay in hospital for these cases (table I, group 2*a*) is little longer than the average time for the cases without a nasal infection (group 2*b*) In group 2 as a whole the diphtheritic infection followed the usual course, with the first of three successive pairs of negative swabs occurring between the 2nd and 4th weeks, and discharge between the 4th and 6th weeks A very few patients continued carrying *C diphtheriæ* in the throat alone for many weeks, and 8 such chronic carriers were treated with sulphanilamide powder, both as an intranasal snuff and by direct application to the tonsils The results were uniformly disappointing, mainly, we think, because of the difficulty of keeping the powder continually applied to the tonsil, a point of particular importance if, as seems probable, it is the tonsillar crypts which are the seat of infection These 8 cases gave us the impression that sulphanilamide powder, as used by us, was of no value in the treatment of chronic tonsillar infections

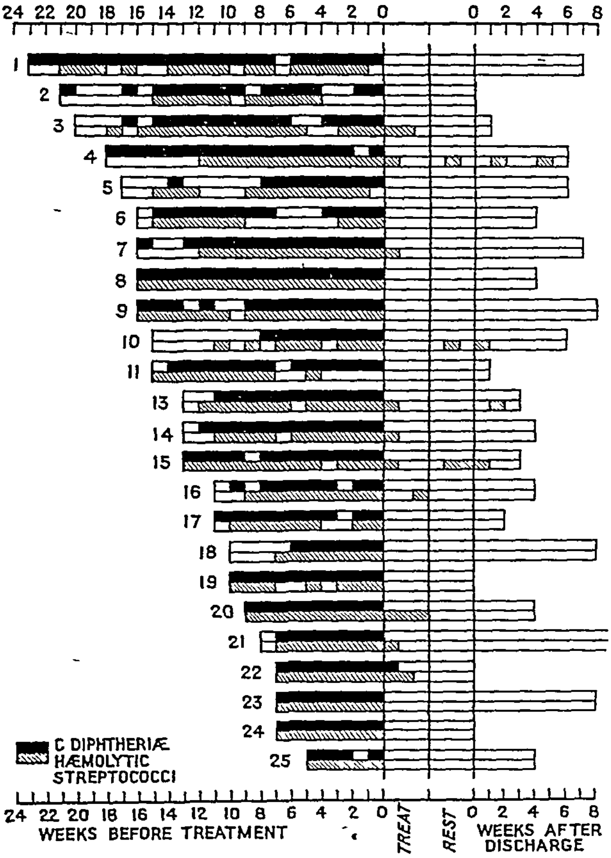


FIG 4 —Showing the presence of *C diphtheriæ* and hæmolytic streptococci in the nose only for the 24 treated patients who showed a nasal cure after one week of treatment The case numbers are the same as in table II

Each record begins at the time the patient first showed *C diphtheriæ* in the nose *or* throat, and many of these nasal records are therefore negative at the beginning For case 21 the record is left open at the end He remained in hospital for 5 months as a throat carrier during which time his nose was consistently negative for *C diphtheriæ* and hæmolytic streptococci

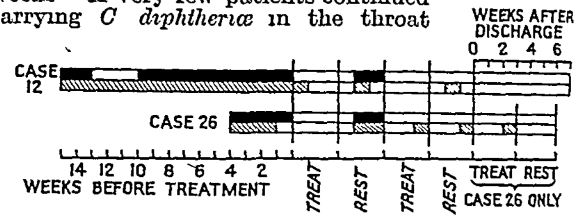


FIG 5 —Showing the presence of *C diphtheriæ* and hæmolytic streptococci in the nose only, for cases 12 and 26 Both these showed a recurrence of nasal infection during the first “ rest ” week, which was cured after a second week of treatment Case 26 received a third week of treatment for his throat

Streptococcal case —In contrast to the history outlined for group 2 is the story of the 117 patients in group 1 Many of these patients were admitted with a double diphtheritic-streptococcal infection in the nose (see table III, cases 8 and 20), but in the majority the streptococcal infection of the nose occurred in hospital (see table III, cases 4 and 14). No matter when the double infection appeared in the nose, it tended, from that time, to persist In the 91 untreated cases, the streptococcal infection gradually decreased, as judged by the number of colonies isolated from successive nasal swabs. Finally it disappeared, and in 75 of the cases the diphtheritic infection disappeared either at the same time or within the next fortnight In the 16 exceptions the diphtheria infection either cleared up while the streptococcal infection persisted or persisted for more than 14 days

While the nasal infections in this group were characterised by an almost unbroken series of diphtheria-positive swabs, the throat swabs showed very erratic results No less than 87 of the 91 patients showed positive throat swabs, often many, usually scattered irregularly through the period of nasal carrying There were only two features common to most One was the appearance of a negative interval separating the positive swabs occurring in the first or second weeks of the disease from subsequent ones When, as often happened, a cross-infection with a different type of *C diphtheriæ* occurred in the nose, it was invariably found that the type isolated from the throat after the negative interval was also altered Examples of this in the treated cases are shown in table III, cases 4 and 14 The other common feature was the disappearance of positive throat swabs before, or at the time of, the last positive nasal swab In only 8 cases was *C diphtheriæ* isolated from the throat after the nasal infection had cleared up, and then only for a short time

Though we had made these observations we were unable to account for them, since similar results were obtained from four different hospitals which seemed to rule out the possibility of any systematic error The results of treatment provide a possible explanation In 12 of the 26 treated cases positive throat swabs were found up to the time treatment began, but in only 2 did they persist in spite of treatment These exceptions, cases 21 and 26, were patients with enlarged unhealthy tonsils who had been admitted to hospital with scarlet fever and acquired a diphtheritic infection in the third week In both we achieved our object in treatment by clearing up the nasal infection, but the tonsillar infections remained unaffected, in one case for many months This was in agreement with the failures mentioned above in 8 cases of tonsillar infection alone The unexpected

TABLE III—DETAILED BACTERIOLOGICAL HISTORY OF 4 TYPICAL TREATED PATIENTS, SHOWING RESULTS OF BOTH NASAL ND FAUCIAL SWABS All swabs are at weekly intervals except the first two of case 4, which are separated by 5 weeks, and ose during and immediately after treatment which are at two day intervals Type of *C diphtheriæ* (KLB) shown thus = intermedius, G = gravis, HS = hæmolytic streptococcus

CASE 4

Nose				Throat			
KLB	Type	HS	Group	KLB	Type	HS	Group
+	I	−		+	I	−	
+	I	+	A	−		−	
+	I	±	A	−		++	A
+	G	+	A	+	G	−	
+	G	+++	A	+	G	−	
+	I	++	A	+	I	+++	A
+	G	+++	A	+	G	++	A
+	G	+++	A	+	G	++	A
+	G	+++	A	+	G	+++	A
+	G	++	A	−		+	A
+	G	+++	A	+	G	++	A
−		+++	A	−		+	A
+	I	++	A	−		+	C
Tr begins							
−		++	A	−		+	C
−		−		−		+	C
−		−		−		+	C
Tr ends							
−		−		−		−	
−		+	C	−		+	C
−		−		−		+	C
Disch							
−		−		−		+	C
−		+	C	−		++	C
−		−		−		−	
−		−		−		+	C
−		+	C	−		+++	C
−		−		−		+	C

CASE 14

Nose				Throat			
KLB	Type	HS	Group	KLB	Type	HS	Group
−		−		+	G	+	A
+	G	−		−		−	
+	GI	+	A	−		−	
+	GI	++	A	−		+	A
+	I	+++	A	−		−	
+	I	++	A	+	I	−	
+	I	−		+	I	+++	A
+	I	++	A	−		−	
+	I	+	A	−		−	
+	I	+++	A	−		−	
+	I	+++	A	−		−	
+	I	+++	A	−		−	
+	I	+++	A	−		−	
Tr begins							
−		+	A	−		−	
−		−		−		−	
−		−		−		−	
Tr ends							
−		−		−		−	
−		−		−		−	
−		−		−		−	
Disch							
−		−		−		+	A
−		−		−		−	
−		−		−		−	
−		−		−		−	

CASE 8

Nose				Throat			
KLB	Type	HS	Group	KLB	Type	HS	Group
+	I	++	A	+	I	−	
+	I	++++	A	+	I	++	A
+	I	++++	A	+	I	++	A
+	I	++++	A	+	I	+++	A
+	I	+++	A	+	I	+	A
+	I	++++	A	+	I	+++	A
+	I	++++	A	−		+++	A
+	I	++	A	−		+	C
+	I	+++	A	−		+	C
+	I	+	A	−		−	
+	I	+	A	−		+	C
+	I	+++	A	−		−	
+	I	+	A	−		−	
+	I	++	A	−		−	
+	I	+	A	−		+	A
+	I	+	A	−		+	C
Tr begins							
−		−		−		+	C
−		−		−		++	C
−		−		−		++	C
Tr ends							
−		−		−		+	C
−		−		−		+	C
−		−		−		+ +	C
Disch							
−		−		−		+	C
−		−		−		+	C
−		−		−		−	
−		−		−		−	

CASE 20

Nose				Throat			
KLB	Type	HS	Group	KLB	Type	HS	Group
+	I	++	A	+	I	++	G
+	I	++	A	+	I	+	G
+	I	+	A	+	I	+++	G
+	I	+++	A	+	I	++	G
+	I	+	A	−		++	G
+	I	+++	A	+	I	++	A
+	I	+++	A	+	I	++	A
+	I	+++	A	−		++	A
+	I	+++	A	+	I	++	A
Tr begins							
−		+++	A	+	I	++	A
−		++	A	−		−	
−		+	A	−		−	
Tr ends							
−		−		−		+++	A
−		−		−		−	
−		−		−		+++	A
Disch							
−		−		−		+++	AG
−		−		−		++	A
−		−		−		+	G
−		−		−		++	AG

Tr = treatment
Disch = discharged from hospital

results in the other 10 patients, where the throat swabs became negative at the same time as the nasal swabs, suggest strongly that the presence of *C diphtheriæ* in the throat in these cases did not, at this time, indicate a true faucial infection. If there had in fact been such an infection, it is highly improbable, judging by our previous failure with throat carriers, that all 10 would have responded immediately, and it is equally improbable that in every case treatment would have coincided with a spontaneous cure The probable explanation of the results in these 10 cases is that the tonsils were bathed by a postnasal discharge The frequency with which they would be contaminated would depend on the location of the lesion, the amount of discharge and the presence or absence of obstruction of the anterior nares Positive tonsillar swabs would therefore to a great extent be a matter of chance It is precisely this element of chance which is characteristic of the distribution of positive throat swabs in the other cases in this group, and the same mechanism would explain the observed results This raises the possibility that an infection persisting in the nose might be regarded as persisting in the throat unless both nose and throat swabs are regularly examined, and it may provide one explanation of the great difference in the rates of clearance found by different workers Since group 1 cases remain in hospital for twice as long as group 2, it is clear that the inclusion of a number of these in group 2 would greatly reduce the rate of clearance, with a consequent reduction in the value of the constant K in the formula used by Hartley and Martin

This reduction in the rate of clearance would not be as great as might be expected from fig 1, since the slow clearance-rate for group 1 cases is mainly due to their nasal infection In fig 2, line C has been calculated for these cases on the results of their throat swabs alone, disregarding their nasal results Six patients who never showed a positive throat swab have been omitted For the remaining 111 the time of clearance has been taken as the first occasion on which they showed three consecutive negative swabs at weekly intervals, the actual date of clearance being reckoned as for the other lines Such a negative period was often succeeded by positive swabs, but these have been disregarded in calculating line C since, on throat swabs alone, the patients would not have remained long enough in hospital for these later positive results to have been observed The rate of clearance, as shown by the slope of line C, is greater than for line B, and the value of K is 0 014, indicating a daily decrease of about 3¼% This clearance rate, besides being greater than for line B, starts much earlier, at the 5th instead of the 20th day Both these factors bring the line closer to that for the group 2 cases (line A), but there still remains a considerable difference in the rates of clearance indicated by the two lines—4¾% per day for group 2 and 3¼% per day for group 1, even when "cleared" on throat swabs alone (line C) Since inclusion in group 1 depends solely on the presence of the double nasal infection, irrespective of what may be in the throat, this difference between the lines suggests that positive throat swabs in group 1 patients are often dependent on this nasal infection, and supports our hypothesis that they may be directly derived from it

It has already been seen that in fig 2 the observed clearance rate for group 1 patients rapidly falls away from line B after 100 days, yet when data for these same patients are analysed on the results of throat swabs only, they show a fairly close agreement with line C up to 150 days The small number of patients left towards the end of the line may be a partial explanation, but another factor is probably the inclusion of our 26 treated cases in this group These were all patients with very severe persistent streptococcal infections and were therefore, according to our experience, likely to be most persistent carriers, and were chosen for treatment on these grounds Fourteen of these had stopped carrying before 100 days, as a result of treatment, and may reasonably be regarded as artificial cures, increasing the apparent rate of clearance How many of them would have continued to carry past the 100th day cannot be estimated with accuracy, but, on the average clearance rate given by line B of about 2% per day, at least 3 of the 14 should have carried over 100 days Since these were selected severe cases, this is only a lower limit and the actual figure is probably higher Such cases, if they had not been treated, must have influenced the slope of line B That this same effect is not seen in line C is probably due to the fact that most of the 26 treated cases would have been passed as spontaneous cures on the throat swabs alone long before the beginning of treatment The effect of the treated cases would be expected to show mainly towards the end of line B, since most of them (19 out of 26) did not start treatment until after the 70th day It seems probable therefore that this line shows approximately the normal clearance rate for group 1 cases, and that after 100 days the departure of the observations from the line shows the effect of treatment That these later observations lie roughly on another straight line must be a matter of chance, since the time of treatment for the 10 patients artificially cleared during that period was selected at random as opportunity arose

Action of sulphanilamide—This treatment was designed to deal with the streptococcal infection in the nose, and the results were satisfactory Of the 24 cases in fig 4, 10 showed hæmolytic streptococci in the nose during treatment, but only 4 showed a recurrence of the streptococcal infection after treatment The findings in the first of these (case 4) are shown in detail in table III, where it is seen that he had acquired a group C streptococcus in the throat before treatment, and that the nasal infection after treatment was with this group, the group A nasal infection having cleared In two others (cases 13 and 15) there was no such change of group, but a streptococcal infection of the throat persisted during and after treatment and the subsequent temporary nasal infection may have been derived from this In the fourth (case 10) the positive nasal swabs may have indicated a true recurrence of the streptococcal infection or a cross-infection, but they were not derived from the throat Both the children in fig 5 showed a recurrence of the streptococcal infection in the nose In one (case 26) there was an accompanying heavy streptococcal infection of the throat of the same group In the other (case 12) the widely scattered streptococcus-positive nasal swabs may have been recurrences or cross-infections, but were certainly not derived from his own throat, which by that time was showing a group G infection in place of the original group A.

In view of the heaviness of the streptococcal infection before treatment (table III) these results are good, but they are not so startling as the effect of the treatment on the diphtheritic infection Fig 4 shows that in 24 cases the infection came to an abrupt end very early in the week of treatment, and in some cases before the streptococcal infection had cleared up Such a rapid response seems to show that these results were not obtained solely by the removal of the hæmolytic streptococcus as we had expected, but were, in some part at least, due to the direct action of sulphanilamide on *C diphtheriæ* This is further suggested by the results in cases 2 and 11, who both showed a four-week interval free from streptococcal infection before treatment started Both the cases whose nasal infection recurred were cured by a second week of treatment

Sulphanilamide snuff is easy to administer, not unpleasant for the patient, and in our experience free from any toxic effects It can be safely given to ambulant patients on a normal diet We hope that, by its extended use, we shall be able to reduce the stay in hospital of the group 1 cases to half Perhaps even more important than the time wasted in hospital by these children is their liability to develop serious middle-ear infections In our total series of 388 patients there were 16 cases of otitis media showing both hæmolytic streptococci and *C diphtheriæ* in the ear, and 12 of these occurred in patients with a double nasal infection, 4 of them being in our series of treated patients At the time treatment started in these cases only one child (case 10) still had otorrhœa Both ears were insufflated with sulphanilamide powder at the times of the nasal treatment, and in both the double infection cleared up as abruptly and permanently as in the nose We hope that with early snuff treatment the incidence of such infections will be reduced

SUMMARY

The results of swabs from 388 diphtheria patients in hospital have been analysed , 117 of them had a double infection with *C diphtheriæ* and hæmolytic streptococci in the nose, and the average stay in hospital for these cases was 87 5 days, more than twice the average for all cases without such an infection

Sulphanilamide powder was administered intranasally to 26 children with a heavy double nasal infection who had been positive for periods ranging from 4 to 23 weeks In 24 the nasal infection was abruptly and permanently ended by the first 8-day course of treatment In the other 2 this result was achieved by a second course In addition, 2 nasal carriers with a double infection of 11 and 5 months duration were treated outside hospital and cured

It is concluded that the persistence of *C diphtheriæ* in the nose mainly depends on the associated hæmolytic streptococcal infection, which can be cleared up with sulphanilamide powder Some of the results suggest that sulphanilamide also has a direct action on *C. diphtheriæ*

Continued at foot of next column

Continued from previous column

We want to thank Dr Elfyn T Jones, medical officer of health for Carmarthen Borough, for carrying out the treatment of the first two cases at his child welfare clinic, and Miss E M Coward for her enthusiasm in carrying out the treatment of the hospital cases Our thanks are also due to Dr W M Lloyd, county medical officer of health, and his staff for obtaining many of the follow up swabs, and to Dr L W Pole Dr D M Hughes and Dr Morris Price of London, who traced and swabbed some of the discharged cases

---

ORGANIC DISEASES PRESENTING AS PSYCHOLOGICAL DISTURBANCES

N G Hulbert, M D Camb , M R C P
MEDICAL REGISTRAR TO THE WEST END HOSPITAL FOR NERVOUS
DISEASES AND TO THE METROPOLITAN HOSPITAL

This report on a small series of cases seems salutary in view of the present tendency towards a psychological approach to disease Cook and Sargant (1942), for instance, advocate an earlier search for positive evidence of neurosis , and indeed it is a truism that repeated hospitalisation and over-zealous investigation may establish and multiply hysterical symptoms I have seen the following 7 cases since 1939 They presented as psychological disorders, and showed a minimum of physical signs

CASE-HISTORIES

CASE 1 —A man of 53, brought by a relative to the Metropolitan Hospital on Dec 10, 1941 He had a tremulous agitated manner, was irritable and jumpy, and tended to repeat his actions for example, he shut the door several times He was not eating well and had lost weight, falling from 9 st 12 lb to 8 st 11 lb , though he had always been thin There was an irritating cough at night He had been blown up in the war of *1914–18* and invalided out of the Army with neurasthenia On returning home from the front he found that his wife had gone off with another man, and that his infant son had died He gradually improved till the present war, when he volunteered as a shelter warden During air raids he saw many people killed nearby, and was himself shaken by blast from a bomb He had had quite a good income, but two months previously his lawyer had told him that owing to the war it would only be a quarter of the usual sum He never had eaten much, but three weeks before he had begun to refuse food, taking only a little porridge, custard and a piece of bread in the day On examination he was agitated, tremulous, and rather incoherent He had amphoric breathing and crepitations at the left apex , X ray showed extensive pulmonary tuberculosis He died six days after admission to hospital

It seems probable that his original neurasthenia was associated with the beginning of his tuberculosis Neurasthenia is often erroneously diagnosed in pulmonary tuberculosis , and fatigue is a common presenting symptom which was found in 75 out of the 340 cases analysed by Maxwell (1937) at the Royal Chest Hospital On the other hand, there is a particular type of emotional temperament which, when found in pulmonary tuberculosis patients, indicates a poor prognosis, as has been noted by Burrell (1937) Thus in pulmonary tuberculosis while the disease may affect the psychology the converse is also true

CASE 2 —A *man of 48,* admitted to the West End Hospital on May 1, 1941, under Dr C Worster Drought He had been in a prison camp for a long time during the last war, and had been unable to settle down after his release He had been undergoing a long and expensive course of psychotherapy until a short time before admission He had small pupils, reacting to accommodation but not to light, and a little tremor of the tongue , no other abnormal physical signs The cerebrospinal fluid showed 104 cells per c mm of which 93% were small lymphocytes , total protein 60 mg per 100 c cm The Lange gold curve showed a luetic change, and the *Wassermann reaction was strongly* positive both in CSF and blood

In this case, owing to preoccupation with the psychological aspect, a single physical sign was overlooked and so active treatment was delayed

CASE 3 —A man of 51, admitted to the West End Hospital on Feb 13, 1940, under Dr Worster Drought He complained of irritability and changed mentality, inability to concentrate, noises in the head, deafness and headache His wife said he had been normal and affectionate until 5 months before, when he had been run over by a car He was half-conscious on admission to a hospital after this accident, and had a small occipital wound An X ray showed a fissured fracture of the right parietal bone A month later he was considered sufficiently improved to be sent home to remain in bed under the care of his own doctor Three days after returning home he became confused, excitable and ill-tempered He swore, lacked concentration, talked to the birds and trees, and tried to burn the hands of his small grandchild He was therefore sent into another hospital on a three-day mental order After twelve days there his mental condition began to improve and continued to do so until he was discharged to the care of his own doctor a month after this second admission On return home, however, his wife did not consider him much improved, for his habits were dirty and he had little regard for his personal appearance

On admission to the West End Hospital he was completely disoriented for time and place and unable to remember anything for any length of time, but he could read and write, and coöperated in the physical examination There were coarse tremor of the lips and deafness, more on the right side than the left, with poor air conduction and fairly good bone conduction; this was considered to be due to otosclerosis No other abnormal physical signs Blood-pressure 110/80 mm. Hg The CSF showed 75 mg of protein per 100 c cm and a mildly luetic Lange curve the Wassermann reaction was negative in blood and fluid Encephalography showed a gross hydrocephalus with the left ventricle larger than the right, and an increase in the subarachnoid space over the frontal lobes suggesting cortical atrophy There was delay in the urinary excretion of neutral phenol red injected by lumbar puncture A month after admission he showed a decided grasp reflex in the left hand and a mild grasp reflex with the right hand The mental state deteriorated steadily to a dementia, and after three months he was transferred to a mental hospital, where he died Autopsy confirmed the presence of a hydrocephalus secondary to gross cortical atrophy

The gross degree of post-traumatic cerebral atrophy and the fatal issue in this case, together with the absence of physical signs when he was first seen, are a warning against a facile diagnosis of compensation neurosis after head injury; for much less damage might well cause profound personality changes

Case 4 —A woman of 64 seen at the Metropolitan Hospital on Dec 17, 1941 She was depressed, afraid she was going to die, had pains all over the head and body, was unable to sleep, unable to get about and described as difficult by her relatives The history was elicited largely by direct questioning Eighteen years before she began to have pains in the head and for ten years she had fainting attacks at intervals of six months During the last eight years she had been well until three months before admission, when she lost her sight for several hours. A month before being seen she had developed pains in the back and head, and four days before an attack of somnolence lasting for several hours The only abnormal signs were pupils which reacted less briskly to light than to accommodation. Blood-pressure was 155/100 mg Hg Wassermann reaction strongly positive in CSF and blood. CSF contained 53 cells per c.mm, 93% being small lymphocytes, protein 250 mg per 100 c cm, excess of globulin, Lange curve - 0012343210

The gross changes in the CSF in this patient were in contrast to the trifling physical signs, and as Worster-Drought (1940) has stressed, meningovascular syphilis may be readily confused with psychoneurosis

Case 5 —A man of 64, seen at the Metropolitan Hospital on July 31 1941, was depressed, not sleeping at night, and felt exhausted Ten years before he had had an injury to his leg and gave up his work, since when he had been financially dependent on his children and charitable funds Recently he had been bombed out and was living under very difficult conditions; the rain poured into his room, and he had been unable to find another house He had lens opacities and a blood pressure of 210/110 mm Hg; there was gross glycosuria, and his blood sugar curve, after 50 g of glucose, showed a resting level of 240 mg per 100 c cm., 320 mg after half an hour, 360 mg after an hour, 340 mg after 1½ hours, and 300 mg after 2 hours He improved and gained weight on a diet containing 150 g of carbohydrate daily, with 12 units of insulin twice daily

This patient illustrates the need for routine testing of the urine; this had been omitted before he was referred as a case of depression

Case 6 —A woman of 59, admitted to the West End Hospital on Feb 7, 1939, under Dr L R Yealland, with bad memory for recent events, visual hallucinations of a yellow Chinaman, flowers and other articles, heart-burn, flatulence, increasing weight and falling hair Her husband had died 4 years before, since when she had been living entirely alone Two months before her elder son had been lost at sea She was well nourished, rather pale, with a dry skin and loss of hair from the outer third of the eyebrows Her cerebration was slow Blood-pressure 170/110 mm Hg The margins of the optic discs were indistinct Otherwise the physical examination was normal, except for some arthritis of the hands Blood count normal Seven weeks after admission she developed 2 diopters of papillœdema, an X ray of the skull showed increased vascular markings and hyperostosis of the frontal bone Later a large parasagittal meningioma was removed at operation

One of the features of frontal-lobe tumours is the early development of mental symptoms before the appearance of signs of pressure or localising signs This patient was under observation for nearly 2 months before papillœdema developed

Case 7 —A woman of 27, seen at the West End Hospital on Jan 3, 1940 She complained of dragging of the right foot and right arm, and said that she had had two shocks in 1934 and 1936, which she was unwilling to discuss Two years before, her sister had gone to live with her and more recently her mother-in law and sister in law also There had been a good deal of domestic friction during these two years She had had toxæmia of pregnancy with her first child 3½ years before, her second confinement, 7 months before admission, had been normal, but she was afraid of becoming pregnant again One day, before attending the hospital she had had a sudden weakness of the right arm and leg, which had largely passed off On direct questioning, she also admitted loss of vision in the right eye 7 years before, which had lasted for 3 months, and an attack of numbness of the fingers and feet a month before admission. There were no abnormal physical signs, but the CSF showed 9 cells per c.mm, total protein 25 mg per 100 c cm, the faintest detectable trace of globulin; Lange curve. 5554221000 The Wassermann reaction was negative in blood and CSF A year later she showed a partial spastic paraplegia, with a right extensor plantar reflex

Disseminated sclerosis is commonly associated with an alteration in the personality, and the transitory lesions are readily diagnosed as hysterical. In this case, the significant points in the history were only elicited by direct questioning, and the diagnosis, confirmed by the CSF investigation in the absence of physical signs, has been established by the subsequent course of the disease

CONCLUSIONS

In the diagnosis of any case with psychological symptoms we must bear the following possibilities in mind

Disease by direct action on the nervous system may produce a psychological disorder

Disease is of itself a psychological stress, except where it provides an escape from difficulties hypertension, for instance, often gives rise to an anxiety state

It is possible that psychological stress may cause some organic disorders, such as peptic ulceration

Lack of psychological balance may aggravate an organic disorder, such as pulmonary tuberculosis, or exaggerate organic symptoms and signs

Psychological disorders may present physical symptoms and signs, such as hysterical paralyses

Finally, psychological and organic disease may be present independently in the same patient

Hence any full case-history should cover inquiry into psychological stresses, but the patients in this short series illustrate the risk of over-attention to the psychological aspect of an illness.

I wish to thank the medical staffs of the West End Hospital for Nervous Diseases, and of the Metropolitan Hospital for permission to refer to case-notes

REFERENCES

Burrell L S T (1937) Recent Advances in Pulmonary Tuberculosis London
Cook, G T and Sargant W. (1942) *Lancet* i 31
Maxwell J (1937) *Ibid* ii 186
Worster-Drought, C (1940) Neurosyphilis London

BLOOD-TRANSFUSION
FOR OBSTETRIC HÆMORRHAGE AND SHOCK

H L SHEEHAN, M D , D SC MANC , M R C P
DIRECTOR OF RESEARCH, GLASGOW ROYAL MATERNITY HOSPITAL

TRANSFUSION of blood or blood derivatives in conditions of hæmorrhage or shock in ordinary surgical practice is based on a wide range of experimental studies and physiological considerations, and its value is accepted by the consensus of medical opinion (Whitby, Vaughan and Brown 1941, Grant, Hudson, McMichael and Nosworthy 1942) There is, however, little objective evidence of its actual efficacy in saving the lives of patients In making any statistical study of the results of transfusion it is always difficult to obtain adequate control data A surgeon cannot very well withhold transfusion from alternate cases in a large series of patients gravely ill from hæmorrhage or shock. It is therefore necessary to compare the mortality from hæmorrhage and shock in a single hospital at a time when few or no transfusions were given for these conditions with the mortality later when transfusions were being given freely For such a comparison to be valid other potential sources of variation in the mortality must as far as possible be eliminated The numbers of cases and their type and severity should have remained fairly constant, and other lines of treatment should not have been significantly altered These conditions are sufficiently fulfilled in the 12 years 1929–40 at the Glasgow Royal Maternity Hospital During this time, 765 transfusions were given in the hospital for hæmorrhage and shock, and 259 women died during parturition as a result of these conditions The figures, when subdivided into the necessary subgroups, are not large enough to carry great weight statistically, but they are sufficient to justify provisional conclusions The analysis suggests that the efficacy of blood-transfusion in cases of hæmorrhage is well supported, but that its value in shock is doubtful

It may be objected that the findings in " obstetric shock " have little or no bearing on shock in general, but there is little evidence that shock in obstetrics is fundamentally different from shock in surgical trauma There are certainly a few pathological differences—for example, fat-embolism of pulmonary capillaries is not found in obstetric cases—but these hardly detract from the general clinical and pathological similarity (Robb-Smith 1941, Sheehan 1939, 1940) Until more objective evidence is available, it does not appear justifiable to assume that transfusion for shock in obstetrics gives information which is inapplicable to shock in other conditions

OBSTETRIC COMPLICATIONS IN THE TEST PERIODS

The 12 years from 1929–40 are divided here, on the basis of the transfusion arrangements, into four periods of 3 years each The total obstetric admissions to the hospital in each period show little variation The numbers of cases of hæmorrhage and shock admitted to the hospital as a result of each obstetric complication are about the same in each period , what differences there are are small and appear to be due to chance There is no reason to suspect that the severity of the cases has altered Thus the four periods can quite fairly be compared with each other, and the actual numbers of deaths from hæmorrhage and shock in each period can be taken as an inverse measure of the efficacy of the treatment The really important difference in treatment has been the extensive use of transfusions in the last two periods, but there has also been a great improvement during the last two or three periods in the treatment of placenta prævia and some improvement in the treatment of accidental hæmorrhage The reduction of the mortality from these conditions is partly due to this better technique and partly to transfusion , it is not possible to assess the relative importance of the two, and this must be borne in mind when considering the results The puerperal deaths in the hospital are higher in the first period than in later periods, because most patients who developed puerperal sepsis during the last three periods were transferred to a fever hospital , this explains the unevenness of the data about puerperal cases in tables I and V

An analysis has been made of the parturitional deaths from hæmorrhage or shock in each of the four periods The term " parturitional " in this paper is applied to deaths during labour or within 8 hours after delivery, deaths later than that time are classed as puerperal The obstetric conditions which caused these parturitional deaths fall into 6 main groups

Placenta prævia —About 300 patients were admitted to the hospital in each period , hæmorrhage played an important part in causing the deaths

Abortion —About 1400 patients were admitted to hospital in each period, but most of these were not at all ill , long hæmorrhage was a significant factor in causing those few deaths which occurred

Retained placenta and postpartum hæmorrhage —About 300 patients were admitted in each period , death was sometimes due mainly to hæmorrhage but often resulted from shock following attempted or successful removal of the placenta several hours after the baby had been born

Mixed and concealed accidental hæmorrhage, with a pathological basis of uteroplacental apoplexy —About 250 cases were admitted in each period , death was usually due to shock, the retroplacental clot being rarely more than 2 lb in weight, but in a few cases there was fatal postpartum hæmorrhage as a result of atony of the uterus after delivery

Rupture or inversion of the uterus —There were about 25 cases of rupture and 3 of inversion in each period , death was usually due chiefly to shock, though there was very severe external or internal hæmorrhage in a few ruptures as a result of laceration of parametrial vessels

Shock following dystocia or operative deliveries —There were about 2000 or more cases of difficult delivery in each period, but only about 80 of these developed a postpartum collapse Hæmorrhage was usually of little importance in these cases This group is in certain ways different from the previous five, and is dealt with separately at the end of the paper

Some types of parturitional death have been excluded, even when the immediate cause of death was a sudden intrapartum or postpartum collapse These comprise deaths under anæsthesia (except in cases where hæmorrhage or shock was clearly the essential factor and the anæsthetic played no significant part), hyperemesis, eclampsia, hypertensive toxæmia and intrapartum sepsis, and intercurrent conditions such as cardiac disease, anæmia or pneumonia A number of these conditions were only recognised at autopsy, which was made in over three-quarters of all the deaths in the hospital It is not possible to say accurately how many patients in each period had clinical indications for transfusion, but about 500–600 appears to be a reasonable estimate

BLOOD-TRANSFUSIONS IN EACH PERIOD

The only transfusions considered in this paper are of citrated blood given to patients during labour or within 8 hours after delivery, in the treatment of shock or hæmorrhage These actually constitute about 90% of the total transfusions in the hospital, the remainder being given for anæmia or in the puerperium A patient is not classed as transfused if she died in the course of a transfusion before any beneficial effect of the treatment could be expected The amount of blood given varied according to the condition of the patient and the response to the transfusion In some cases only one transfusion of 600 or 800 c cm of blood was given , in other cases three or four transfusions were given with a total of up to 3000 c cm of blood The average volume given was about 1000 c cm Plasma-transfusions have been given to a few patients, but the numbers are not sufficient to allow of any conclusions

The total numbers of transfusions given in each of the four periods are shown in table I It will be seen that, for practical purposes, the first two periods are negative controls, while the third and fourth are periods when transfusions were practised on a large scale There were only about 25 transfusions for hæmorrhage or shock in each of the first two periods 1929–31 and 1932–34 No satisfactory system for transfusions had been organised , on the few occasions when it was decided that a transfusion should be given the relatives had to be sent for and typed before blood could be collected The delay was thus considerable

At about the beginning of the third period, 1935–37, a complete change of policy was made (Black 1937) Blood-transfusion was adopted as a routine treatment for all patients who appeared to need it Credit [illegible] new arrangement is due to several members of the consultant staff and to a series of energetic resident obstetrical officers. A complete blood-transfusion service for the hospital was organised with a panel of 200 donors living in the vicinity. When a patient needed transfusion, her blood was typed and a car was immediately sent for the nearest suitable donor. The patient was given a preliminary intravenous saline and by the time this was completed the donor's blood was usually ready. The time taken to get the donor and collect the blood was usually quite short—often less than an hour—but this delay proved in practice to be the weak point of the system. It will be seen that during the third period 303 transfusions were given (table I). Many seriously ill patients were transfused, as is shown by the fact that only a third of the patients who died in the puerperium had not been transfused at about the time of delivery. But too many desperately ill patients died before transfusion could be given, in two-thirds of the parturitional deaths the patient had not been transfused. At the beginning of the fourth period, 1938–40, the system was altered to close this loophole. Several bottles of stored blood were kept in the refrigerator ready for immediate use in emergency. The blood was generally used within a few days after collection, and was only very rarely more than a week old. The donor service was kept for all the less urgent transfusions and for maintaining the blood-bank. During this fourth period, 368 transfusions were given for cases of hæmorrhage and shock. The greater efficiency of the new system will be seen from table I. In only a quarter of the parturitional deaths had the patient not been transfused, as compared with two-thirds in the previous period. The transfusion of less desperately ill patients continued at about the same rate as before, in about a third of the puerperal deaths the patient had not been transfused at delivery.

TABLE I—TRANSFUSION ARRANGEMENTS IN FOUR 3 YEAR PERIODS

Period	Transfusions	Deaths			
		Parturitional		Puerperal	
		Total	Not transfused	Total	Not transfused
1929–31	About 20	58	56	36	32
1932–34	About 25	54	49	17	16
1935–37	303	39	26	21	7
1938–40	368	40	11	15	5

TABLE II—TRANSFUSIONS GIVEN FOR EACH OF THE FIRST FIVE OBSTETRIC COMPLICATIONS

TABLE III—ANALYSIS OF DEATHS ACCORDING TO OBSTETRIC COMPLICATIONS

	II				III			
Complication	Transfusions given in each period				Parturitional deaths in each period			
	1929–31	1932–34	1935–37	1938–40	1929–31	1932–34	1935–37	1938–40
Placenta prævia	10	11	59	52	15	9	3	4
Abortion	Ab 1	3	74	72	3	5	3	0
Retained placenta and PPH	Ab 5	Ab 7	119	172	21	11	18	17
Accidental hæmorrhage	2	3	36	56	13	20	8	11
Rupture and inversion of uterus	Ab 2	Ab 1	15	16	6	9	7	8
Ab = about.		Total			58	54	39	40

These figures are presented only as a convenient yardstick of the efficiency of the transfusion arrangements. They are of course not a measure of the number of patients whose lives were saved by the transfusions, nor of the number of patients who were actually transfused but would not have died in any case. The distribution of the transfusions among the 5 obstetric complications is shown in table II. More detailed analysis shows that the transfusions were given in approximately the same average number and volume to these patients whether they were suffering mainly from hæmorrhage or mainly from shock.

RESULTS

The parturitional deaths fell from about 56 in each of the first two control periods to about 40 in the third and fourth periods when transfusion was being employed on a large scale. The fall is sufficient to merit analysis both with regard to the particular obstetric condition and to the type of death. Table III shows the deaths arranged according to the obstetric condition. It will be seen that there is a significant reduction in the deaths from placenta prævia and a much less definite reduction in the deaths from accidental hæmorrhage. As pointed out earlier, this improvement is due to a combination of transfusion and better obstetric methods. These two conditions account for nearly all the reduction in the total mortality; the deaths among the other conditions are little altered. Of greater general interest is the relative part which was played by hæmorrhage and by shock in causing death, and the effect of the transfusions in each of these. The deaths are arranged in table IV according to which factor appeared to be more important. These deaths are divided into four groups, marked in the table by headings whose meaning is as follows.

Hæmorrhage.—Pure hæmorrhage deaths; patients who literally bled to death before the hæmorrhage could be controlled.

Hæmorrhage shock.—Patients who had severe hæmorrhage which was finally arrested, but who died a few hours later with symptoms of shock. Some of these cases may be analogous to the delayed death which follows the withdrawal of large amounts of blood from experimental animals. The other deaths appear to be due to a combination of shock and hæmorrhage.

TABLE IV—ANALYSIS OF DEATHS ACCORDING TO HÆMORRHAGE AND SHOCK

Cause of death	Parturitional deaths in each period			
	1929–31	1932–34	1935–37	1938–40
Hæmorrhage	8	11	2	0
Hæmorrhage shock	20	12	12	9
Shock-hæmorrhage	21	18	18	19
Shock	9	13	7	12

Shock hæmorrhage.—These patients died essentially of shock; they had had slight to moderate hæmorrhage previously, but never sufficient to give rise to anxiety.

Shock.—Patients who died of shock uncomplicated by hæmorrhage except of trivial amount.

Table IV shows that hæmorrhage deaths fell significantly in the last two periods. This fall coincides with the introduction of transfusions on a large scale, and may quite reasonably be ascribed chiefly to this factor. The hæmorrhage-shock deaths show a slight decrease which can scarcely be considered significant. It might, however, have been anticipated that they would have risen somewhat, because patients who had been saved from pure hæmorrhage death would be possible candidates for death from post-hæmorrhagic shock a few hours later. Thus the fact that there is no increase in this group may be considered a possible indication of benefit from the transfusions. On the other hand, the shock-hæmorrhage and the shock deaths do not show any fall. There is no evidence from these figures that blood-transfusion was of any benefit whatever in shock, whether complicated by moderate hæmorrhage or not. It appears therefore that the fall in the parturitional deaths from these five obstetric conditions is essentially due to the beneficial effect of transfusion in cases of severe hæmorrhage and to the improvement in the obstetric treatment of placenta prævia, and probably also of accidental hæmorrhage.

SHOCK FROM DYSTOCIA OR OPERATIONS

In the sixth group of parturitional deaths, those following dystocia or operations, the policy with regard to transfusions was different from that in the other five conditions. Transfusion in this group was employed on any scale during the last period only. Table V shows the

BLOOD-TRANSFUSION FOR OBSTETRIC HÆMORRHAGE AND SHOCK

H. L. SHEEHAN, M.D., D.Sc. MANC., M.R.C.P.
DIRECTOR OF RESEARCH, GLASGOW ROYAL MATERNITY HOSPITAL

TRANSFUSION of blood or blood derivatives in conditions of hæmorrhage or shock in ordinary surgical practice is based on a wide range of experimental studies and physiological considerations, and its value is accepted by the consensus of medical opinion (Whitby, Vaughan and Brown 1941, Grant, Hudson, McMichael and Nosworthy 1942). There is, however, little objective evidence of its actual efficacy in saving the lives of patients. In making any statistical study of the results of transfusion it is always difficult to obtain adequate control data. A surgeon cannot very well withhold transfusion from alternate cases in a large series of patients gravely ill from hæmorrhage or shock. It is therefore necessary to compare the mortality from hæmorrhage and shock in a single hospital at a time when few or no transfusions were given for these conditions with the mortality later when transfusions were being given freely. For such a comparison to be valid other potential sources of variation in the mortality must as far as possible be eliminated. The numbers of cases and their type and severity should have remained fairly constant, and other lines of treatment should not have been significantly altered. These conditions are sufficiently fulfilled in the 12 years 1929–40 at the Glasgow Royal Maternity Hospital. During this time, 765 transfusions were given in the hospital for hæmorrhage and shock, and 259 women died during parturition as a result of these conditions. The figures, when subdivided into the necessary subgroups, are not large enough to carry great weight statistically, but they are sufficient to justify provisional conclusions. The analysis suggests that the efficacy of blood-transfusion in cases of hæmorrhage is well supported, but that its value in shock is doubtful.

It may be objected that the findings in 'obstetric shock' have little or no bearing on shock in general, but there is little evidence that shock in obstetrics is fundamentally different from shock in surgical trauma. There are certainly a few pathological differences—for example, fat-embolism of pulmonary capillaries is not found in obstetric cases—but these hardly detract from the general clinical and pathological similarity (Robb-Smith 1941, Sheehan 1939, 1940). Until more objective evidence is available, it does not appear justifiable to assume that transfusion for shock in obstetrics gives information which is inapplicable to shock in other conditions.

OBSTETRIC COMPLICATIONS IN THE FOUR PERIODS

The 12 years from 1929–40 are divided here, on the basis of the transfusion arrangements, into four periods of 3 years each. The total obstetric admissions to the hospital in each period show little variation. The numbers of cases of hæmorrhage and shock admitted to the hospital as a result of each obstetric complication are about the same in each period: what differences there are are small and appear to be due to chance. There is no reason to suspect that the severity of the cases has altered. Thus the four periods can quite fairly be compared with each other, and the actual numbers of deaths from hæmorrhage and shock in each period can be taken as an inverse measure of the efficacy of the treatment. The really important difference in treatment has been the extensive use of transfusions in the last two periods, but there has also been a great improvement during the last two or three periods in the treatment of placenta prævia and some improvement in the treatment of accidental hæmorrhage. The reduction of the mortality from these conditions is partly due to this better technique and partly to transfusion; it is not possible to assess the relative importance of the two, and this must be borne in mind when considering the results. The puerperal deaths in the hospital are higher in the first period than in later periods because most patients who developed puerperal sepsis during the last three periods were transferred to a fever hospital; this explains the unevenness of the data about puerperal cases in tables I and V.

An analysis has been made of the parturitional deaths from hæmorrhage or shock in each of the four periods. The term 'parturitional death' in this paper is applied to deaths during labour or within 8 hours after delivery; deaths later than that time are classed as puerperal. The obstetric conditions which caused these parturitional deaths fall into 6 main groups.

Placenta prævia.—About 300 patients were admitted to the hospital in each period. Hæmorrhage played an important part in causing the deaths.

Abortion.—About 1400 patients were admitted to hospital in each period, but most of these were not at all ill; hæmorrhage was a significant factor in causing those few deaths which occurred.

Retained placenta and postpartum hæmorrhage.—About 300 patients were admitted in each period; death was sometimes due mainly to hæmorrhage but often resulted from shock following attempted or successful removal of the placenta several hours after the baby had been born.

Mixed and concealed accidental hæmorrhage, with a pathological basis of uteroplacental apoplexy.—About 250 cases were admitted in each period; death was usually due to shock, the retroplacental clot being rarely more than 2 lb. in weight, but in a few cases there was fatal postpartum hæmorrhage as a result of atony of the uterus after delivery.

Rupture or inversion of the uterus.—There were also about 25 cases of rupture and 3 of inversion in each period; death was usually due chiefly to shock, though there was very severe external or internal hæmorrhage in a few ruptures as a result of the rupture of parametrial vessels.

Shock following difficult or operative delivery.—There were about 2000 operative cases of difficult delivery in each period, but only about 50 of these developed a postpartum collapse. Hæmorrhage was usually of little importance in these cases. This group is in certain ways different from the previous five, and is dealt with separately at the end of the paper.

Some types of parturitional death have been excluded, even when the immediate cause of death was a sudden intrapartum or postpartum collapse. These comprise deaths under anæsthesia (except in cases where hæmorrhage or shock was clearly the essential factor and the anæsthetic played no significant part), hyperemesis, eclampsia, hypertensive toxæmia and intrapartum sepsis, and intercurrent conditions such as cardiac disease, anæmia or pneumonia. A number of these conditions were only recognised at autopsy, which was made in over three-quarters of all the deaths in the hospital. It is not possible to say accurately how many patients in each period had clinical indications for transfusion, but about 500–600 appears to be a reasonable estimate.

BLOOD-TRANSFUSIONS IN EACH PERIOD

The only transfusions considered in this paper are of citrated blood given to patients during labour or within 8 hours after delivery, in the treatment of shock or hæmorrhage. These actually constitute about 90% of the total transfusions in the hospital, the remainder being given for anæmia or in the puerperium. A patient is not classed as transfused if she died in the course of a transfusion before any beneficial effect of the treatment could be expected. The amount of blood given varied according to the condition of the patient and the response to the transfusion. In some cases only one transfusion of 600 or 800 c.cm. of blood was given; in other cases three or four transfusions were given with a total of up to 3000 c.cm. of blood. The average volume given was about 1000 c.cm. Plasma-transfusions have been given to a few patients, but the numbers are not sufficient to allow of any conclusions.

The total numbers of transfusions given in each of the four periods are shown in table I. It will be seen that, for practical purposes, the first two periods are negative controls, while the third and fourth are periods when transfusions were practised on a large scale. There were only about 25 transfusions for hæmorrhage or shock in each of the first two periods 1929–31 and 1932–34. No satisfactory service for transfusions had been organised; on the few occasions when it was decided that a transfusion should be given the relatives had to be sent for and typed before blood could be collected. The delay was thus considerable.

At about the beginning of the third period, 1935–37, a complete change of policy was made (Black 1937). Blood-transfusion was adopted as a routine treatment for all patients who appeared to need it. Credit for the new arrangement is due to several members of the consultant staff and to a series of energetic resident obstetrical officers A complete blood-transfusion service for the hospital was organised with a panel of 200 donors living in the vicinity When a patient needed transfusion, her blood was typed and a car was immediately sent for the nearest suitable donor The patient was given a preliminary intravenous saline and by the time this was completed the donor's blood was usually ready The time taken to get the donor and collect the blood was usually quite short—often less than an hour—but this delay proved in practice to be the weak point of the system It will be seen that during the third period 303 transfusions were given (table I) Many seriously ill patients were transfused as is shown by the fact that only a third of the patients who died in the puerperium had not been transfused at about the time of delivery But too many desperately ill patients died before transfusion could be given, in two-thirds of the parturitional deaths the patient had not been transfused At the beginning of the fourth period, 1938–40, the system was altered to close this loophole Several bottles of stored blood were kept in the refrigerator ready for immediate use in emergency The blood was generally used within a few days after collection, and was only very rarely more than a week old The donor service was kept for all the less urgent transfusions and for maintaining the blood-bank During this fourth period, 368 transfusions were given for cases of hæmorrhage and shock The greater efficiency of the new system will be seen from table I In only a quarter of the parturitional deaths had the patient not been transfused as compared with two-thirds in the previous period The transfusion of less desperately ill patients continued at about the same rate as before, in about a third of the puerperal deaths the patient had not been transfused at delivery

TABLE I—TRANSFUSION ARRANGEMENTS IN FOUR 3 YEAR *PERIODS*

Period	Transfusions	Deaths			
		Parturitional		Puerperal	
		Total	Not transfused	Total	Not transfused
1929–31	About 20	58	56	36	32
1932–34	About 25	54	49	17	16
1935–37	303	39	26	21	7
1938–40	368	40	11	15	5

These figures are presented only as a convenient yardstick of the efficiency of the transfusion arrangements They are of course not a measure of the number of patients whose lives were saved by the transfusions, nor of the number of patients who were actually transfused but would not have died in any case The distribution of the transfusions among the 5 obstetric complications is shown in table II More detailed analysis shows that the transfusions were given in approximately the same average number and volume to these patients, whether they were suffering mainly from hæmorrhage or mainly from shock

TABLE II—TRANSFUSIONS GIVEN FOR EACH OF THE FIRST FIVE OBSTETRIC COMPLICATIONS

TABLE III—ANALYSIS OF DEATHS ACCORDING TO OBSTETRIC COMPLICATIONS

	II				III			
Complication	Transfusions given in each period				Parturitional deaths in each period			
	1929–31	1932–34	1935–37	1938–40	1929–31	1932–34	1935–37	1938–40
Placenta prævia	10	11	59	52	15	9	3	4
Abortion	Ab 1	3	74	72	3	5	3	0
Retained placenta and PPH	Ab 5	Ab 7	119	172	21	11	18	17
Accidental hæmorrhage	2	3	36	56	13	20	8	11
Rupture and inversion of uterus	Ab 2	Ab 1	15	16	6	9	7	8
Ab = about	Total				58	54	39	40

RESULTS

The parturitional deaths fell from about 56 in each of the first two control periods to about 40 in the third and fourth periods when transfusion was being employed on a large scale The fall is sufficient to merit analysis both with regard to the particular obstetric condition and to the type of death Table III shows the deaths arranged according to the obstetric condition It will be seen that there is a significant reduction in the deaths from placenta prævia and a much less definite reduction in the deaths from accidental hæmorrhage As pointed out earlier, this improvement is due to a combination of transfusion and better obstetric methods These two conditions account for nearly all the reduction in the total mortality the deaths among the other conditions are little altered Of greater general interest is the relative part which was played by hæmorrhage and by shock in causing death, and the effect of the transfusions in each of these The deaths are arranged in table IV according to which factor appeared to be more important These deaths are divided into four groups, marked in the table by headings whose meaning is as follows

Hæmorrhage —Pure hæmorrhage deaths, patients who literally bled to death before the hæmorrhage could be controlled

Hæmorrhage shock —Patients who had severe hæmorrhage which was finally arrested, but who died a few hours later with symptoms of shock Some of these cases may be analogous to the delayed death which follows the withdrawal of large amounts of blood from experimental animals The other deaths appear to be due to a combination of shock and hæmorrhage

Shock-hæmorrhage —These patients died essentially of shock, they had had slight to moderate hæmorrhage previously, but never sufficient to give rise to anxiety

Shock —Patients who died of shock uncomplicated by hæmorrhage except of trivial amount

TABLE IV—ANALYSIS OF DEATHS ACCORDING TO HÆMORRHAGE AND SHOCK

Cause of death	Parturitional deaths in each period			
	1929–31	1932–34	1935–37	1938–40
Hæmorrhage	8	11	2	0
Hæmorrhage shock	20	12	12	9
Shock hæmorrhage	21	18	18	19
Shock	9	13	7	12

Table IV shows that hæmorrhage deaths fell significantly in the last two periods This fall coincides with the introduction of transfusions on a large scale, and may quite reasonably be ascribed chiefly to this factor The hæmorrhage-shock deaths show a slight decrease which can scarcely be considered significant It might, however, have been anticipated that they would have risen somewhat, because patients who had been saved from pure hæmorrhage death would be possible candidates for death from post-hæmorrhagic shock a few hours later. Thus the fact that there is no increase in this group may be considered a possible indication of benefit from the transfusions On the other hand, the shock-hæmorrhage and the shock deaths do not show any fall There is no evidence from these figures that blood-transfusion was of any benefit whatever in shock, whether complicated by moderate hæmorrhage or not It appears therefore that the fall in the parturitional deaths from these five obstetric conditions is essentially due to the beneficial effect of transfusion in cases of severe hæmorrhage and to the improvement in the obstetric treatment of placenta prævia, and probably also of accidental hæmorrhage

SHOCK FROM DYSTOCIA OR OPERATIONS

In the sixth group of parturitional deaths, those following dystocia or operations, the policy with regard to transfusions was different from that in the other five conditions Transfusion in this group was employed on any scale during the last period only Table V shows the incidence of transfusions and the number of parturitional deaths These deaths were due usually to shock alone, though in a few cases there was slight to moderate hæmorrhage It will be seen that in the last period the total number of transfusions was very much greater than in the previous periods, and that about a third of all the patients who died had been transfused Nevertheless the parturitional deaths show no improvement at all 18, 13, 17, 20 The lack of any effect from transfusions in this group of shock cases is in agreement with the conclusions about shock in the five conditions which were considered previously

It does not appear profitable to speculate here as to why the introduction of transfusions on a large scale has not reduced the mortality from shock in this hospital, though it has been of obvious value in the treatment of hæmorrhage The real matter requiring attention is the production of adequately controlled data as to the effect *of transfusion in cases of shock in non-obstetric patients*

TABLE V—TRANSFUSIONS AND DEATHS FROM SHOCK AFTER DYSTOCIA OR OPERATIONS

Period	Trans - fusions	Deaths			
		Parturitional		Puerperal	
		Total	Not transfused	Total	Not transfused
1929–31	0	18	18	36	36
1932–34	*About 3*	*13*	*11*	*13*	*13*
1935–37	8	17	17	8	8
1938–40	38	20	14	9	6

SUMMARY

From an analysis of the results of 765 blood-transfusions for obstetric conditions causing hæmorrhage and shock it is concluded that the mortality from hæmorrhage has been much reduced by transfusions, but that the mortality *from shock has been unaffected by them*

REFERENCES

Black, M D (1937) *Brit med J* i, 903
Grant, R T, Hudson, R V, McMichael, J and Nosworthy, M D (1942) *Proc R Soc Med* 35, 445
Robb Smith, A H T (1941) *Lancet*, i, 135
Sheehan, H L (1939) *J Obstet Gynæc* 46, 218, (1940) *Lancet*, i, 831
Whitby, L E H, Vaughan, J, and Brown, H (1941) *Proc R Soc Med* 34, 257

SERRATUS MAGNUS PALSY

J S RICHARDSON, M D CAMB, M R C P LOND
MAJOR R A M C

ALTHOUGH about 175 cases of isolated serratus magnus palsy have been reported (Foley and Wolf 1941) since the original description by Velpeau in 1925, it is still an uncommon lesion It was therefore with some surprise that I saw, over a short period, 7 uncomplicated cases and 2 others in which the serratus magnus weakness was part of a more widespread condition

From a study of published cases it seems that trauma plays a leading part in causing this lesion, with either concussion of the long thoracic nerve or partial rupture of its fibres (Fitchet 1930, Berkheiser and Shapiro 1937) Horwitz and Tocantins (1938a and b), in two papers based on anatomical dissections of 100 long thoracic nerves, point out that a likely site of injury to the nerve is between the coracoid process and the second rib When a downward thrust is exerted on the shoulder the angulation of the nerve as it crosses the second rib is increased and paralysis may result Individual variations in response to like trauma can, they say, be explained by morphological differences in the formation and course of the nerve They also point out that when the subcoracoid and subscapular or less important accessory bursæ become inflamed and distended they may exert pressure on the nerve, or lead to direct spread of the infection to it (case 9) Cases of paresis after abdominal operations have been reported (Thorek 1926, Foley and Wolf 1941), and it is possible that hyper-abduction and retraction of the shoulder on the operating table may account for them The condition has also been found after exposure to cold or wet, and in association with such specific fevers as typhoid, pneumonia, erysipelas, diphtheria or puerperal fever, and it is seen in cases of cervical neuritis, progressive muscular atrophy, facioscapularhumeral dystrophy and poliomyelitis

The signs of serratus magnus-palsy are well known, and winging of the scapula is always conspicuous when the patient pushes against a wall When the long thoracic nerve alone is paralysed the vertebral border of the scapula *with the arm at the side tends to lie* parallel to the spine or only slightly obliquely If, however, the lower and middle fibres of trapezius are also involved the vertebral border lies with the lower angle nearer the spine (Bramwell and Struthers 1903) Severe pain in the neck and scapular region, lasting for over a week in acute cases and for weeks or even years in those with an insidious onset (case 1), may be a prominent symptom When it is present it suggests the diagnosis of rheumatism of the shoulder-joint, 3 of our cases were referred to hospital as such The absence of limitation of passive movement may lead to the case being dismissed as not having an organic basis

CASE-RECORDS

The following cases were seen at military hospitals within the period of a year

1 —A lance corporal of 30, during the course of a left lower lobar pneumonia in May, 1941, developed signs of meningeal irritation, but the cerebrospinal fluid showed no abnormality 6 days after admission During convalescence winging of the right scapula was noticed, and he was unable to raise his arm above his head When seen 4 months later the paralysis was complete in spite of physiotherapy

2 —A lieutenant of 26 had what was taken to be influenza in the middle of May, 1941, 6 days later he developed a severe *sore throat with cervical adenitis and monocytosis* A Paul-Bunnell test was strongly positive, confirming the diagnosis of glandular fever During the third week he first noticed an ache over the right deltoid and shoulder joint, and later had weakness on reaching forward to lift things He also noticed that his right scapula stuck in to chairs with solid wooden backs when he sat on them When he was examined in July, 1941, he had an incomplete paresis of the right serratus magnus, with winging of the scapula, but by October he wrote that he had slowly improved and had no inconvenience at all from his shoulder

3 —A lieutenant of 31, a bank clerk before enlistment, had been in bed during February and March, 1941, with myalgic pains in both shoulders He *was seen* in May, 1941, when he was still complaining of weakness of the arms and of being generally exhausted by the middle of the day The only positive findings were weakness and wasting of the right serratus magnus, of the lower fibres of the left trapezius muscle, and of the infraspinatus and deltoid muscles

4 —A signalman of 28, civilian occupation baker, complained of severe pain and burning in the right shoulder and neck *for* 6 months, with considerable weakness on raising the arm He had had no serious illness in the past, but had had a little pain and stiffness in the right shoulder occasionally for 4 years He had at no time damaged it There was complete paralysis of the right serratus magnus, with inability to raise the arm above the *horizontal* without assistance from the other arm No sensory loss

5 —A lieutenant of 32 first noticed pain down the back of his neck and left shoulder in February, 1941 At the same time he had pins and needles down the radial side of the left arm and forearm, passing to the ring and middle fingers No weakness was *noted* by the patient and the sensory phenomenon cleared up in about a month He did *not report* sick until 6 months after the onset of his symptoms On examination, some weakness of the left serratus magnus was found, without any sensory change or other lesion

6 —A RASC driver of 29 sustained an injury to the right shoulder at the beginning of March, 1941 He was given antitetanus serum into the right upper arm and 6 days later developed a generalised urticaria lasting 2 days As the rash faded he began to get severe pains in both arms and shoulders, and still had them when seen a month later At that time he had a right deltoid, supraspinatus and infraspinatus weakness with winging of the left scapula and a *left* serratus magnus weakness without any sensory changes He was treated on an abduction splint and given physiotherapy with some improvement to most of the muscles, but when seen in *October, 1941*, there was a complete left serratus magnus palsy

7—A RASC driver of 30, civilian occupation clerk, was injured at rugby football in 1935, and afterwards had pain and weakness in the shoulder He had been able to play games and swim since this accident, but could not raise his right arm above his head at times Typical winging of the scapula with serratus magnus weakness was found There was tilting of the scapula with the lower angle nearer the spine, indicating weakness of the lower trapezius fibres when the arms were resting at the sides No other lesion or sensory change was found

8—A lance corporal of 26 first noticed stiffness and aching down the right sternomastoid muscle, and on moving the neck to the right, in September, 1940 He had slept for one night in a draught, and the pain persisted for 4 days He remained on full duty for 3 weeks without any weakness, but, after he had been lifting coal for 3 days a friend noticed that his right shoulder blade was sticking out When seen in December, 1940, he had a right serratus magnus paralysis, with tilting of the scapula at rest, so that the lower angle was ½ in nearer the midline on the right than on the left There was no sensory change or other physical sign The serratus magnus showed no reaction to faradism but responded normally to galvanism When last seen in February, 1941, the physical signs had changed very little, but the patient thought he had made some improvement

9—*A private of 26 complained that he had had intermittent* pain and stiffness of the right shoulder region since the age of 16. He found, in the Army, that he could not bear the weight of a pack on his shoulder and recently noticed that he could not get his arm above the horizontal He had a severe but incomplete paralysis of the right serratus magnus with moderate winging of the scapula and inability to get his arm above his head He was treated with rest and physiotherapy but without improvement It is possible that this is an example of bursitis leading to the paresis, as there was a long history of pain and stiffness of the shoulder joint before the weakness was first noticed

DISCUSSION

These cases differ from those in other series in that infection plays the chief part and only one (case 7) can be directly attributed to trauma The case that followed pneumonia (case 1) was of interest since the disease was accompanied by evidence of meningeal irritation with a normal lumbar puncture fluid, as might be expected with a peripheral nerve lesion The association of this palsy with glandular fever is also noteworthy (case 2) The first symptom was pain and aching in the right deltoid region during the third week of the illness, while the patient was still in bed and his sore throat beginning to subside Some weakness in raising the arm was noticed at the same time, but was never severe and has steadily improved We have here an example of neuritis of the long thoracic nerve occurring in a disease that is considered by many to be due to a virus infection

The case in which the serratus magnus palsy was part of a widespread infection of the anterior primary divisions (case 3) resembles those described recently by Wyburn-Mason (1941) as epidemic brachial neuritis, and there are, also, two examples of isolated paralysis in which there is no indication of the cause Both cases 4 and 5 had sensory phenomena, such as pins-and-needles or burning pain in the neck, associated with the serratus weakness, but neither had a systemic disturbance or a history of trauma It is thought that, as suggested by Wyburn-Mason, these cases are analogous to the brachial neuritis that he described, except that here the lesion is not a radiculitis or infection of the anterior primary divisions, but a neuritis of a peripheral nerve Case 8 may belong to this group but the paralysis was only noticed after repeated muscular exertion

It was not possible to follow up these cases satisfactorily and little can be said about the prognosis, but from a study of published work it seems that, provided adequate treatment is given early—or even after some months delay—encouraging results can be obtained

In the acute stage more than a sling and pad over the scapula, as advised by some writers, is required, the lesion should not be regarded lightly, for the resulting disability may be a severe handicap The patient should either be confined to bed, or a suitable support should be fitted to prevent stretching of the paralysed muscle Horwitz and Tocantins (1938) say that patients are relieved by lying prone, as the supine position tends to stretch the nerve, they have also designed a brace that raises the head of the humerus and rotates the scapula to its proper position The elbow is kept flexed to relieve the pull of the antagonistic muscles

SUMMARY

A series of 7 cases of isolated serratus magnus paralysis are reported, only 1 was due to trauma, 1 to trauma and infection, 1 was probably secondary to bursitis, 2 were associated with known infectious processes, and 2 are considered to be analogous to recently reported cases of epidemic brachial neuritis One example of this brachial neuritis with involvement of the long thoracic nerve is also described

Treatment should be strict as soon as this peripheral nerve lesion is recognised, so as to prevent the development of a troublesome disability

I wish to thank Lieut Colonel J G Ronaldson for permission to publish this paper, Major W Ritchie Russell for seeing some of the cases, and Major M H McArdle for his help

REFERENCES

Bramwell, E and Struthers, J W (1903) *Rev Neurol Psychiat* 1, 717
Berkheiser E J and Shapiro, F (1937) *J Amer med Ass* 108, 1790
Fitchet, S M (1930) *New Eng J Med* 203, 818
Horwitz, M T and Tocantins L M (1938a) *J Bone Jt Surg* 20, 720 (1938b) *Anat Rec* 71, 375
Thorek M (1926) *Amer J Surg* 40, 26
Wyburn Mason, R (1941) *Lancet* ii, 662
Foley, W E and Wolf, J (1941) *J Iowa, St med Soc* 31, 424

OSTEOMYELITIS OF FRONTAL BONE TREATED WITH SULPHATHIAZOLE

G N TAYLOR, M B DUBL
RESIDENT SURGICAL OFFICER AT THE SEAMEN'S HOSPITAL

A H WALTERS
RESIDENT PATHOLOGIST AT THE ALBERT DOCK HOSPITAL

A SEAMAN of 18, first reported at the Seamen's Hospital on June 28, 1941, complaining of pain and a discharge over the left eye Three months before he had had a severe attack of malaria on board ship He was treated by the captain and during the illness both his eyes became swollen The captain incised the upper lid of the left eye, and pus discharged Soon afterwards his forehead became swollen, this was also incised and pus discharged He then completed his voyage and came home Two months after the onset of symptoms a small piece of bone was discharged from the incision in the upper left eyelid, which had continued to discharge pus

On examination a month after this he appeared healthy with no obvious signs of intercurrent infection The left eyeball was sunk into the orbit owing to loss of orbital cellular tissue There was a sinus in the left upper eyelid which discharged about 4 c cm of thick yellow pus daily The skin of the forehead was boggy, owing to a collection of underlying pus X rays showed decalcification of frontal bones on both sides, left more than right, and several sequestra were discernible On July 26 the frontal bone was exposed through a bifrontal flap, three necrosed bone areas each about the size of a penny were discovered, and a considerable area of bone in the region was removed An extradural collection of pus was sponged away The frontal sinus was packed and drained through a stab wound above the left eyebrow, and the whole exposed area was then lightly packed with 'Vaseline' gauze and rubber dams inserted to facilitate drainage Intravenous drip serum was given throughout the operation Sulphapyridine, 4 g daily, was given by mouth for 10 consecutive days after operation On the 10th day the first dressing was performed and a profuse discharge of pus was found, giving a pure culture of *Staphylococcus aureus* Dressings were done at 5-day intervals under anæsthesia, and the discharge was found to be getting rapidly more profuse On Aug 27, a month after operation, he was very ill and the discharge profuse At this point we were able to procure a supply of sulphathiazole, 12 g of the powder was placed in a 100 c cm Erlenmeyer flask and dissolved in 60 c cm of doubly-distilled water, and a further 6 g was dissolved in 30 c cm of water in another flask The flasks were autoclaved at 5 lb pressure for 15 min A cannula was tied into the internal saphenous vein The rubber seal covering the top of a 2-litre ‘Vacoliter’ containing 5% glucose saline was removed and by means of a 20 c cm syringe the contents of the flask containing 12 g of sulphathiazole in solution were squirted into it down the air-return tube The vacoliter was then connected to the cannula and the two litres allowed to run in, over 16 hours In a similar way the 6 g of dissolved sulphathiazole in the other flask were transferred to a vacoliter containing 1 l of 5% glucose saline, and the drip was continued with this when the other vacoliter was empty The second vacoliter emptied in 8 hours and the cannula was then removed The patient had received 18 g of sulphathiazole in 3 l of fluid in 24 hours Fluids were restricted to a minimum during this period For the next 4 days 18 g of sulphathiazole was given by mouth daily, 3 g four-hourly with fluids up to 8 pints daily At the end of this period the patient's red-cell count had dropped from 4,750,000 to 3,750,000, and the hæmoglobin from 90% to 65%, achromia and anisocytosis were noted The white cells rose from 8200 to 15,800 per c mm, and the polymorphs—contrary to expectation—from 69% to 76% The wound was dressed 2 days after cessation of sulphathiazole and the amount of pus was found to have diminished greatly After this the wound seemed to become rapidly less painful and the five openings for drainage began to heal The patient appeared to be much less toxic as time went on He was discharged from hospital on Oct 15 and has since attended for dressings All the sinuses have now dried up and the skin has healed over them He feels well and would like to go back to sea

Our thanks are due to Messrs May and Baker for supplying the sulphathiazole (‘M&B 760’) The operation was done by Mr H E Griffiths, who gave us permission to publish this note

Reviews of Books

Therapy of the Neuroses and Psychoses

SAMUEL HENRY KRAINES, M D, associate in psychiatry, University of Illinois London Henry Kimpton Pp 512 25*s*

THE chief value of this book lies in the careful evaluation, from the patient's standpoint, of the meaning and quality of a neurotic symptom The clinical case-material is given in full and is therefore somewhat repetitive, but it is interesting to note how similar it is to that at present arising here, where stresses are quite different In other words, the neurotic will never want material to weave into his pattern, come what Utopia there will Dr Kraines is a Meyerian, and he therefore gives much weight to environmental factors as they affect the personality as a whole He insists on the need for re-education of faulty habits, and puts down much of the therapeutic value of psycho-analysis to the repeated discussions of material which, by familiarity, loses most of its former distressing quality Speaking of desensitisation he says, “Repeated discussion with the patient about the problem is very much the same as the use of pollen vaccines for the hay-fever sufferer, desensitisation should be done by mild and superficial discussion at first, deeper, more pointed, and even more pride-wounding discussions may be carried on later, as the patient builds up a tolerance and an ability to withstand the shocks” The arrangement follows a reasonable plan, he gives first a description of the psychiatric states, followed by the common reactions shown by neurotics, and discusses each in turn Different therapeutic practices are set forth and linked with actual cases It is clear that the author himself prefers something logical rather than pragmatic, but his survey is catholic

Principles of Anatomy as seen in the Hand

(2nd ed) F WOOD JONES, D Sc, F R C S, F R S London Baillière, Tindall and Cox Pp 418 25*s*

RESTRICTION of the student's curriculum in anatomy is once more being debated in the journals This book makes it clear that, if there is to be any understanding, anatomy must be complete The author chose the hand for his study during the last war, recognising its great importance, and it is opportune that a second edition should appear at this time The first part is devoted to the arrangement of the bones, with their morphological significance The flexure lines, the cleavage lines, the papillary ridges, the nails and the hairs are then studied, and in this section there is much to be learned The function of the digits and of the hand as a whole, and the arrangement of the fascial layers are described in detail, but the most instructive and interesting section deals with the action of the muscles, as agonists, antagonists, synergists or fixators, and shows how these actions are often wrongly described in standard works, and how trick movements may deceive the unwary The arrangement of the nerves, with their central and peripheral connexions, and the effects of section are studied, and the final chapters deal with the blood-vessels, lymphatics and sympathetics The book is easy to read and well illustrated, no part could have been left out It should be the standby of surgeons and physicians, nowadays, when the hand is so often partially or totally wrecked by burn or injury

Handbook of Ophthalmology

(4th ed) HUMPHREY NEAME, F R C S, F A WILLIAMSON NOBLE, F R C S London J and A Churchill Pp 320 18*s*

THIS fourth edition is welcome, it gives a concise description of the diagnosis and treatment of all the ordinary diseases and injuries of the eye, it will be especially useful to newly qualified medical officers called upon to treat ophthalmic cases without previous experience, and to undergraduates, who will find the cerebral causes of ocular derangement particularly well described Therapeutic measures, so often left vague, are given in detail, and there is an up-to-date account of vitamins in relation to the eye Apart from the omission of one or two well-known operations, such as iridencleisis and posterior sclerotomy, the surgical instructions are good

Glands and their Functions

R G HOSKINS, Ph D, M D, director of research, Memorial Foundation for Neuro endocrine Research Harvard Medical School London Kegan Paul, Trench, Trubner and Co Pp 388 18*s*

IT is impossible for any book on the endocrines to be completely up to date or for one author to show equal expertness on every aspect of this enormous subject, but Dr Hoskins has done as much as a man might Nevertheless, it is a little surprising to read that in diabetes mellitus “nearly all agree in the desirability of limiting the carbohydrate”—apparently without respect to the clinical type His style is easy—sometimes a little too determinedly so Perhaps he was not clear for whom he wrote, for in some places simple medical terms are explained as to a layman, while in others hard phrases (“polarization of synaptic conduction”) go unelucidated To the expert it may appear too simple and too little documented, for the student there may be too much jam and not quite enough powder, but usually he follows a middle way, and the book will suit any reader with a fair knowledge of general medicine and but little of endocrinology

For the hard worked general physician who wants a sound and sufficiently detailed book which he can hold in comfort and read with his feet on the mantelpiece it is the best book on the ductless glands which has yet been published

Exercises in Electrocardiographic Interpretation

LOUIS N KATZ, M D London Henry Kimpton. Pp 222 25*s*

IN this book tracings from 90 subjects are reproduced which the reader is asked to interpret for himself On the page opposite to each figure the author gives his own reading and interpretation and a brief clinical note The curves are chosen to cover the more important and common pictures, emphasis being rightly placed on the tracings of myocardial ischæmia A study of this collection will serve as a useful tutorial to those with a little knowledge of the subject and will not be without interest to the more experienced cardiologist, even if his interpretation does not always coincide exactly with the author's All illustrations include two chest leads

THE LANCET

LONDON SATURDAY, MAY 23, 1942

LOCAL SULPHONAMIDES AND WOUND HEALING

JUST over two years ago the sulphonamides began to be locally applied Whether used in open or closed wounds clinical reports were glowing, and experimentally neither leucocyte infiltration nor granulation-tissue formation seemed to be impaired even in high concentrations Then came whispers that the sulphonamides interfered with wound healing Now E M BICK[1] of New Jersey brings clinical evidence based on 100 cases, and declares that healing is definitely retarded and local sulphonamides should be reserved for the obvious contaminated wound He applied sulphonamide powder, either sulphanilamide or sulphathiazole, in doses of 1 5 to 10 g in half the cases, and then watched the wounds heal In the sulphonamide group, he says, the edges were apt to be reddened and often swollen and he often probed because he thought pus might be present, in many cases serosanguineous fluid could be expressed, and as late as the 8th day after primary suture sulphonamide granules and greyish granulations could be seen in any reopened wound The routine cartilage operation on the knee-joint was, he felt, a standard procedure and therefore a fair test under equal conditions Sulphonamide powder was inserted into the wounds of 12 of 26 meniscectomy operations, and BICK declares that the scars in the sulphonamide group were always broader and deeper than in the controls, locally there was a greater mass of subcutaneous fibrosis and he publishes a picture of a case in this group with the wound gaping and oozing

Of the 50 local sulphonamide cases on which BICK bases his opinion 27 were joint or tendon operations This may explain the rather surprising results Tendons and the adjacent areas are usually equipped with a poor blood-supply, and the vessels around the knee-joint only come into full function on obliteration of the main limb vessel, added to this the usual tight bandage after knee operations must further limit blood or serum oozing into the wound There is thus little blood available for the solution and subsequent absorption of the sulphonamide, and the drug, especially the more insoluble sulphathiazole, will clump and stay as a foreign body Any defects in wound healing may then be due to that COLEBROOK AND FRANCIS,[2] who were among the first in this country to report on the clinical use of sulphonamides locally, urged that the powder should be applied to a moist surface, and only in sufficient quantity to form a ' hoar frost " on the wound There was no advantage in heavier powdering KEY and BURFORD[3] have had the same experience After experimental work on the healing of soft tissues and fractures they used sulphanilamide powder as a routine in all clean operation wounds They report on 150 cases and emphatically say that wound healing was not interfered with unless unusually large amounts of the powder had been used In some of their early cases they did apply excess powder and serum collected in these wounds They now lightly sprinkle the powder and rarely use more than 5 g in a wound

F W TAYLOR,[4] of Indianapolis, protests against the practice of applying sulphonamides locally to wounds as a routine The dry powder staying in the small closed wound will, until it is in solution, act as an irritant and TAYLOR demonstrates the irritant action in animal experiments He inserted about a grain of different common sulphonamides beneath the rectus sheath of dogs, and small pieces of hard paraffin were similarly buried as controls Three days later sections were taken from these wounds The paraffin produced hardly any inflammatory reaction, but in the wounds treated with sulphonamides sections showed well-marked œdema with increased polymorphs and monocytes With sulphanilamide there was the least reaction, with sulphathiazole and sulphadiazine small abscesses were formed around the crystals Sulphanilamide is the most soluble of the common sulphonamides and the mildness of the tissue reaction it produces is probably due to the early solution of the powder That the dissolved sulphonamide is not damaging or toxic to living cells has been shown in some striking tissue-culture experiments by JACOBY, MEDAWAR and WILLMER[5] They have shown that in concentrated sulphonamide solutions the epithelial and fibroblast cells are completely at home and may be seen clambering and threading their way between sulphonamide crystals On the other hand proflavine, which we usually regard as not damaging to living tissues, is a deadly poison to these cells in concentrations even less than 1 1,000,000 The tissue-culture experiment is an even more strict test than the clinical or animal one, for there is no circulatory system or detoxicated mechanism to assist the cells Damage of the tissues or interference with wound healing by local sulphonamides appears to be due to excess powder remaining undissolved in the closed wound In the small dry wound it is important therefore to see that the powder is fine and to use it in small quantity, the insolubility of sulphonamides such as sulphapyridine, and to a less extent sulphathiazole, is a disadvantage In the open wound the problem does not arise, for any excess powder is rapidly washed out by the serum or the blood It is in fact difficult to retain the sulphonamide in the fresh excised bleeding wound

LIVE ABORTUS VACCINE

THE widespread infection of dairy herds with *Brucella abortus* is a direct loss to the farming industry, and excretion of the organism in the milk is the principal cause of undulant fever in this country Both veterinarians and doctors therefore are concerned with the search for a means of protecting cattle against this infection So far prophylactic inoculation with a dead vaccine has proved useless live vaccine has been uncertain in its results and not free from the risk of itself conveying infection In fact in 1936 the Ministry of Health forbade the use of live vaccine in tuberculin-tested herds because the milk from such herds is often not submitted to pasteurisation or other form of treatment by heat Extensive experience in the U S A and careful experiment in this country have however made it clear that the correct use of a live vaccine made from a known attenuated strain of *Br abortus* does not produce a lasting infection of cattle nor lead to the excretion of infective bacteria in the milk, while it gives substantial protection against even a virulent strain of the organism The ministry has now (order 1942, no 771) sanctioned the use of a live vaccine prepared and used according to methods approved by the Ministry of Agriculture Under the new voluntary control scheme which comes into force on June 1 the cost of the vaccine will be included in the annual premium for veterinary supervision

---

[1] *J Amer med Ass* 1942 118 511
[2] Colebrook L and Francis A E *Lancet* 1941 i 271
[3] Key J A and Burford T H *Surg Gynec Obstet* 1941 73 324
[4] *J Amer med Ass* 1942 118 959
[5] Jacoby F Medawar, P B and Willmer E N *Brit med J* 1941 ii 149

In the *Veterinary Record* for May 2 Mr JOHN FRANCIS, M R C V S, of the Pirbright Research Station, tells the story of the work which has led to this satisfactory conclusion Following BANG's demonstration in 1897 that contagious abortion was caused by a specific micro-organism M'FADYEAN was the first to employ an agglutination test by which it was hoped to detect infected cows which could then be isolated or destroyed But this hope was blighted by the unexpected chronicity of the infection and the long viability of *Br abortus* outside the animal body The "test and slaughter" policy had some success in the U S A but even there had to be abandoned on economic grounds Now that there is good prospect of reducing the incidence of the disease by prophylactic vaccination the hope revives that the "test and slaughter" policy may finally eradicate it The field results in America were reported recently by C K MINGLE to the Royal Society of Medicine Of 14,280 pregnancies in calves vaccinated with standard "strain 19" only 178 (or 1 2 per cent) aborted and gave a positive (or suspicious) agglutination reaction In this country A D McEWEN has had equal success at Wye Agricultural College with "strain 45 (20)" which is similar to strain 19 in antigenic value but which has the advantage over it in being "rough" and not producing agglutinins to confuse subsequent tests of immunity The use of either of these vaccines (and no others) is approved by the ministry, but at present strain 19 is to be preferred for calves as it is effective in a single dose, strain 45, of which two doses are required, being reserved for adult animals whose sale might be prejudiced by becoming positive reactors

THE ORGANISM OF POLIOMYELITIS

THAT acute anterior poliomyelitis is infective was proved by LANDSTEINER and POPPER[1] when they succeeded in infecting a monkey with human material Within a few years it became evident to most workers that the pathogenic agent was a filtrable uncultivatable virus But in the early days many workers claimed that a cultivatable streptococcus played an important rôle in the ætiology of the disease Even FLEXNER and his colleagues,[2] who were later mainly instrumental in proving the virus ætiology, considered that certain "globoid" bodies found in rich culture media inoculated with cerebrospinal fluid or brain tissue and incubated anaerobically might be the causative agent The general impression is that these organisms were often contaminants or appeared in the agonal stages or at autopsy ROSENOW, one of the earliest workers and chief proponent of the streptococcal theory, has held on to this view to the bitter end In 1917 he first reported the isolation of his micrococci[3] He considered that the filtrable organism generally accepted as the cause of the disease may be the form which this streptococcus tends to take under anaerobic conditions in the central nervous system Antisera prepared in horses from these streptococci were said to benefit human patients though experimentally the sera behaved like normal horse sera and were not able to neutralise the virus[4] In 1930 he claimed[5] to have isolated a streptococcus from the lesions and spinal fluid of monkeys during the acute stage of the disease produced by inoculation of filtrates of material from human cases In some cases this was possible even when cultures of the material injected proved sterile More recently he claimed[6] that the micrococci could be seen with an ordinary microscope in Seitz and Berkefeld filtrates stained with special stains These organisms were supposed to represent a stage in the development of the streptococcus previously isolated by culture His latest report[7] presents further supporting evidence for these theories as a result of studies with the electron microscope This new tool by extending resolving power to a present practical limit of about 50A is making it possible to study structures hitherto inaccessible to direct examination It has been used, for example, to record lysis by phage, the combination of antibodies with flagellar and somatic antigens, and the combination of plant viruses with antivirus molecules

ROSENOW has examined Berkefeld V, N and W and Seitz filtrates of glycerolated tissue taken from monkeys and a mouse during acute attacks, a chick-mash culture of the streptococcus from poliomyelitis, dextrose brain broth cultures of similar streptococci, and control tissues and culture media He does not mention examining any human material under the electron microscope The magnification used was 12,000 diameters The illustrations in his paper show bodies of varying sizes and shapes some of which could be described as coccal in form He says that the smallest forms seen resembling organisms approximated to the postulated size (8–17 mμ) of the virus particle He calculated that there were at least 400,000,000 diplococci per c cm of filtrate Though cultures of emulsions in dextrose brain broth of the different strains of what ROSENOW calls viruses represented in this study usually yielded the streptococcus, only 4 of 22 filtrates yielded pure growths of the streptococcus in this medium Innumerable attempts have been made by other workers to grow the virus in tissue cultures which have been used to cultivate many viruses successfully These media provide extremely favourable conditions for the growth of bacteria but no organism similar to ROSENOW's and suggestive of playing any rôle in the disease has been isolated The experiments of GILDEMEISTER,[8] using chick embryo brain, monkey serum and tyrode in Carrel flasks at 37° C, and those of SABIN and OLITSKY[9] with human embryonic material indicate the possibility of cultivating the virus in living tissue

The virus of poliomyelitis will survive 6–8 years in 50% glycerol, whereas the streptococcus of ROSENOW becomes inactive after little more than a year The streptococci in any form would also be unlikely to survive the treatment with ether which various specimens of fæces, flies and sewage have undergone before being inoculated into monkeys intraperitoneally and intranasally and producing the disease Using ultraviolet light with a magnification of 3500 **Barnard**[10] has demonstrated bodies with a cocco-bacillary form in preparations of the viruses of foot and mouth disease and vesicular stomatitis which have an estimated size of 8–12 mμ and 60–100 mμ respectively Therefore there is every possibility that the agent of poliomyelitis with an estimated size from filtration experiments of 8–17 mμ can be seen with the electron microscope But any attempt to relate these bodies to a bacterium and describe them as micrococci is only confusing the issue The question of visibility is at present dwarfed by more important issues, such as mode of spread, intermediate hosts and reservoirs of infection, which when solved will offer some possibility of combating the disease.

References

1 Landsteiner, K and Popper E *Wien klin, W schr* 1908, 21 1830, *Z ImmunForsch* 1909 2, 377 2 Flexner, S and Noguchi, H *J Amer med Ass* 1913, 60 362, *J exp Med* 18, 461, Flexner, Noguchi and Amos H L *Ibid* 1915, 21, 91 3 Rosenow, E C and Towne, E B *J med Res* 1917 36 175 *J Amer med Ass* 1917, 69, 261, 1074 4 Amos H L and Eberson F *J exp Med* 1918 27, 309, *Ibid*, 28, 323 5 *J Bact* 1930, 19 27 6 *Proc Mayo Clin* 1935, 10 115 7 *Ibid* 1942, 17 99 8 Gildemeister, E *Dtsch med W schr* 1933, 59, 877 9 Sabin, A B and Olitsky, P *Proc Soc exp Biol N Y* 1936, 34, 357 10 Barnard, J E *Proc roy Soc* B, 1937 124, 107

IS IT A BOGY?

Phytic acid has been referred to as a bogy,[1] which implies that it is something terrifying, mysterious and unknown This is an unkind term to apply to a product of nature and one which the natural scientists are likely to challenge Phytic acid is a compound of inositol and six phosphoric acid radicles Inositol itself has a ring nucleus of six carbon atoms, to each of which is attached an H and an OH group The compound therefore has the same empirical formula as glucose, $C_6H_{12}O_6$, and has many properties in common with the carbohydrates Phytic acid forms insoluble compounds with calcium, magnesium, iron and other divalent metals, and it is widely distributed in nature, occurring in the seeds of many plants in large amounts The elaboration of this compound, and its widespread use in the plant kingdom, has undoubtedly been one of the main factors in facilitating the dispersal of seeds, for by its use the plants can store a source of carbon, phosphoric acid and salts in a desiccated form This enables them to reduce to a minimum the water in, and hence the weight of, their seeds Phytic acid may not be so widespread in the animal as in the plant kingdom, but it has recently been detected in the red blood-cells of the goose[2] An enzyme hydrolysing phytic acid has been found in the liver of calves and in the intestine of the rat, and inositol has been known for a long time to occur in organs so far apart as the egg and the mammalian heart We do not yet know just how phytic acid functions in the red blood-cell, or what inositol is doing in the heart, but we may be sure that both of them serve some useful purpose

When man became an agriculturist thousands of years ago he began to rely on cereals for his nutrition, and willy nilly, he began to eat large amounts of phytic acid every day We could have foretold from its chemical properties what effect this was likely to have on his mineral metabolism, but as so often happens it has taken years to discover and prove facts which it seems in retrospect should have been obvious We now know that the phosphorus in phytic acid is not so freely absorbed as inorganic phosphorus, and **Harrison** and **Mellanby**[3] have shown that the incorporation of phytic acid in a puppy's diet may produce rickets This it presumably does by precipitating the calcium of the food and so interfering with its metabolism Since phytic acid is almost entirely confined to the outer parts of the grain, large amounts are found in brown bread but practically none in white, and in keeping with this **McCance** and **Widdowson** have demonstrated to the Association of Physicians that calcium and magnesium are absorbed much better from white than from brown bread diets At the same meeting they showed that white bread could be made to inhibit the absorption of calcium and magnesium, if sodium phytate was added to it They have recently announced at a meeting of the Biochemical Society that the absorption of calcium from brown bread diets can be improved if the phytic acid in the bread has been converted to phosphates and inositol, but that before brown bread can be made as harmless as white in this respect, the phosphates resulting from the hydrolysis must be removed

The war has no doubt delayed the publication of these results, but the facts are clear, and there is no doubt that something should be done to apply this knowledge, since milk-supplies are short and we are now eating a bread which contains much more phytic acid than the old white loaf The announcement by Major **Lloyd George**[4] that 7 oz of calcium carbonate is to be added to each 280 lb sack of national flour is therefore welcome

AN EARLY SYMPTOM OF RIGHT HEART-FAILURE

Pain in the right hypochondrium due to hepatic congestion has long been recognised as one of the symptoms of failure of the right side of the heart, but it was only noted when failure was well established Boyer and White,[5] however, suggest that pain in the right hypochondrium, precipitated by exertion and relieved by rest, may be a symptom of early right heart-failure Investigation of 40 patients who either had right heart failure or were candidates for it owing to the presence of mitral stenosis showed that 18 of them had had this symptom, though it was mentioned in only 1 of 1000 case-records of patients with congestive heart-failure The probable explanation for this discrepancy is that the symptom was slight or masked by other symptoms, so that the patients had either forgotten it or overlooked it in giving their history Boyer and White suggest that the symptom is due to acute congestion of the liver and is comparable to the dyspnœa on exertion which occurs in the early stages of left ventricular failure The symptom, if inquired for, might well be of value in detecting the onset of failure in patients with mitral stenosis at a comparatively early stage, or to assess the prognosis in any given case, though care would have to be taken to exclude other causes for pain in the right hypochondrium If the onset of failure is at all sudden the early stage may never develop and the persistent pain in this region which is felt in the later stage may then be the first symptom

---

[1] Bennett N *Lancet*, 1942, i, 573
[2] Rapoport S, Leva, E and Guest, G M *J biol Chem* 1941, 139 633
[3] Harrison, D C and Mellanby, E *Biochem J* 1939, 33, 1660
[4] See *Lancet*, April 25, 1942, p 517
[5] Boyer N H and White, P D *New Engl J Med* 1942, 226 217

Annotations

HEAT AND COLD AND THE GUT

THERE is a lot of superstition but little accurate knowledge concerning the action of heat and cold on digestion Cold winds often herald the return of peptic ulcer symptoms, so that March and November are bad months for these patients, and winter is the worst time, too, for the ulcerated and spastic colon Hot and cold applications to the abdomen have their advocates for various intestinal disorders, and at one time ice and iced foods were thought essential in the feeding of ulcer patients Bisgard and his colleagues [1] at the University of Nebraska have tried to establish some facts on which practice can be based Their method has been to pass into the stomach or intestine a rubber tube with a compressible balloon on its end, and to record changes in pressure on the balloon by means of a U-tube manometer connected to the other end of the tube In one case the balloon end was inserted into the ileum through an ileostomy stoma, in another into the colon through a colostomy, for the small intestine and stomach the tubes were introduced through the nose Hot bottles applied to the abdominal wall for half an hour inhibited the activity of stomach, small intestine and colon, whereas an ice pack for half an hour stimulated both tonus and peristaltic activity Heat applied to the thighs had no effect on the gut, and cold to the thighs only slightly stimulated motor activity But cold packs, whether on the abdominal wall or on the thighs, much increased the secretion of both free and total hydrochloric acid The effect of heat and cold applied internally was the reverse of that applied externally, for hot drinks stimulated and iced drinks inhibited both gastric and intestinal motility These findings must be viewed with caution, since intestinal function is highly susceptible to nervous influences, and the studies did not deal with the effects of heat and cold on the sphincters, nor did they pretend to throw light on the production or relief of spasm But they seem to have some *definite clinical applications In peptic* ulcer local heat to the abdomen should be of value by lessening gastric motility, whereas ice packs should be harmful, iced drinks, on the other hand, are triumphantly justified Hot fomentations to the abdominal wall, by lessening motor activity, should also help in inflammatory lesions such as appendicitis and peritonitis The observed responses to temperature changes were of relatively short duration, the average was about an hour and second applications produced a smaller response The studies emphasise the important controlling influence of the stomach on intestinal and colonic activity The gastro colic reflex is well recognised since it was first investigated by Hurst, and not only diarrhœa and constipation but probably some of the obscure forms of "indigestion" associated with intestinal hurry may be connected with this pace maker function of the stomach Variations in the temperature of food and drinks may influence the activity of the whole intestinal tract Hot soup, for instance, by stimulating peristalsis seems a sounder start to a meal than an iced cocktail or fruit-juice

LET THE DEAF HEAR

How should a deaf child be taught to speak? Complete deafness is not the rule, more than a quarter of these children have some small residue of hearing In learning to speak should a child, by means of amplified sounds, be allowed to make use of that residue (auricular training) or should he learn lip-reading only (oral training)? Hughson, Ciocco, Witting and Lawrence [2] have no doubt of the answer Basing their opinion on a detailed study of 366 children in the Pennsylvania School for the Deaf, 248 of whom were being orally trained while 118 were attending auricular classes, they conclude that auricular teaching is absolutely superior to oral They charted the improvement in speech of deaf children, and showed it to be progressive in those using hearing aids, whereas those taught orally showed little or no improvement after reaching a certain standard These workers point out that the most serious deviation from the normal in the speech of deaf people is their lack of expression—better described, perhaps, as their difficulty in understanding and using inflections of the voice They generally speak in a monotone Hughson and his colleagues, comparing speech characteristics in the auricular and oral groups, concluded that the speech of children taught by the auricular method approaches more nearly to that of normal children than that of children taught by oral methods They observed, however, that children taught by ear had a tendency to overemphasise certain elements of speech, the enunciation of the first consonant especially This was possibly the result of a defect in the instrument Hearing aids, especially electrical ones, often seem to produce an echo of the sound that has gone before, and thus to magnify *the explosiveness of first consonants Auricular training* was found to be superior at whatever age the deafness had arisen, though of course there was a higher standard of speech in both groups where the onset of deafness was relatively late As the children grow older, auricular training was found to maintain this superiority In England Dr Phyllis Kerridge was a pioneer in this field of research These American findings bear out her belief that deaf children can be given a normal education which will enable them to develop into independent people The *auricular method considerably shortens* the time of training the deaf child and so, *among other* advantages, is considerably less expensive than the old oral method

ONE COMMONWEALTH OF MEN

LONDON University has always *faced* one difficulty not usually encountered by universities in peace time its component colleges are so scattered through London that it is hard to maintain regular contact between them, and indeed until 1936 there was no headquarters in which all its major activities were centred With the war the task of welding the university into a whole has become still more difficult In 1939, most of the schools were dispersed to provincial universities and the dislocation of university policy and procedure thus created was formidable In a recent survey by Convocation,[1] the ways in which this dislocation has been reduced are set out Thus the court of the university, which is the supreme authority in matters relating to property and finances, has managed to meet regularly throughout the war Until this year the Government maintained its *grant at prewar* level, although the London County Council found it necessary to make a 10% cut in theirs The university senate, the supreme governing body in academic matters has been able to meet about once a term In June 1940 the senate passed an emergency statute giving the chairman the responsibility *of* deciding whether and when convocation should meet during the war, and he took it as his duty to see that convocation met in the ordinary way, determining to exercise his responsibility only if a serious emergency made meetings undesirable The dispersed schools were welcomed by their receiving universities, *despite the fact that* far greater numbers of students had to be accommodated than was at first expected Plans had been made on the assumption that the Government would call up most of the men students, but the decision not to call up those under

---

[1] Bisgard, J D, Matson, G M and Hirschmann, J *J Amer med Ass* 1942 118, 447

[2] Hughson, W, Ciocco, A, Witting, E G and Lawrence, P S *Laryncoscope, St Louis* 1941, 51, 821

[1] A *survey of the* University of London in War time Prepared for circulation in the convocation of the un

20 upset these calculations The long quiet period before the air attack on London created further difficulties many of the schools decided to come back, and in five or six cases plans for return were complete when the London air-raids began It was fortunate, convocation feel. that the raids started in the long vacation , it gave them time to rearrange their plans Students have felt the effects of dispersal financially , those who would have been able to live at home in London have had to find lodging expenses and additional train fares Nevertheless 80% of the prewar number were able to continue their studies during the first year of war , and though the demands of national service have reduced their numbers there were still 9000 internal students at the end of 1941 as compared with 11,000 in 1939–40 There have been compensations for exile ' teachers and students, hosts and guests alike, have experienced a great stimulus from working in close collaboration A heightened realisation by the students of their opportunities and their responsibilities has been reflected in their conduct and their excellent examination results "

The university has released 85 professors and readers, and a far larger number of lecturers to national service, and the dispersed schools have pooled their teachers with those of the receiving universities Even so it is estimated that the remaining staffs have been doing half as much work again as they did before the war It has been possible to answer to the full, however, the Government's call for intensive training of students in radiophysics, chemistry and engineering Examinations have been held at the usual intervals, being conducted in the receiving universities instead of in London alone Entries for external examinations held overseas have increased considerably since war broke out , during 1940, more than 4000 candidates were examined for matriculation and 1200 for intermediate, final and higher degrees Only 2 examination scripts were lost in transit —a diminutive toll which reflects credit on the Navy and the Merchant Service as well as on the university.

TEAM-WORK IN THE LARDER

The value of surveys in assessing dietetic habits and preferences was mentioned by Prof J C Drummond in his address to the Royal Society of Arts on May 6[1] Food nowadays stands first among controllable factors affecting human health, and war has favoured its planned distribution The nature of defects and deficiencies of diet can only be discovered at present by examining the health, diet, social and economic circumstances of a group of people The diagnosis of full health cannot be made by clinical methods alone, since in general characteristic signs of nutritional disease are evidence of the advanced, sometimes incurable, results of long-standing dietary deficiency Early clinical manifestations on the other hand, are not specific thus, follicular keratosis cannot always—or even often—be attributed to deficiency of vitamin A, nor gingivitis to deficiency of vitamin C Nutritional experts agree that for the early diagnosis of malnutrition laboratory methods are essential , but these methods are difficult to apply satisfactorily because the techniques are complex, and unless they are carefully carried out they are untrustworthy and unspecific Their application in fact demands a large and skilled team Professor Drummond mentioned the Oxford Nutrition Survey team which consists of clinicians, biochemists and dietitians who aim to furnish reliable information about the state of national nutrition to the Ministry of Health Surveys are of two kinds detailed studies of the nutritional level of population samples, and quick surveys to acquire facts of immediate public health importance In either case examination includes clinical and biochemical methods and such specialised techniques as biomicroscopic examination of the eye and measurement of dark adaptation

Work of this kind is not required only in war-time Professor Drummond hopes to see teams such as this rushed into territories as soon as they are liberated from the enemy, so that they can survey and advise on the nutritional conditions of the freed people, and study in a scientific manner deficiency conditions that should never occur again Moreover when peace comes the public health authorities will go on needing information about the nutritional state of the people and nutrition surveys can give it them Teams could also undertake research in the science of human nutrition which Professor Drummond foresees as necessary to settle old controversies about diet and the incidence of disease Does a high protein intake, for example, really injure health ? Do peasants living on vegetables, coarse bread and goat's milk really suffer little from digestive disorders ? Nutrition teams could quickly give the answer to these and many other questions

WHOLE MAN

Thirty years ago, having diagnosed a case as functional, most physicians lost interest in it They saw a clearcut line between organic disease which they respected and functional disease which they despised Marshall[1] tells how one of his teachers used to set out fifteen points distinguishing organic from functional nervous disease leaving his hearers with the impression that the two were mutually exclusive But in 1918 Hurst, as Marshall reminds us, emphasised the hysterical symptoms which may gather about organic nervous disease or injury , and with the growing study of psychological medicine since then our conception of organic and functional illness has changed We are beginning to notice that even an organic disease attacks not a system but a man and that the form it takes will inevitably be influenced by the type of man it attacks , we are finding too, that a troubled mind can damage an organ—that there is, for example, a functional element in the ætiology of gastric ulcer and rheumatoid arthritis We have discovered that a worker can even be " accident-prone because of his psychological peculiarities From time to time it is worth recalling what we mean by a functional phenomenon Marshall defines it as a disturbance of physiological process which is not due to any known pathological lesion of the body The operative word is " known " He reminds us that Parkinson s disease and chorea were classed among " general and functional diseases " in the 1912 edition of Osler s " Medicine " The distinction is as false as that between primary and secondary amentia If we see functional and organic disease as distinct we are always in danger of making a grave mistake Where the predominating symptoms are those of a psychological illness gross organic signs may be overlooked, as the cases reported by Hulbert in this issue demonstrate Or by concentrating on minor organic disease we can create or augment serious neurosis Had we been taught early to think of man as a whole this could not happen To split up diseases and systems is a useful teaching method but synthesis should share the field with analysis Nor is it in medicine merely that we have failed of late to see man whole, Sayers[2] points out that we habitually split him into abstractions, as " rational man " " economic man ' or " theological man —creatures who can have no absolute existence and whom we must now fuse again if we are to make a society in which whole man can go decently about the business of living All we know about thought, according to Sherrington is that it lies outside the space-energy concept , but whatever it is we have evidence enough that it can affect the thinking creature whether the result becomes manifest in symptoms classed as functional or as visible damage to an organ To leave the functional aspect of any disease out of consideration is to cry "I give it up" to half the riddle In medicine we are not at liberty to give it up

---

[1] See *Lancet*, May 16 p 598

[1] Marshall R *Ulster Med J* 1942 11 62

[2] Sayers, D Begin Here London 1940

THE BEAST WITH FIVE FINGERS

"WHEN Adam delved and Eve span, who was then the gentleman ?" runs John Ball's old jingle, an early complaint of the social cleavage into a leisured class and the manual worker In the history of civilisation the first advances towards the mastery of nature were made by the manual worker, who gave his fellows first the necessities and then the luxuries which gradually transformed life on the earth But in the process of time those, honoured as demigods and heroes, who had bestowed such benefits on their fellow men fell from their original status, their descendants the manual labourers became the despised and downtrodden class, and first the warrior and then the wealthy assumed a superior position In Greece this social cleavage took place early—witness the unanimous testimony of Herodotus, Xenophon, Plato and Aristotle Prof Benjamin Farrington has examined the effect of this social change on the science of medicine in a lecture at the Royal Institution last December His thesis is that the prejudice against the mechanical arts in Greece led inevitably to a sterilisation of progress in the mastery of nature The theorist, divorced from practice, gradually lost the knowledge which could only be derived from the work of the hand and the practice of an art Medicine, since it is a practical art essential to the well-being of the state, was slower to lose its status than other branches of knowledge and it was not till late in Greek history that the actual practice of the anatomist and the surgeon surrendered to the attacks of the theoretical philosopher In other sciences the chains of a dead metaphysic paralysed and prohibited all new effort, and even medicine at last succumbed to authority He shows how this was realised and resisted by Hippocrates and Vesalius, and hails the Italian Ramazzini as the first physician to study diseases afflicting the handicraftsman He mentions Paracelsus, but hardly does justice to that great man, whose protests against neglect of the study of occupational diseases antedated those of Ramazzini and Vesalius by at least a century Farrington does not suggest that the hewers of wood and the drawers of water can disappear from the modern social state, that is a dream of a future existence in which the mechanic will be replaced by a robot There must remain grades and degrees of esteem in the varied occupations of men Equality of opportunity is an attainable ideal, equality in a man's worth to the state must be for ever unrealised In our own profession the wheel has come full circle and the worker with his hand, whether in the theatre, the laboratory or the wards, is valued more highly than the theorist

PROGNOSIS IN LYMPHATIC LEUKÆMIA

IN the myeloid leukæmias the distinction between the acute type, rapidly fatal and unamenable to treatment, and the chronic type with a much better prognosis is relatively easy, for both the clinical and hæmatological findings are well contrasted But in lymphatic leukæmia the types are not so clear-cut, and the blood-picture is not so easily interpreted There is the acute lymphatic leukæmia with rapid onset and a large proportion of recognisable primitive lymphoblasts in the blood, rapidly fatal and almost entirely limited to children The difficulties arise in the lymphatic leukæmia of adults Besides the classical variety with enlarged spleen and lymph-glands, high leucocytes count—mostly classed as lymphocytes—and good response to radiotherapy, there are a whole set of border-line syndromes, such as patients with enlarged lymph-glands showing the histological features of lymphatic leukæmia but without significant blood changes, or the old style lymphosarcoma with, say, a mediastinal mass and blood changes not present at first but coming on later, and there are other syndromes of this nature Since 1936 B K W in the United States has maintained that there two types of lymphocytic leukæmia (i e, exclu lymphoblastic), one neoplastic and one non neoplas possibly metabolic He described morphological differences between the neoplastic and the non-neoplastic lymphocyte, but these were not easy to follow and have not so far gained general acceptance. Recently Bethell[1] using a technique described by Raphael Isaacs which utilises a preliminary supravital staining with brilliant cresyl blue before the usual Wright's (or other Romanowsky) stain, claims to have made the distinction between lymphocyte, lymphosarcoma cell or neoplastic lymphocyte, and lymphoblasts much clearer He has nothing new to say about lymphoblastic leukæmia Lymphocytic leukæmia he finds affects males more than females and occurs almost exclusively in the middle and later years of life, is relatively benign and responds well to radiotherapy Lymphosarcoma cell leukæmia affects mostly males at all ages and its prognosis is much worse, some respond to cautious radiotherapy and this should always be tried whatever the total leucocyte count Wiseman[2] has also recently extended his observations on the clinical occurrence of lymphosarcoma and has emphasised the importance of sternal puncture for the early detection of the characteristic cells in otherwise obscure cases He describes three common types of clinical onset—severe anæmia often without associated enlargement of glands or spleen, hæmorrhage or purpura, and acute abdominal symptoms, and there are others In all his 66 cases bone-marrow biopsy was needed to settle the diagnosis The prognosis appears to be poor even with radiotherapy Wiseman further points out that there is also a group of patients with lymphoid tumours, little or no anæmia and no striking changes in the blood leucocytes, in whose bone marrow a high percentage of normal lymphocytes are found Similar cases were described in this country by Israëls[3], they respond well to radiotherapy and are often very chronic with good prognosis

Evidently if we wish to read the prognostic riddle we must look more closely at the "lymphocytes" of blood and bone marrow, but all the workers agree that in this, as in so many hæmatological problems, all the evidence, clinical and pathological, must be considered together to get the best results

---

SIR THOMAS OLIVER, the father of industrial medicine, died on May 15, having just entered his 90th year In the Newcastle school of medicine he had held the chair of physiology (1889–1911), the chair of medicine (1911–27) and the presidency of the college He was vice chancellor of Durham University 1928–30

---

1 Bethell, F H J Amer med Ass 1942, 118, 95
2 Wiseman, B K Ibid, p 100
3 Israëls, M C G Brit med J 1939, ii, 1132

PARASITIC DISEASE OF THE HEART—E G Carrillo (*Arch lat-amer Cardiol Hematol* 1941, 11, 235) deals with the rare group of cardiopathies due to parasitic infestation, and particularly with the cardiac lesions of Chagas's disease, the result of infestation of the myocardium by the *Trypanosoma cruzi* Some cases of Chagas's disease develop acutely, with tachycardia, extrasystoles and hypotension X rays show moderate enlargement of the heart Electrocardiograms are inconclusive Sudden death is comparatively common Autopsy shows acute inflammatory and degenerative changes in the heart muscle In other cases the disease runs a chronic course and is difficult to distinguish clinically from rheumatic carditis Histologically changes are found in the myocardium, but laboratory methods of investigation are usually necessary to differentiate the two conditions during life

Special Articles

FUTURE OF OBSTETRICS[*]

J M MUNRO KERR, M D GLASG, LL D, F R C O G

PUTTING aside the toxæmias of pregnancy, the treatment of functional diseases, and improvement of surgical technique, the problems which concern us particularly *t the moment are* the maternal death-rate, and isability resulting from pregnancy and childbirth, he stillbirth and neonatal death-rate, abortion, birth control, and the falling birth-rate

There has been an appreciable fall in the maternal death-rate from *sepsis* in the last year or two in England and Wales

Year	*Death rate per* 1000 *live births*
1925–30	1 7 (average)
1936	1 39
1937	0 98 (lowest on record)

How much further the death-rate from sepsis can be reduced is impossible to predict The pronounced lowering is mostly due to the sulphonamides, to more thorough aseptic technique, and to the better training of midwives That progressively increasing numbers of women are being treated in maternity hospitals may also be a factor

The death-rate from *other causes* has not improved comparably

Years	*Death rate per* 1000 *live births*
1925–30	2 5 (average)
1936	2 41
1937	2 28

The toll of deaths from the toxæmias, hæmorrhage, and complications and accidents of labour (which include the bulk of the complications in this group) is much too high, in spite of the many antenatal clinics established by local authorities Antenatal care is still inadequate The medical staffing of antenatal clinics under local authorities is often unsatisfactory Those responsible for such clinics are out of touch with the practice of obstetrics, since ultimately the patients are attended by midwives or other doctors Deaths due to placenta prævia and accidental hæmorrhage might well be lowered if the patient was placed in an institution staffed by specialists on the first evidence of hæmorrhage or other untoward symptoms, and similar care would reduce deaths from accidents and complications of childbirth Many fœtal deaths are due to the faulty technique of a doctor inexperienced in obstetric practice

Deaths of women not classed as due to pregnancy and childbearing, but returned by the Registrar General as *associated with them,* show no decrease in recent years

Years	*Death rate per* 1000 *live births*
1925–30	1 21 (average)
1936	1 10
1937	1 24

Supervision of pregnancy and institutional treatment under experienced obstetricians and physicians would reduce deaths due to influenza, pulmonary tuberculosis, heart disease and chronic nephritis

There is no means by which we can compute exactly the injuries, chronic infections of uterus and tubes, functional disabilities and ailments due to pregnancy and childbirth *McIntyre in an analysis of 7734 patients* treated in the Royal Samaritan Hospital, Glasgow, found that the chief ætiological factors were puerperal infection, 28 1%, trauma in childbirth, 35 3% This unfortunate legacy from childbirth can only be reduced by more assiduous antenatal and intranatal care—"good obstetrics is preventive gynæcology"

STILLBIRTHS AND NEONATAL DEATHS

Since 1900 the infant death-rate for England and Wales has fallen from 140 to 55 per 1000 live and stillbirths, but the stillbirths and neonatal deaths have diminished only very slightly The 8 1% of deaths due to malformations possibly cannot be lowered, but the fœtal deaths from prematurity and from injury during birth can be reduced by improved antenatal and intranatal care[1, 2]

RATES PER 1000 LIVE AND STILLBIRTHS
(Actual numbers for 1937)

Year	*Stillbirths*	*Neonatal death-rate* (0–4 *weeks*)	*Combined rate*
1928	40 1	29 8	69 9
1929	40 0	31 5	71 5
1936	39 7	29 0	68 7
1937	(24,806) 39 0	(18,168) 28 6	67 6

As regards abortion I am convinced that it is undesirable to press for notification of cases, and that it is advisable *to leave the law governing abortion* as it is At present there is a freedom of action left us which we would never enjoy if the circumstances under which therapeutic abortion was to be performed were defined by Act of Parliament

Birth control constitutes a danger to the country in which it is practised to anything but a moderate degree In England and Wales this danger is obvious.

BIRTH-RATE PER 1000 POPULATION

1881–90 (average)	32 4	1939	14 9
1921–30 (average)	18 3	1940	14 6

Obstetricians can play a part in counteracting the danger by doing everything possible to save fœtal life' This can only be accomplished by means of a national maternity service in which obstetricians and the public-health service with all its ancillary agencies (pædiatricians, family practitioners and midwives) are in full and sympathetic partnership

THE FUTURE

It is probable that obstetricians and gynæcologists in the near future will be concerned with organising such a maternity service Its aim will be to ensure safe conduct during pregnancy and childbirth for the expectant mother and her child Those most experienced to carry out this work are obstetric specialists and highly *trained midwives*

Expectant mothers can best be treated during labour, and if the need arise, for any complication in pregnancy, in a well-appointed maternity institution At the moment it is a practical impossibility to provide institutional treatment for all, but in peace-time it is feasible and is being approached in a number of cities at home and abroad It would require a total of beds in the region of 25,000–30,000 for England and Wales This means taking away obstetric practice from general practitioners The specialty of general practice is as important as other specialties but like all of them it has its limitations For more than twenty years I have tried to persuade my colleagues in general practice that it is in the interests of pregnant and parturient women, and to their own advantage to hand over obstetric practice to specialists They, in general, have obstetric specialists to look after their wives—in one single year I attended the wives of 23 general practitioners Obstetricians agree that maternity hospitals should be units *of general hospitals The staffing of these hospitals or* units, of the antenatal clinics associated with them, and of the antenatal clinics of local authorities, by specialists responsible for antenatal and intranatal care would be simple in large cities The position in small towns and sparsely populated rural areas is very different In these—it has been done already in some areas—the local practitioners should select some of their number for maternity work Those selected would be expected to undergo special postgraduate training and take a diploma in obstetrics

The administrative bodies of the region will be the local authorities with the Ministry of Health as the central directing body Agreement in respect to the constitution and personnel of the regional bodies will probably be reached comparatively easily, a good deal of spade work has been done already by the BMA Medical Planning Commission and other bodies For the central directing bodies I advocate two ad-hoc bodies with executive powers, to be designated the Central Obstetric Boards of the Ministry of Health for England and Wales, and of the Department of Health for Scotland We should not be put off with an advisory committee , such committees have no authority, and their views, though received with the greatest courtesy, are usually filed and forgotten The central obstetric board for England and Wales should be representative of all concerned—Ministry of Health, regional and local authorities obstetricians (nominated by the Royal College of Obstetricians and Gynæcologists), general practitioners (nominated by the British Medical Association), midwives (nominated by the College of Midwives), insurance commissioners, and possibly representatives from other bodies The board for Scotland would be constituted on similar lines The chairman should be the permanent secretary with the chief medical officer of the Ministry of Health as vice-chairman , in Scotland a similar arrangement should be made at the Department of Health Some might prefer an independent chairman, but there are obvious objections to that arrangement My scheme for a national maternity service was first published in 1931,[3] and my views are in the main the same today Every year that passes some come nearer fulfilment, but I have seen no promise of the creation of a Central Obstetric Board Obstetric specialists, family practitioners, midwives, and voluntary hospitals would have to make considerable sacrifices should a national maternity service be established. They have such an abhorrence of bureaucratic control that they all hesitate to give it their support, but if the directing body was representative of all the agencies working in the service, objectors might be persuaded to cooperate, even with enthusiasm

---

[*] Extracts from the presidential address, given on Jan 16 to the Section of Obstetrics and Gynæcology of the Royal Society of Medicine in the *Proceedings* of which (1942, 35 375) it can be read in full

[1] Baird D and Wyper, J F B *Lancet*, 1941 ii, 657

[2] Titmuss R. H *Ibid* 1941, ii, 746

CONTROL OF SCABIES

From the end of the last war until about 1936 scabies was gradually disappearing, but since 1936, for reasons unknown, it has increased again, and during the war has become widely prevalent The Minister of Health therefore arranged for and financed research to clear up some obscure points about the disease , this was undertaken by Mr Kenneth Mellanby, Ph D , at the Sorby Research Institute, Sheffield, and has since been taken over by the Medical Research Council In the autumn of 1940 conferences were held under the chairmanship of Dr A H M Gray, the president of the Royal Society of Medicine, with representatives of the Services, and an Advisory Committee on Scabies was appointed, on which the American Red Cross is now represented In November, 1941, after requests from local authorities for further powers for the control of scabies, the Minister of Health made an order, under Defence Regulations, providing for the inspection of premises in which persons found to be verminous are or have been living, for the examination and, if necessary, treatment of any other persons on those premises who may be verminous, and for any necessary cleansing or destruction of articles on those premises

Dr Mellanby's researches indicate that direct personal contact with an infected person is the chief factor responsible for the spread of the disease , the part played by clothing, bedding and towels is not yet clear and is to be investigated

RECOMMENDATIONS

In a white paper just published (Cmd 6355 Prevalence and Control of Scabies H M Stationery Office Pp 4 1*d*) the recommendations of the advisory committee as to treatment, disinfestation and exclusion of children from school are summarised as follows —

There are several effective methods of treatment for scabies but benzyl benzoate emulsion (25%) is the preparation of choice, and for uncomplicated cases of scabies the treatment of patients during the war should be standardised as far as possible

(*a*) The patient is first given a slipper bath in which he is told to soak for ten minutes, alternatively a shower bath for five minutes would suffice He then soaps himself freely, using if necessary a rough flannel but not a scrubbing brush, and rinses the soap off

(*b*) The patient is then dried, and, in a room adequately warmed, benzyl benzoate emulsion is applied over the whole body, from the neck downwards, with an ordinary flat paint brush 1½–2 in wide The application is allowed to dry and the patient puts on clean underclothing

(*c*) Two such treatments should be given, either on successive days or within a period of eight days

Where a case of scabies occurs in a house the family should, if possible, be treated at the same time

Clothing—particularly clothing worn next to, touching, the skin—and articles of bedding with wh patient comes in contact, such as sheets or should be properly disinfested if the necessary apr is available Otherwise, underclothing, towels and at least should be washed and aired and outer clot ironed with a hot iron Blankets should be ironed hung in a warm dry place for two days

After the first treatment with benzyl benzoate there is no medical reason for excluding an uncomplicated case scabies from school

LUMINOUS PAINTS

PROTECTION OF WORKPEOPLE

Instruments with luminous dials are needed in night operations of the Armed Forces, especially of the R A F, and consequently luminous paints have been used in greatly increased amounts since the beginning of the war Most types of luminous paint contain radio active substances such as mesothorium, the emanations from which consist of alpha, beta and gamma rays as well as radon gas, and all of these have harmful effects on th body The law of Arndt-Schultz states that X rays an radium excite a living cell with a feeble dose, inhibit with a moderate dose, and destroy it with a strong do Beta particles penetrate the skin and cause severe burn which heal slowly and in extreme cases become cancerou The gamma rays, the most penetrative of the radiations affect the blood-forming and reproductive system A small amount of radio-active substance entering th body over a period of years may prove as dangerous as larger amount in a short time The results are no immediately apparent and four or five years may elaps before the deposited radium brings about necrosis o bone, cancerous conditions, and varying types of anæmia Blood-counts become significant when there is a sub stantial diminution of the number of red cells associate with a high colour-index, when the polymorph count fall below 3000 and lymphocytes below 1500 per c mm The dangers of handling luminous paints were firs forcibly brought to notice in 1923, when women employe in the USA in luminising watch dials developed sever and sometimes fatal illnesses as a result of rarefyin osteitis of the jaw (resembling the phossy jaw of phos phorus poisoning), osteogenic sarcoma and anæmia These women had been applying luminous paint to the watch dials with fine camel's-hair brushes which they pointed with the lips, and it is thought that the speci effect on the bones was due to the alpha rays, which are only weakly penetrative, coming from the ingested radium sulphate A chemist who had mixed the paint and who had been exposed to the radio-activity in the air of his laboratory died from aplastic anæmia but did now show bone lesions

The precautions that must be taken in the handling of luminous paints are illustrated by the comprehensive health regulations called the Factories (Luminising) (Health and Safety Provisions) Order, 1942, which came into force on May 3 This is the first set of health regulations issued since the Factory Department of the Home Office was transferred to the Ministry of Labour, and the actual order has been made under the Defence Regulations and not under the Factories Act Another interesting point is that if people who are doing luminising in a factory are not " employed in the performance of services essential for the defence of the realm or the efficient prosecution of the war or essential to the life of the community " the occupier of that factory may apply to be exempted from the provisions of the order It can be assumed however that all luminising now being done here will be on instruments for the forces The regulations are designed to protect the workers from actual contact with as well as from the radiations coming from the radio-active substances, and to prevent them swallowing the paint or breathing radio-active dust and radon gas The storage of the stocks of radio-active materials is also regulated The provisions include that no person under 16 years shall be employed in luminising and that no-one shall do such work for more than 48 hours a week The room in which luminising is done shall be used only for that purpose and the floors and work-benches shall have smooth impervious surfaces and be washed every

---

[3] Kerr, J M Munro *J R sanit Inst* 1931, 52 Analysed with other schemes in *Lancet*, 1931, ii, 367

a) Adequate space at the work-bench is to be rovided for each worker as well as suitable seats with ack rests Exhaust ventilation is to be installed at each orking place at the bench, and glass screens must be rovided to keep the workers' faces away from the work he use of brushes for applying the luminous paint is rohibited Protective clothing, consisting of overalls, air-coverings, rubber aprons and gloves, is to be rovided The overalls and hair-coverings are to be ashed weekly and the aprons and gloves are to be leaned every day by a wet method When the protecive clothing is not being worn by the workers it must be tored in a special place separate from other clothing Adequate washing facilities and clean towels, soap and ail brushes have to be provided and each worker is llowed 10 minutes in which to wash before taking a meal nd at the end of each day's work The receptacles for he luminous paint actually being used at the benches are to be constructed so as to prevent as far as practicable contamination of the workers' fingers by the paint In addition the bottles for holding the paint are to be put in containers lined with lead 1 in thick or iron 2 in thick Wet sponges are to be provided for removing waste material containing luminous paint To prevent contamination of the benches with radio-active material special holders or stands are to be provided, on which to put the instruments for applying the paint The workpeople are prohibited from bringing into the luminising room any food or drink, cigarettes or tobacco, or cosmetic substances which have not been previously applied Every person employed on luminising has to be examined by a doctor, who will either be the examining factory surgeon or another doctor appointed for the purpose, within a week of beginning work and thereafter every three months The doctor will have power to suspend any worker on health grounds from doing luminising Stocks of the luminous compound are to be stored under lock and key in such a place that no person comes within 10 ft of the store except when taking out or replacing supplies of the compound If the storage receptacle has a lead lining 1 in thick or an iron lining 2 in thick, the distance may be reduced to 3 ft As a further precaution the storage receptacle must itself be efficiently ventilated if it contains more than the radio-active equivalent of 7 mg of radium Supplies of the luminous compound are only to be taken from the store by a responsible person and in small quantities for immediate use Even then the small supplies must be put into closed bottles which are placed in covered containers lined with lead (1 in thick) or iron (2 in thick)

It is clear that if these rigorous regulations are faithfully observed—and most of them, including regular blood examinations, have already been voluntarily adopted in factories in this country—little or no risk to the health of luminisers need be anticipated

THE MAGIC LEY

MANY who are not farmers have had practical experience during the last two years, after digging up the lawn for victory, of the fertility that lies latent in grassland When we come to plant the lawn again we shall find how much better it grows for the two or three years cultivation of vegetables This is a small example of ley farming, sometimes called alternate husbandry or "taking the plough round the farm " Sir George Stapledon —who has shown what advantages follow the intelligent periodic ploughing up of grassland—and Mr William Davies in a recent Penguin book (Ley Farming, Pp 160 9*d*) tell how it can benefit British agriculture The latent fertility of permanent grassland will enable us to produce additional cereals and other direct human foods, improve the country's milk production through better grass and clover crops, increase our quantities of hay and silage, and reduce diseases in live stock On many farms now every grass field in turn is being ploughed up, two or three arable crops are taken from it, and it is then being seeded with better clover mixtures This herbage will stay down for two or three years, carrying more stock than it had done before ploughing up and steadily accummulating humus and fertility, it will then be ploughed again, its rotting sod providing an ideal fertiliser for the next two or three more arable crops Those who wish to follow a revolution in British farming now taking place before our eyes will read this little book

In England Now

A Running Commentary by Peripatetic Correspondents

"WAR-TIME operations increase the opportunity and the excuse for secrecy" So without fear of contradiction, spake a leading article of the *Lancet* recently. My experience of war-time government is certainly that the opportunity is seized with open arms (sealed lips, perhaps, would be better), whether there is excuse or not And it inevitably defeats its object thereby and sets in train a never-ending scale of secrecy "Confidential" one ceases to take any notice of, you can leave such documents anywhere, the lowest spy ever conceived by William Le Queux would not bother to look at them "Secret" one ought to lock up and will if one remembers, "most secret" and "the property of His Britannic Majesty" must be treated with proper respect And there must be still higher points on the scale which cross the horizons of the all-highest only I wonder what they label such papers and what they do with them The best example of this inane lust for large red letters that has come my way was my receipt from a ministry that shall be nameless of a registered letter containing a typed document solemnly labelled 'SECRET Extract from the *Daily Telegraph* of July 15" Once one has embarked on the path it may prove difficult too to keep within its rigid bounds Glancing a few days ago at the skimpy war-time report of the MOH of one of our large towns I noticed that at the present time it was held inexpedient to divulge the population of his city Yet the report ended neatly with a table of the absolute number of deaths during the year from most of the ills to which the flesh is heir and the corresponding death-rates per 1000 persons living Puzzle if 0 25 persons died per 1000 living and there were 12 deaths in all how many persons living were there ? Even Funf could do it

* * *

The phrase "the changing face of England" has taken on a new significance these days In this lovely corner of the Home Counties almost every day witnesses yet another patch of green changing to the deep brown of the tilled soil I can well believe the official statements that the conversion of grazing to arable soil has now reached its limits Throughout the winter the plough has been busy all round us and even within the last few days more fields of pasture have been ploughed up, so that the view from my window, which last summer was one mass of green, is now a vista of rich deep brown interspersed here and there with a few green fields There is something reassuringly fundamental and stable about the tilled earth The green field may be more æsthetically pleasing, especially on a glorious April day with the scurrying clouds producing an ever-changing kaleidoscope of shadow, but Mother Earth, unadorned with the green of the grass or the colour of the flowers, strikes a deeper note in one's sensorium, for here we have the beginning and end of everything, combined with the promise of harvest It has been my fortune to have my lot cast this war in the country and I find it wonderfully soothing I would not give up my regular visits to London and when I first drive through town on a lovely sunny morning I feel that urge to return permanently to her which few people who have lived in London ever lose, but as the day advances and I pass through the crowded thoroughfares of the West End, thronged with women as keen as ever on "bargains," see the crowded restaurants and read the scare headlines of the evening papers I am inwardly glad that before night falls I shall be back in the country It is not fear, did my work lie in this or any other town I should willingly stay Rather is it that in the country things are seen in proportion The grimness of war is balanced by the beauty of the scene Here there is permanency and promise of better things to come instead of shattered buildings, shattered lives and promise of yet more trial and tribulation This is the same scene as our ancestors viewed just over a century ago when their husbands and sons were on guard just over those lovely downs which bound our vista in the distance Details of course have changed Horses are seldom seen It is only occasionally that I see that loveliest of silhouettes the farmer with his plough and pair The tractor is seen and heard everywhere, driven as often as not by a young woman in the uniform of the Land Army. But even the internal combustion engine seems to have lost some of its unpleasant attributes when harnessed to the soil. The tank may rock and roll past one with its deafening roar and shattering vibration but the tractor seems to do its job quietly and sedately. Even on the road the horse is a rarity—the tractor now pulls the harrow or the load of swedes from one part of the farm to the other or from farm to farm. Perhaps saddest of all the old-fashioned scarecrow, complete with clothing and hat, is now replaced by a mere post with white rags tied to it.

Even should this hitherto unscathed countryside become a battleground one feels that in the end Nature will be victorious, she alone is immortal and can quickly cover up the scars of war. My solace would be even greater if I could believe that in the days of peace my fellow-countrymen will be able to have the same experience and that the Utopian dream of a post-war England with planned cities and a populace trained to enjoy and not abuse the countryside will come true.

* * *

It is not every day one finds the meek and lowly being exalted to prominence in official and scientific circles, and much of the acarus's meteoric rise to fame has, I suspect, been attained by a species of back scratching. Here we have a minute piece of living matter with an Order all to itself made under Regulation 33A of the Defence (General) Regulations, 1939. The mite has become mighty and one wonders what he or she feels about it. There is certainly something of the snob about her. From being the old-fashioned acarus she is now *Sarcoptes scabiei*, var. *hominis*. Those of us who are interested in biology are eagerly looking forward to the more intimate story of this little lady's activities which the Ministry of Health pamphlet promises us. She seems to be another of Nature's wonderful mothers even though we are told that she loses herself or gets strangled in the hispidity of blankets, and that she cannot amble over the barren fields of sofas and armchairs to find a new camping ground for her expected family. This, however, from our point of view, is all to the good for she is most certainly a Quisling, enjoying our warmth and feeding on our store, yet all the time sabotaging our energy. How can we deal with such a foe? The Ministry of Health recommends sulphur ointment or benzyl benzoate. For a frontal attack we know these are effective. One wonders, however, if we might not also employ guerilla tactics by giving brimstone internally and gassing her galleries with sulphuretted hydrogen. She would then find herself fighting on two fronts.

* * *

The great baths controversy is drawing to a close after a struggle enjoyed by all, as the result in any case was of benefit to the troops. Both sides have won, faces have been saved on an Elizabeth Arden scale and the Works and Bricks have opened a new file, leaving everybody peaceful and contented. The game opened, as all good matches do, with little fuss, a small entry in the sanitary diary (usually the sanitary dreary) mentioning the fact that baths were overflowing down the waste pipes during bathing hours, causing a large sweet-scented nuisance around the huts. This item was picked out by a discriminating eye from its duller neighbours and given star status by the unit CO. Thus dignified, it passed to the Works and Bricks for immediate attention—i.e., sometime before Xmas—together with a recommendation that King Canute should be called in as an emergency water consultant. Works and Bricks remained firm, saying no bath need overflow and their outlet pipes were adequate and lovely (these are, in the specification). We replied, saying the flooding does occur, therefore the outlets are wrong. Now we realised a major issue was presenting itself and a conference was necessary, to take place some seven floods later. Admitted, if a WAAF filled the bath to the specified 4 in from the top it should not overflow, but what about a small bath and a large WAAF breathing deeply, or a coy WAAF who keeps the bath overflowing, suspicious of Peeping Toms at the other end of the outlet pipe? Could we have bath-huts graded to size of WAAF with a measure on the door to provide a displacement index based on height, weight and waist measurements? (No! Not on the specification, W. & B.) Or an automatic lifting waste pipe? (Also not on specification.) On their mettle, the Works and Bricks produced a piece of pure research. A self conscious airman in regulation bath order was immersed in a regulation bath with no undesirable flooding and this provided the necessary stimulus to thought. We have decided to paint three lines on the inside of bath tubs ("Brown's lines" a la Plimsoll), showing the level of filling for (1) XX outsize, (2) normal, (3) small ladies, WAAF. All the hard and useful work of his career will be forgotten, and our CO will go down to posterity as someone connected with some water business—and he hates it.

* * *

It was pleasant to revisit Ann Hathaway's cottage after an interval of thirty years. The day was balmy and spring-like, a pair of jackdaws was building in the chimney, and it struck me that the old place had not changed much. The lady guide told us that in a normal year some sixty or seventy thousand persons visit the cottage. We were shown the buttery, a black-jack, a rushlight-holder (the precursor of the candlestick), a flint and steel, and the rush mattresses on the beds. The guide related how she had explained to a party of American visitors that Ann's bedroom led off the parental bedchamber and that there was no other way of entering or leaving it except through a strait and narrow window. "That'd cramp your style, I guess," was the dry comment of a girl in the party who had apparently been paying no attention. Many of the treasures in Will's house have been removed to a safer place for the duration but the guide showed us the desk that Will is said to have used at Stratford Grammar School with the words "*Nullum emolumentum laboris*" hacked out on the lid perhaps by Will himself in an hour of disillusion. I was sorry subsequently to find all this firmly debunked in Mr J. Dover Wilson's admirable little book "The Essential Shakespeare", but, on the other hand, I was glad to find him also debunking that awful little bust of Will, looking like a smug and successful pork butcher, in the Church of the Holy Trinity. The most interesting feature of Mary Arden's house at Wilmcote is the growing museum of antique agricultural implements in the farm-buildings behind the manor, for that it was a manor the dovecote bears witness. We saw five of the plays (with the best of Sheridan's comedies thrown in for good measure) and enjoyed the versatility of Mr Baliol Holloway who stole all our sympathy as Shylock and even some of it as Caliban. We agreed that if Caliban merely typified the spirit of evil he deserved all he got but if he were human he should surely have been referred to a psychiatrist working in conjunction with an endocrinologist. The lovely and intelligent Miss Margaretta Scott—equally at home, it seemed, as Lady Macbeth or Rosalind—lunched one day at our hotel. The mother of three adoring flappers was hastily dispatched to ask for her autograph. Never have I seen a greater agony of suspense on three young faces until the request was graciously granted. Pleasant also was it to renew contact with a punt-pole on the Avon and to find that one's hand had not lost a cunning damply acquired during a not altogether misspent youth on the Thames and Cherwell. In these circumstances it was especially gratifying to hear an officer on leave, who was learning to punt, saying "Yes, I don't mind having a crack at it here but I wouldn't care to be seen doing it at Oxford where they know how to do it properly."

* * *

In the days of the raids, which are now acquiring such a halo, patients in our hospital were all issued with basins. The idea, which fortunately was never seriously tested, was that they would hold these basins inverted over them throughout the period of danger and thus ward off broken glass. But now this plan has been abandoned, largely because of one odd old man. He came in out of a taxi, and forthwith, performing the curious trick of the aged in hospitals, went pleasantly crazy. He would walk out of the ward in pyjamas on the ground that he had a dinner engagement, sit up in bed and applaud vigorously from the front row of the stalls, once, to a houseman who inadvertently remarked that he was bats, he replied "Ce n'est pas moi, c'est toi." Naturally he received his basin like everyone else, at the hands of our sweetest nurse. Imagine her shame and horror when she heard the echoing sounds of an old man urinating into it. She ran back. "No, no," she said. "It's not for that. It's to put on your head." And with a look of surprise he immediately put it there.

Letters to the Editor

WHY NOT AN ADOLESCENTS HOSPITAL ?

SIR,—The letter by "A looker on" in your number of May 9 begins with the statement "Children's hospitals are special hospitals" and classes them with urological, ophthalmic, dental and mental hospitals This seems to be a prevalent view of the status of children's hospitals but it is not in accordance with fact

In the first place, children's hospitals are not special in the sense that they confine their work to one disease, such as tuberculosis or cancer, or to one part of the anatomy, as is the case with ophthalmic, urogenital and other special hospitals They treat all forms of disease, the only limitation is that of age Indeed many of the general hospitals might equally be called special, since for all practical purposes they confine their work to adults to the exclusion of children Secondly, in many ways children's hospitals are more general than the adult general hospitals, for to many of the latter, cases of tuberculosis and pneumonia are not admitted, while in children's hospitals the treatment of these diseases forms an important part of their work Finally, the work they do should be regarded as of much greater importance than that of the adult hospitals They are chiefly occupied in the treatment of acute and curable disease in a section of the population on which the future of the nation depends, while the general hospitals are largely engaged in treatment of the degenerative diseases of the aged and chronic sick

Royal Hospital for Sick Children
Glasgow GEOFFREY B FLEMING

SEVERE GASTRIC HÆMORRHAGE

SIR,—The very interesting paper by Drs Izod Bennett, James Dow and Samson Wright on severe hæmorrhage from stomach and duodenum deals adequately with the problem of mild and moderate hæmorrhages but is scarcely adequate for the really profuse hæmorrhages

Blood transfusion is obviously of the utmost importance, but if a leak is present due to erosion of a fairly large artery it is equally important to close it, otherwise the blood never remains long enough to prevent gradual and progressive tissue changes which will inevitably become fatal The prognosis does not depend only on the amount of blood lost but also on the rapidity of its loss The tissue changes are reversible for some hours (cf tourniquet) but later are fixed and no amount of transfusion will affect them If the surgeon is to have any chance at all he must operate early in these cases Hæmorrhage *is* a surgical emergency To wait for evidence that the hæmorrhage is unlikely to stop is to court disaster, as by the time this is known the effects which could be prevented by the operation have already occurred Moreover it is quite impossible in the urgent cases to know beforehand whether the lesion is accessible to surgery or not It is quite true that in some cases excision or partial gastrectomy may be technically impossible, but in most cases something can be done to stop the hæmorrhage and surely it is better to try My experience is that these patients stand operation well if they are operated upon within a few hours and adequate transfusion is given immediately before and during the operation

In view of the above it is not surprising if the physician finds himself in a terrible dilemma if hæmorrhage continues after he has delayed intervention in the hope of its ceasing Cases where surgery is delayed until the bleeding has stopped and the patient has had time to recover from the consequent anæmia do not concern us, they are not cases of profuse hæmorrhage from eroded arteries

Liverpool 1 H C W NUTTALL.

SIR,—The article by Bennett, Dow and Wright and the leading article in your issue of May 9 raise again the controversial problem of the treatment of hæmatemesis and melæna, and I write because I feel that neither article does full justice to the method originally suggested by Prof E Meulengracht of Copenhagen and since increasingly adopted in this country Meulengracht's essential contribution was the demonstration that the mortality from gastric and duodenal hæmorrhage could be reduced to a very low level by feeding the patient from the outset and by adequate transfusion Thus of the 251 patients reported in your journal (*Lancet*, 1935, ii 1220) he lost only two from hæmorrhage and one from perforation, as compared with a mortality of 7 9% in 289 patients in a similar series treated simultaneously by the old method of starvation and low diet in a neighbouring hospital His diet was subsequently modified for the English stomach by Witts (*Brit med J* 1937, i, 847) who confirmed its satisfactory results

I fancy that there is now little disagreement about the supreme value of early adequate and if necessary repeated transfusion in hæmorrhage from the stomach and duodenum as from other sites But it is disquieting to see that there is still doubt about the other measures to be employed, for your leader presses the claims of surgery, and Bennett and his collaborators treat their cases by small feeds of milk, preceded in the severe cases by a period of 6 to 7 hours in which only water is given by mouth Thus your leader states "Partial gastrectomy is a formidable undertaking in the presence of bleeding but these results seem to warrant such major procedures" I have consulted the papers referred to in your leader and find nothing in the published results of the surgical treatment of gastric and duodenal hæmorrhage to suggest that they are superior to those achieved by the Meulengracht regime Bennett and his collaborators do not adopt this regime because they "do not understand why the foods he recommends are selected" and because they "feel it would be far better to secure his ends by safer means" Their regime is adopted because it is held to be in conformity with the principle of "rest for the affected organ" But it is surely erroneous to believe that the stomach of the hungry man is at rest A J Carlson demonstrated the hunger contractions in the human stomach many years ago and it is easy to demonstrate the continued secretion of acid gastric juice in the empty stomach of a patient with peptic ulcer There can only be one criterion as to what are the safe means of treating bleeding peptic ulcer—namely, their effect on the probability of the patient's recovery—and the benefits of feeding as against starvation or semi-starvation have been demonstrated beyond doubt

Up till 1936 I treated most of my patients with gastric and duodenal hæmorrhage by starvation followed by small feeds of milk, a few were recommended for surgery. The results were as gloomy as those reported at the memorable meeting of the Royal Society of Medicine on March 7, 1934 Since 1936 I have treated *all* my patients on Witts's modification of the Meulengracht regime, and of more than forty patients treated I have lost only one I can echo Witts's statement "I do claim that they look, feel, and do better than any previous series of gastroduodenal hæmorrhage I have seen," and I agree entirely with his conclusion that "the results of immediate feeding, supplemented when necessary by transfusion, are much superior to starvation or operation"

St Mary's Hospital, Paddington. G W PICKERING

TRAUMA AND CANCER

SIR,—Mr Currey's letter of April 25 reminds me of another case of sarcoma of bone due to injury. Some years ago at Woolwich a young soldier was sent to me who had been badly bruised several weeks before over the inner side of the lower end of his right thigh by the pole of a wagon when he was trying to control a pair of restive horses There was a large tumour at the site of the bruise which he said was increasing rapidly It proved to be a sarcoma, for which subtrochanteric amputation was performed Recovery was uneventful Follow up was not made as I left for India shortly afterwards

Beaulieu. MAURICE HOLT

GASTRIC DISORDERS IN THE ARMY

SIR,—I should like to emphasise the third reason which Lieut -Colonel Smellie gives in his article of March 14 for the appreciable drop in the incidence of gastric disease in the Army—that "the Army cooking which two years ago left much to be desired has now improved so much that it compares favourably with that in civilian life" I have had the opportunity of watching many thousand men in the Army during their meals, and I was particularly struck by the preparation of food in a large RAMC depot, which compares favourably, in my opinion, with the highest class of civilian cooking I was glad to see that fat was used in a rational and economical way, and that none was served to the men as such. It has been my experience that with very few exceptions the men avoid eating fat. In small establishments, where the men sometimes used to complain of not getting enough to eat, when questioned they replied that they left *nothing* on their plates, but when further pressed they made it clear that they left only the fat, as they did not consider it a food. In an R.A.M.C. officers' mess, where officers placed their used plates on the sideboard, it was rare to find a plate on which no fat was left. Much less fat is now provided for the troops, thus further restricting its consumption. I think it cannot be denied that "proper cooking" should include judicious use of fat as an instrument in the preparation of food.

J. JACQUES SPIRA

SULPHONAMIDE THERAPY OF IMPETIGO

SIR,—From the paper by Schlesinger and Martin (May 2, p. 527) it appears that the treatment of impetigo with sulphonamides by mouth is successful, but the small series of patients treated locally with sulphapyridine and sulphanilamide responded as well as those treated with corresponding preparations by mouth. The fact that sulphathiazole and sulphadiazine are more efficacious is doubtless explained by their greater antistaphylococcal action. The average length of cure required for the treatment of true impetigo with sulphathiazole ointment is 4–5 days (*Brit. med. J.* Jan. 3, 1942, p. 12). This finding agrees exactly with that of Winer and Strakosch (*J. Amer. med. Ass.* 1942, 118, 221), who treated 60 cases of impetigo with 5% sulphathiazole ointment and obtained cures in an average of just over 4 days. They also treated 20 patients with sulphathiazole by mouth and no local treatment, and obtained cures in an average of 9½ days! During the past six months I have found that 5% sulphadiazine ointment gives results comparable to those seen with sulphathiazole. With both of these compounds the results are superior to those which I have seen with sulphanilamide and sulphapyridine ointments.

Apart from the consideration of duration of treatment, other factors favour the local use of chemotherapeutic agents, where possible. From the standpoint of economy, the 24 g. of a sulphonamide employed to treat a case of impetigo by mouth will make up 16 oz. of a 5% ointment, an amount ample to treat many cases locally. In addition, of course, one obviates the depression, unpleasantness and risks of systemic sulphonamide therapy. The degree of skill and diligence ordinarily required for the proper application of local preparations can generally be met.

Salisbury. ALEX J. STEIGMAN

MISFORTUNE NOT FOLLOWED BY DEPRESSION

SIR,—I am writing a book on depression, with special reference to war experiences. I have sufficient case material of misfortune followed by depression, but I should be grateful for details of war experiences of a disastrous or heroic nature which have *not* been followed by depression. These cases would be useful as "controls" and I should be glad to receive good and well-authenticated stories to which I might be allowed to refer for their illustrative value.

Harley Street, W.1. E. GRAHAM HOWE

TEMPERATURE TAKING

SIR,—I desire to call your attention to the method of temperature taking in two large hospitals, of both of which I have had recent experience.

The first hospital sends round a nurse with thermometers in a small jar of disinfectant. She takes one out, places it in the patient's mouth, and puts it straight back into the jar without any attempt at cleansing. The result is that each patient gets a thermometer in his mouth which has been standing in a solution gradually more and more contaminated with the saliva of previous patients—a nasty, dirty, insanitary procedure.

In the other hospital the method is as follows. The nurse has a small tray on which is a jar of disinfectant for the thermometers, a dish with small pieces of dry cotton-wool, a dish with small swabs of wool moistened with disinfectant, and a small empty dish. The thermometer is wiped with one of the dry wisps before putting in the patient's mouth, and washed with a wet swab after taking the temperature and before returning to t jar. The used swabs and wisps of wool are put in the empty dish—a simple, clean, sanitary method.

I have written this letter in the hope that, should it reach the eye of any responsible officer in a hospital which carries out the former practice, this officer may be induced to adopt the latter.

Hove, 2. L. A. PARRY

DOUBTS ON VITAMIN K FOR THE NEWBORN

SIR,—I would like to support Macpherson and Henderson's letter in regard to the misleading nature of your annotation of April 18. It would be a great pity if doubt on the value of vitamin K was allowed to pass unchallenged and so cause confusion. Hypoprothrombinæmia causing hæmorrhage in the newborn can be prevented and treated by the use of vitamin K. Other hæmorrhagic conditions arising at the same period must be diagnosed and treated accordingly. If this is done no confusion need arise. For the last two years we have used vitamin K in the Rotunda Hospital with most satisfactory results so that now it is practically never necessary to give whole-blood injections. Indeed we can say that the introduction of vitamin K may be regarded as one of the most valuable therapeutic measures in the armamentarium of the pædiatrician dealing with the neonatal period.

Rotunda Hospital, Dublin. W. R. F. COLLIS

LESS SMOKE NOW

SIR,—The change of title from "Smoke Abatement," suggested in your annotation of May 2 (p. 537), is long overdue and not only for the reason that prevention, not abatement, should be our aim. The word "smoke" is itself scarcely adequate, even considering the wider definition given in the Public Health Act 1936 as compared with previous legislation. No mention is made of the noxious fumes which may be inseparable from certain trade processes, but just as inevitably may foul our atmosphere. May I point out that the Smoke Abatement Society received a lead in this direction as long ago as 1938, when the Midlands Regional Committee changed their name to Midlands Joint Advisory Council for the Abatement of Smoke and Atmospheric Pollution—unwieldy, perhaps, but giving a more exact idea of the objects of the council, and one which led to a much wider use by local authorities of the expert advice available to them through the council.

Home Forces. W. R. MARTINE

CTAB

SIR,—When certain improvements are made 'Ctab' should be a useful addition to our armamenta of disinfectants for, unlike the lysol and chloroxylenol types of preparations which contain soap, ctab should be stable and active in acid media, which they are not.

In his article of May 2 (p. 531) Dr. Barnes suggests that ctab could be used as a general hospital disinfectant for the disinfection of utensils, &c. In this connexion, however, there is one property of ctab which is not brought out in the report—namely, that it is incompatible with ordinary soap solutions. The latter, being anionic detergents are antagonistic to cationic ones, and ctab will tend to be precipitated and inactivated if it comes into contact with soap. If a soap solution be gradually added to ctab solution the frothing power of the latter will diminish to zero and then increase, but the froth then will be due to the anionic detergent, soap. It is by no means uncommon in ordinary hospital practice to have to disinfect soapy residues. Therefore the suggestion that ctab could be used as a general hospital disinfectant must be modified with the warning that it must not be brought into contact with soap. It will also be incompatible with some of the newer anionic detergents such as 'Dreft' (potassium lauryl sulphate), which were coming into hospital use as hard water detergents, and replacing soap, before the war restricted supplies. In hospital disinfection practice, too, it is not unusual to have to cope with the presence of protein matter which lowers the value of chloroxylenol preparations and of lysol to a less extent. 'Zephiran,' another cationic detergent with bacteriological properties closely similar to those of ctab, is affected by protein and it is reasonable to expect that ctab will be similarly affected.

H. BERRY

College of the Pharmaceutical Society.

NICOTINIC ACID IN ANGINA PECTORIS

SIR,—The letter from Lisbon in your last issue prompts me to record another possible use for nicotinic acid in respect of its vasodilating properties This is for patients with angina pectoris I have used it now on three patients, in doses varying from 10 to 50 mg daily by mouth, and the results as regards the number of attacks of pain have been gratifying although irregular I have mentioned the matter to colleagues who have greater opportunity than I have to test the drug further for this malady, but meanwhile your readers may like to know of this means of alleviating a distressing complaint Nicotinic acid does not appear to be as effective as the nitrites for relieving an attack of anginal pain nor in preventing its development if taken at a threat of pain Its value seems to be between attacks, to reduce their frequency This is all rather outside my usual therapeutic scope but emergency conditions have given me once again the care of adult patients

An EMS Hospital　ALAN MONCRIEFF

SUBSTITUTE FOR GLYCERIN EAR-DROPS

SIR,—Having in peace-time made use of various glycerinated ear-drops in the treatment of otitis media with purulent discharge, and being now unable to procure glycerin I have in recent months used 'Soluseptasine Throat Spray' (M&B) with great satisfaction Also in a long-standing case of otitis externa with much swelling of the meatus and external auditory canal causing deafness, which had resisted the usual remedies, soluseptasine rapidly cleared up the condition In this case I found it advisable to smear the external meatus lightly with zinc oxide ointment between applications of the soluseptasine to the canal At this time of glycerin shortage I think soluseptasine is well worth a trial in such conditions

Sutton Bonington, Notts　J C P BEATTY

DOSAGE OF INSULIN

SIR,—I do not wish to express an opinion on whether it would be better to standardise insulin in only one strength or to retain the present arrangement by which the three principal types of insulin can be obtained in different concentrations, but to prevent further confusion I would point out that Mr Luntz in correcting Dr Barnard's error of omission has himself made one of commission, for zinc protamine insulin is not, and never has been, available in "single" strength in this country

The preparations of insulin obtainable in this country are as follows :—

Soluble Insulin (regular or clear)	20 units per c cm	"Single strength"
	40 ,, ,, ,,	"Double-strength"
	80 ,, ,, ,,	"Quadruple-strength"
Zinc Protamine Insulin	40 ,, ,, ,,	"Double strength
	80 ,, ,, ,,	"Quadruple strength"
Delay Insulin (Protamine or Retard)	40 ,, ,, ,,	"Double strength"
	80 ,, ,, ,,	"Quadruple strength"

Diabetic Department,
King s College Hospital　WILFRID OAKLEY

STACCATO SENTENCES

SIR,—Your reviewer (May 9, p 562) deplores the form of Dr Gurdham's sentences Brevity of statement in medical literature is increasingly rare and desirable Verbosity cannot give weight to unsound argument, tho' it may make false logic more difficult to detect I would suggest that pompous compromise, the slovenly cliche and unnecessary hendiadys and the obscurantism of a misplaced zeal for the *mot juste* are frequent features of modern medical literature They disguise error and hide truth. They encourage a mentality inimical alike to science and the humanities They should be discouraged "Short staccato sentences" are a move in the right direction

C W M WHITTY

METHYL TESTOSTERONE BY MOUTH —Messrs Ciba Ltd remind us that their 'Perandren Linguets,' each containing 5 mg of methyl testosterone are available for oral administration They are intended to be dissolved under the tongue, to avoid any destruction of the hormone by intestinal ferments or the liver

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS M P

THE debate on industry in Scotland which took place this week was a debate the general principles of which might apply to any small nation In 1911 Scotland had a population of 4 760,904, and the distribution by 5-year age-groups shows that those up to and including 24 are all larger than those in 1938 and that those from 25 years upwards are all smaller than those in 1938 The population in 1938 is estimated at 4,993,100, but the increase is confined to the higher age-groups The return of industries to Scotland, which was the object of the debate, may redress this balance But the big-scale changes in medical administration which Mr Thomas Johnston has in view may also make a helpful contribution More will be heard of Mr Johnston s proposals before long

* * *

The other big debate this week was on the Finance Bill Its results can be stated shortly—tightening up But at question time and in the committee rooms and lobbies of the House pensions and allowances have been much discussed The old-age pensioners' position is thought by many members to be due for improvement in view of the inescapable increases in costs of living and of beer and tobacco which the budget imposes

The pressure of circumstance compels re-examination of financial standards and normal methods of financial provision And it is because of this pressure that the problem of family allowances is coming into its own For years the trade union movement was opposed to these allowances as they feared that they would be used to reduce wages rates The political labour party was always sympathetic and latterly very sympathetic and gave general support But now the general council of the Trade Union Congress has accepted the principle of child endowment and it is expected that at the Whitsuntide conference of the Labour party a definite approval will be given Lord Southwood is to bring the matter up in the House of Lords after Whitsun It is also stated that the Coöperative movement will bring the matter up at their conference in Edinburgh In the House the Liberal party will give support and the indefatigable Miss Rathbone, to whose persistent advocacy so much of this progress is due, is likely to get the success for which she has worked for so long Many Conservatives are favourable, and the principle of meeting difficulties of inequalities of pay by allowances for children will be strongly supported on that side of the House Probabilities are therefore that a measure will be brought before the House and a principle long fought for may this year become an accepted part of our financial machinery

With all these complex methods of social provision multiplying it is understood that Sir William Beveridge is working on a comprehensive plan to group social services together We are making big changes in our present and in our future world under the pressure of the realities of war

FROM THE PRESS GALLERY

Wood Alcohol

On May 13 in the House of Lords, Lord TEVIOT asked the Government what steps were being taken to trace and punish those manufacturing and selling wood alcohol under the guise of whisky The Duke of DEVONSHIRE, answering for the Government, said he was informed that neither wood alcohol nor its modern synthetic equivalent, methanol was being made for drinking The matter however was being carefully watched by the Board of Customs and Excise as well as by the police Such reports as had reached them about the drinking of wood alcohol or methanol suggested that the small quantities known to have been consumed were legitimately manufactured for commercial or chemical purposes and were obtained by theft Lord TEVIOT pointed out that friends of his in an eminent hotel in London had just escaped death after very abstemious drinking He urged that the makers of this dangerous stuff should be sought out and punished with the utmost rigour of the law The Duke of DEVONSHIRE said that his information was that there had recently been two deaths due to the consumption of methyl alcohol or methanol Two seamen in London bought some wine from a dock-worker which had been fortified with methanol stolen from the docks The seamen died and the dock-worker was now in prison About a dozen people had also died from drinking spirits stolen by Glasgow dockers He had not heard of the matters referred to by Lord Teviot, but if he would supply the necessary details they would be looked into

Allowances for Invalid Children

In the discussion on the Finance Bill on May 14, Mr J H Wootton-Davies proposed an amendment that "for the purpose of relief of assessment to income-tax in respect of children, any child who, because of mental or physical disability, is incapable of employment shall be deemed to be a child of less than fourteen years of age" Captain H F Crookshank said that at present for these children a parent gets £25 as a dependent relative's allowance and there is of course no age restriction for this concession. These appeals were difficult to resist, but he did not think it was reasonable to suggest a man should get a relief of £50 for supporting an infirm child and only £25 for supporting his infirm father, but Mr W A Burke pointed out that for a relative the dependency does not usually extend over the same number of years as for a child Mr H Brooke hoped that before the next budget, in view of the present high rates of income-tax, the whole allowance system could be reviewed, and Mr Wootton-Davies accordingly withdrew his motion

QUESTION TIME

Midwives Salaries Committees

The Minister of Health in answer to a question announced that the terms of reference of this committee were "to draw up agreed scales of salaries and emoluments of state certified midwives employed in England and Wales on maternity work in hospitals or maternity homes or in the domiciliary midwifery service, of non medical supervisors of midwives, and of pupil midwives" The committee will consult with the Nurses' Salaries Committee before making recommendations in regard to overlapping matters The following is a list of the midwives committee —

Lord Rushcliffe (chairman), Mr J Evans, Miss K J Stephenson, and Dr W A Bullough (County Councils' Association) Dr W Allen Daley (LCC), Lady Richmond, Mrs Hurle and Mrs Kevill Davies (Queen's Institute of District Nursing), Mr Councillor Brosch, Sir George Martin, and Mr J Lythgoe (Association of Municipal Corporations), Mr C S Wentworth Stanley and Mr G G Panter (British Hospitals Association), Dr F Grundy Mr Arnold Walker, F R C S, Miss Coni, Miss Deane, Mrs Ross, and Mrs F R Mitchell (College of Midwives), Mr C A W Roberts (National Association of Local Government Officers), Miss M E Platt (Association of Supervisors of Midwives), Miss J Murphy (Trades Union Congress) Miss L Beulah, Miss M G Sanday, and Miss M F Webb (Royal College of Nursing)

Employment of Ex-Midwives

Under regulation 33 of the Defence Regulations, 1939, a local supervising authority may enable a qualified midwife no longer on the Roll of Midwives to practise for a specified time My information is that 32 orders are at present in force affecting 136 midwives (Miss F Horsburgh replying to Mr W Brown)

Supplies of Quinine

Replying to Mr J de Rothschild, who asked what steps were being taken to develop the production of quinine in the West Indies in order to compensate for the absence of supplies from the Dutch dependencies, Mr Harold Macmillan, under secretary of state for the colonies, said Steps are being taken to increase the production of quinine in the colonies, for technical reasons these do not at present include development in the West Indies —Mr de Rothschild Is the under secretary not aware that extensive cultivation of cinchona existed in Trinidad for a great many years? Is he aware that if this cultivation could be revived it would be a very useful source of supply?—Mr Macmillan I should like to look further into that

Rope in Bread

Major G Lloyd George informed Mr J W Banfield that instructions had been prepared by an expert committee set up by the Ministry of Food on how to prevent rope in bread These instructions would shortly be sent to all licensed bread bakers He hoped that by particular attention to cleanliness in bakehouses and by following the instructions *given to them bakers would themselves be able to prevent* outbreaks A reserve of suitable chemical correctives was, however, being established for distribution to bakers should need arise —Dr Haden Guest Can the Minister tell the *House what rope is?*

Major Lloyd George It is something not exactly pleasant which is sometimes found in bread, but I hope it will not be found there in future

Pension Appeal Tribunals

Replying to Mr Vernon Bartlett who asked how many doctors would be required for the establishment of an adequate number of pension appeal tribunals, Sir Walter Womersley said Including the additional appointments which would have to be made to my own staff, I estimate that 35–50 whole time doctors would be required —Mr Bartlett Would it not be quite easy to obtain doctors and cannot the Minister set up these tribunals as soon as possible?—Sir W Womersley I have made every endeavour to secure doctors, but at the moment it is not possible to obtain them —Mr Bartlett Can anything be done with the doctors already serving in the Army, who fortunately have not had much to do?—Sir W Womersley That avenue and every other has been explored

Allowances of Disabled Ex-Servicemen

Arrangements have been made with the Service departments that any man who has suffered an amputation in service shall be retained in the service and continue to receive service pay and allowances until at least 28 days after he had been satisfactorily fitted with an artificial limb (Sir W Womersley replying to Mr T H Hewlett)

Ex-Service Men and Gastric Disorders

Sir Smedley Crooke asked the Minister if he would consider the advisability of establishing a special clinic for the treatment of disabled ex service men suffering from gastric disorders —Sir W Womersley replied I consider that the medical needs of these cases are adequately met by existing arrangements, but a suggestion has been made that this matter should be discussed between medical experts and I have offered to arrange this

Dental Scheme at Cambridge

Mr K M Lindsay asked the Minister of Health whether he was aware of the pioneer dental scheme organised in Cambridge for young workers who had left school but who were ineligible for benefit from approved societies, and whether he would encourage all local authorities to take similar action —Mr Brown replied I have no recent report upon the scheme but I will make inquiries —Mr Lindsay Will the Minister consider taking some joint action with the President of the Board of Education with a view to seeing that the work done in the schools is not thrown away during the years of adolescence?—Mr Brown I am always glad to work closely with the President of the Board of Education

School Medical Service

Mr Lindsay asked the President of the Board of Education whether he was aware of a shortage of doctors in the school medical service, and what steps he was taking to remedy this deficiency —Mr R A Butler replied All branches of medical practice have suffered owing to the needs of the fighting services, and the school medical service has necessarily had to bear its share I have impressed upon local education authorities the importance of making the best possible use of available medical manpower

School Meals

In answer to a question Mr Butler said that local education authorities were under a statutory obligation to satisfy themselves whether parents were able to pay for school meals provided for their children In July 1940 the Board asked all authorities, whose scales had not been recently revised, to review the position, and the income scales of most authorities had been revised in consultation with the Board in the light of the increased cost of living It was the Board's practice to take exception to any scale which did not provide for free meals where the net income for a family of five was less than 8*s* or 9*s* per head, with suitable gradations for larger and smaller families and in many instances considerably higher scales had been adopted He was aware, however, that in some areas the scales were less generous and he proposed to circulate to local education authorities this reply with a request that the scales should be reviewed

Nursery Centres

The number of part time nurseries, formerly called nursery ntres, are 141 in operation, 55 approved, but not yet rking; 22 in an earlier stage of preparation For wholene nurseries the figures are 312 in operation, 484 apoved, but not yet working, 254 in an earlier stage of eparation. (Mr BROWN replying to Sir RALPH GLYN)

Tuberculosis in Mental Hospitals

Mr J PARKER asked the Minister what action he proposed take to control the increase in tuberculosis occurring in ental hospitals in which, from figures supplied by his deartment, the mortality from tuberculosis in 1941 was twice e pre war figure, whether this subject was within the terms reference of the investigation by the Medical Research ouncil into tuberculosis, and whether a Report of this vestigation might be expected in the near future —Mr OWN replied · The Board of Control are taking all practicble action to minimise war-time risks, within the limits of the ccommodation at their disposal The problem is being ealt with partly by bringing back into use verandahs for eeping which have not been available owing to air raid angers The increase of tuberculosis among mental patients s being examined by the committee of the Medical Research ouncil who expect to submit an interim report in the near uture

Help for Tuberculous Patients

Mr JAMES GRIFFITHS asked the Minister what are the owers vested in standing committees set up under the Public ealth Act, 1936, under Section 173(2), and whether those owers enabled the committees to grant financial assistance to he dependants of all tuberculous patients —Mr BROWN eplied Under this section the council of a county or county orough may make such arrangements as they think desirable or the after care of persons who have suffered from tuberculosis I have no power to interpret the provisions of the ection

Age-groups in Scotland

Mr JOHNSTON, replying to a question, made the following statement showing the numbers of people in Scotland in the various age groups

Age-group	Census 1911	Census 1921	Estimated population 1934	Estimated population 1938
Under 1	108,381	112,541	82,700	83,400
1–4	424,364	359,832	327 300	318,100
5–9	513,758	477,346	427,600	403,600
10–14	490,134	489,993	478 100	431,300
15–24	882,218	906,881	829,700	859,100
25–34	741,276	714,278	783,500	804,300
35–44	600,410	632,508	627,000	666,200
45–54	446,690	534,500	551 300	554,300
55–64	295,870	361 946	452,200	468,900
65–74	184,986	206,879	268,300	290,200
75–84	63,120	74,417	94,600	102,000
85 and over	9318	10,612	12,000	11 700
Not stated	379	764	—	—
All ages	4 760 904	4,882 497	4,934 300	4 993 100

Accidents in Coal Mines

Mr DAVID GRENFELL, replying to a question, gave the following figures for accidents in coal mines —

Year	Great Britain		South Wales and Monmouthshire	
	Killed	Injured *	Killed	Injured
1936	790	135 968	148	24 762
1937	859	140 645	182	27 345
1938	858	131 776	154	25 564
1939	783	134 072	162	25,222
1940	923	146 388	182	27,783
1941	925	n a	191	n a

* Disabled for more than 3 days n.a = not available

Scabies Investigation

Replying to a question Mr BROWN said Mr Kenneth Mellanby's investigation began at my instance but is now being continued under the auspices of the Medical Research Council Its object has been to obtain more knowledge of the parasite, the means by which scabies is spread, and the best methods of treatment For this the services of human volunteers were

Continued at foot of next column

NURSING RECRUITMENT IN MANCHESTER

FOR frank, undiluted, straight-hitting propaganda it would be difficult to find anything more deserving of success than the Nursing Exhibition staged in the Manchester central library between May 4 and 16 Of its total success no-one can form immediate judgment for it will bear fruit for many years to come, of its deserts and of its direct success there can be no question and of the many good exhibitions held in the library during the past seven years it certainly holds first rank It was the joint work of the city public health committee and of the nursing recruitment campaign committee appointed by the medical officer of health, Dr Veitch Clark and its object was to interest girls and young women in nursing as a career There is and has been for many years an acute shortage of nurses in the district, where there should be 400 recruits every year The present campaign is to remedy that shortage

The hundreds of exhibits were in four main classes historical, in which Florence Nightingale and Nurse Cavell play a big part and in which Sairey Gamp is not neglected, the student nurse in which the training is illustrated from start to finish, the hospital nurse at work, branches of work now open to state registered nurses A specially interesting subsection is that devoted to the awkward age the gap between the time when girls who cannot afford a long education leave school and the eighteenth birthday. when nursing training can begin It is this period which forces many girls who may have a bent for nursing to take up less congenial work The two main schemes to help over this difficulty are the pre-nursing course by which secondary schoolgirls who have reached school certificate standard may take the first part of the preliminary state examination while still continuing their general education in their old school, and the junior student nurse scheme by which girls who have not continued their general education to school certificate standard may carry on their education at a continuation school and serve in nursery classes and schools before entering hospital For these a special curriculum has been devised by the Manchester education committee with a scheme of maintenance allowance of from £20 to £40 a year Diagrams pictures and models, many of them the highly realistic work of artists, were used for illustration There were models of patients swathed in plaster, models of sanatoriums, of overseas hospitals of foods, of test meals being given, of cots for premature babies, and of industrial apparatus used to prevent injuries Each day demonstrations were given at intervals by the staffs of local hospitals

This pleasing exhibition was crowded with schoolgirls of the age when they are thinking what occupation in life they will take up Other towns interested in the nursing service may well stage similar shows The organisers of the demonstration and especially Miss J M Calder, the secretary, are to be congratulated

E B L

Continued from previous column

essential Forty seven volunteers have been infected They have remained under examination for varying periods up to 18 months The investigation is still in progress, but preliminary results are to be found in the White Paper Of the volunteers infected the majority, and all of those infected for more than one week, are conscientious objectors none of them has been directed to this duty by a tribunal, though some who were already engaged in it when they went before a tribunal were exempted from military service on condition that they continued in the work or took up first aid duties They have suffered discomfort rather than danger, but I am advised that they have not been free from risk of incurring some prolonged disability

Public Health in Trinidad

Mr H. MACMILLAN, replying to a question, said he was aware of the unsatisfactory health and sanitary conditions in factories in Trinidad and the inadequate precautions taken to prevent accidents An inspector of factories was appointed several months ago, but it has unfortunately not yet been possible to arrange for him to leave this country owing to difficulties in arranging a passage The urgent importance of securing a passage for him is being strongly pressed, and it is hoped that he will sail very shortly

Obituary

HENRY RUSSELL ANDREWS

M D LOND , F R C P , M M S A , F R C O G

All who attended the obstetric department of the London Hospital a generation ago will hear with regret of the death on May 7 of " Dicky " Andrews For many years he did an enormous amount of work in a very busy department and remained its chief driving force His students will perhaps best remember him for his Thursday afternoon clinic (" The *Matinee* ") Here he saw patients before a crowded class and many searching questions were put to those attending, and always the same punctilious politeness no matter what the answer Here too was full scope for another characteristic, that of always remembering the names of everyone If at a loss for a moment the inevitable " No, don't tell me " would soon be followed by the correct name Occasionally a little whimsical touch like the mixing of the names of Mr Toop and Stern would help to keep the *function at the top of its form His forceful* teaching was never sarcastic and much of his teaching is remembered by his students all their life He had the happy knack of getting the best out of his assistants , always helpful, he expected a high standard of work from them, and was most long suffering of ignorance but not of slackness It was in fact hardly possible to be other than vigorous when such a tower of strength was at hand He was a lover of sport and would frequently start the day hunting before returning to a hard day's work at hospital, and in September many a good fish came to the residents' mess from the far north The extra work which he did during the last war told on his health, but when he retired in 1926 he was still in his prime Always at his best at public functions enjoying the good things of life, at the farewell dinner given by his *residents some of us detected that little sadness in him,* perhaps reflected from our own feelings at the prospect of losing our leader Long will he be remembered by a multitude of students and patients as a great obstetrician and a splendid friend V L

Henry Russell Andrews was born in 1871, the son of the Rev J M Andrews, a former vicar of Highgate He was educated at Merchant Taylors', and took his medical degree from the London Hospital in 1894 Postgraduate study in Berlin and Vienna preceded return to his old hospital where work in junior posts earned election to the honorary staff A junior colleague has told of the affection and respect he won there as a teacher , many other students will remember him as examiner for the Universities of Oxford, Cambridge, London and Durham, for the Conjoint Board, and for the *Society of Apothecaries He was elected to the fellow*ship of the Royal College of Physicians in 1913, the Society of Apothecaries admitted him to the mastery of midwifery in 1925, and the Royal College of Obstetricians and Gynæcologists, which he served for a term as vice-president, made him a fellow in 1929

He married in 1914 Margaret Dorothea, daughter of Walter Reynolds of St Albans

HAROLD BARR GRIMSDALE

M B CAMB , F R C S

Mr Harold Grimsdale, ophthalmic surgeon and writer, died at Hindhead on May 5 in his 76th year He was the son of Dr T F Grimsdale, consulting physician to the Liverpool Lying-in Hospital and sometime vice-president of the Obstetrical Society of London Well endowed in body and mind he gained entrance scholarships at Winchester, Caius College, Cambridge, and finally at St George's Hospital, while he was a good oarsman and useful at rugby Qualifying from St George's in 1892 he held house appointments there and after working for Brudenell Carter he turned to ophthalmic surgery as a career After being clinical assistant at Moorfields and taking the he was elected to the staff of Westminster and then of St George's E W B , who was for years associated with him at the former, calls him a operator and a sound diagnostician Grimsdale's knowledge of foreign work was profound and he translated foreign articles for the *British Journal of Ophthalmology* He wrote easily and with enjoyment, and collaborated in a Textbook of Ophthalmic Operations ran through three editions over a period of 30 years This book was a good and practical guide to the surgeon and had the merit of giving references at the end of each chapter to the original description of the operations In all his public work, and he had many appointments outside the two hospitals, Grimsdale was popular with his colleagues and beloved by his patients From the Westminster he retired before reaching the age limit of 60 but served his full term at St George's His private work went on until his home in Cambridge Gate was wrecked last year In later life he took much interest in music and the stage He married Mabel, daughter of S E Todd of Beverley, who survives him

ROBERT TROUP

M B EDIN , SURGEON-LIEUTENANT R N V R

Beares Studio

The death on active service has been presumed of Dr Robert Troup who was aboard H M S *Calter* when she was torpedoed on Jan 30, with only six of the crew rescued Dr Troup qualified at Edinburgh University in 1937 and held house-appointments at the North Devon infirmary, Barnstaple, and then at Bradford and Perth For six months he was an assistant in general practice in Perth He was studying for the fellowship of the Royal College of Surgeons at Edinburgh when he joined the RNVR in April of last year He came of a Bo'ness family and last September married Miss Agnes Sinclair

WILLIAM JOHN CARLYON ANSTIE

B M OXFD , FLIGHT-LIEUTENANT R A F V R

Flight-Lieutenant John Anstie, whose death on active service in Ceylon at the age of 31 is announced was the son of the late W H Anstie He was educated at Cheltenham College and at the age of 18 went to Wadham College, Oxford, where he graduated B A with second-class honours in 1932 He went on to St Thomas's Hospital where he obtained his medical degrees in 1935, and after qualifying he held house-appointments there A friend and colleague writes of him

Marjory Lacey London

John Anstie was fortunate in possessing an untiring energy which enabled him to pursue many and varied interests If he did not shine brilliantly at any one of them, he was surprisingly well-informed on a wide diversity of subjects As a conversationalist, he was always refreshing, for he would listen with genuine interest to what the other person had to say He loved all forms of art and was never happier than when he was sitting at his piano or with his friends at a concert or play His devotion to his mother, his sister and brother contributed not a little towards an exceptionally happy family life

---

Charles Ludwig, who was killed while engaged on operational duties with the RAF, graduated in honours at Aberdeen in 1934 and was a demonstrator in physiology t Leeds from 1938–40 when he resigned to join the AF As a physiologist he would have had a distinuished career if he had survived the war and overcome he modesty which kept him from making full use of his owers He was also a charming companion and a rilliant mountaineer, always eager to face danger and ardship For one of his temperament the need to join he fighting services must have become imperative he sequel is a loss to teaching and research in physioogy, but for a time the RAF gained an officer highly ndowed with scientific ability, courage and friendliness

Public Health

From the Annual Reports

BIRTH AND DEATH

OF 1838 notifications of birth in *St Marylebone* in 940, 1735 were received from hospitals and nursingomes, 984 from Queen Charlotte's Hospital 530 irths were registered, of which 449 belong to the borough his number is 307 less than in 1939, giving a birth-rate f 8 52 on the estimated population of 62,240 In 1939 the rate was 9 06 on the estimated population of 97,620 Of the 449 births accredited to the borough 81 were llegitimate The stillbirth-rate was 27, the infantile mortality 67 07, and the general death-rate 18 07 In *Shoreditch*, with an estimated population of 57,090, there were 916 births, giving a birth-rate of 16 The stillbirth-rate was 24 49, the infantile mortality 69, and the general death-rate 23 09 Both boroughs suffered from enemy action and from evacuation For comparison, *Barnsley*, which was little affected by enemy action or migration, with an estimated population 71,522, had a birth-rate of 16 83 and a crude death-rate of 13 68 The stillbirth-rate was 37 28 and infantile mortality 60

The high death-rates ruling at present are misleading as a measure of the health of the population for men (but not women) serving in the Forces are excluded from the civil population on which the rate is based Normally these males would have a low death-rate, but war is not conducive to longevity, though up to the present the wastage by death of warriors has not been high As a measure of population trend the rates are important The future of a population does not depend on the birthrate and the death-rate but on the actual numbers of persons who come in and go out Here there is cause for anxiety In 1920, the number of persons born in England and Wales reached the record of 957,782 In 1933 the number fell to the low record for 80 years of 580,413 There has been a trivial improvement since, but the newcomers since the last war are less than threequarters of those between the South African war and the war of 1914–18 From 1920 to 1939 the death-rate was fairly level, except in 1929 when it was 13 7, but it is now rising briskly Unless there is a substantial rise in births the outlook is that within the next half century the population will fall to about two-thirds of what it is at present A more immediate danger is that if the war is very long continued we may fail from lack of recruits Of the 1920 human harvest there may be about 350,000 surviving males, of the 1933 harvest there will not be more than 250,000.

GROWING OLD

The ageing of the population which has been accelerating for 60 years, the subtraction from the civil population of males serving in the Forces and the great reduction in the deaths of the young and healthy from infectious diseases have materially altered the death tables of the past three years The average age at death has risen greatly Increased deaths from violence, which mainly occur in the young and healthy, have however somewhat checked this rise Some causes of death have become almost negligible while others have grown to enormous proportions The number of deaths from cancer increase and many medical officers in their 1940 reports give special comments on this disease The crude death-rate per 1,000,000 population for males rose from 691 in 1901 to 1632 in 1938, for females from 985 to 1676 On standardisation for age the rate for males increased from 727 to 1066 and for females from 944 to 961 In both sexes there has been a fall in deaths from cancer in all sites except the abdomen and chest, but here the rise has been great Part of it, especially in the lung, can be attributed to improved diagnosis; but there has been little improvement in abdominal diagnosis in the past ten years, so the rise in cancer of the digestive organs must be nearly wholly genuine. There has been some progress in prevention, but only of cancer in certain sites, none of which are common sites of the disease There has also been improvement in treatment, but here also, with the exception of breast and uterus, only in sites which are of minor importance The main thing which has happened in the present century appears to be not that cancer has increased in its virulence but that our abdominal organs have become more susceptible to the disease Coincident with this there has been a steady increase in other abdominal diseases such as peptic ulcer and appendicitis It is natural to suspect dietetic habits to be responsible for this, but up to the present we have not been able to connect these abdominal diseases with dietetics It will, however, be interesting to learn whether rationing has any influence on the march of the major abdominal diseases, though if it has the effect must not be expected for several years

EXPEDIENTS

The only sophistication of foodstuffs of any great public health importance today is tampering with milk, which does not diminish Watering spirits, which is of no importance from the health point of view, is much rarer in spite of the fact that spirits cost about £5 a gallon whereas milk costs about half a crown The explanation is simple Money is still considered more important than life, so the penalties for swindling H M Excise are heavier than those for starving babies Most other sophistications are more amusing for their ingenuity than of consequence for their public-health danger

Migration, which has thinned out our most densely populated cities and boroughs, has led to overcrowding of the smaller towns and villages, but up to the end of 1940 this has produced none of the effects which some hygienists expected from it

Dosage of APT

EXPERIENCE has shown that an increased dosage of alum precipitated toxoid in diphtheria immunisation is desirable Since the Ministry of Health undertook to provide free diphtheria prophylactic to metropolitan borough councils and provincial local authorities, in 1940, there has been a good response, especially in country districts, to the immunisation campaign In a letter to the medical officers of health, dated May 8, Sir Wilson Jameson, the chief medical officer of the Ministry, suggests that the doses of 0 1, and 0 3 c cm hitherto used should be raised to 0 2 and 0 5 c cm The increase in the first dose is recommended merely on practical grounds Owing to an imperfectly calibrated syringe or to escape of inoculum through the needle track there is a chance that a significant amount of a small dose may go astray The inoculum too may vary, either because the person giving the injections forgets to shake the bottle well or because several children are inoculated in succession so slowly that some sedimentation of the alum toxoid occurs in the syringe If a dose of 0 2 c cm is prescribed there is a better chance that every child will get at least 0 1 c cm The increase in the second dose from 0 3 to 0 5 c cm is of less importance, but will help to widen the margin of safety. APT may deteriorate because there has been failure to keep it in a refrigerator or for other reasons, and the larger dose will guard against inadequate antigenic stimulus With these increased doses more children may be expected to show reactions, and he advises that any child who has a severe reaction after the first dose should be given only 0 3 c cm as the second dose

The importance of immunising children under the age of 5 is again strongly emphasised Immunisation of children between 5 and 15 will not materially reduce the incidence of diphtheria in a community unless a majority of the children under 5 are also immune Children who are given protective treatment in these early years should receive a supplementary dose of 0 5 c cm of APT on beginning school life

In a second letter of the same date Sir Wilson Jameson points out that many young women are beginning nursing at an earlier age than they have done in the past, and that it has been found that a high proportion of nurses in general hospitals are Schick-positive He suggests that medical officers of health may wish to extend the offer of immunisation to susceptible nurses, especially those working among children in hospitals or nurseries Toxoid antitoxoid floccules (TAF) is recommended for this purpose because it causes less reaction than APT Free supplies are available, and three doses of 1 c cm each are suggested, to be given at intervals of 3 weeks Those who show a reaction to the control toxin in the Schick test should be given an initial dose of not more than 0 5 c cm , and if this causes a severe reaction subsequent doses should be 0 5 c cm or less A Schick-negative reaction does not exclude the possibility of diphtheria in a person exposed to a high risk of infection He therefore suggests that all Schick-negative nurses should be given a single stimulating dose of 0 5–1 c cm of TAF

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED MAY 9

Notifications —The following cases of infectious disease were notified during the week smallpox, 0 , scarlet fever, 1145 , whooping-cough, 1641 , diphtheria, 713 , paratyphoid, 7 , typhoid, 12 , measles (excluding rubella), 4725 , pneumonia (primary or influenzal), 1096 , puerperal pyrexia, 175 , cerebrospinal fever, 149 , poliomyelitis, 4 , polio-encephalitis, 1 , encephalitis lethargica, 3 , dysentery, 101 , ophthalmia neonatorum, 90 No case of cholera, plague or typhus fever was notified during the week

Deaths —In 126 great towns there were no deaths from scarlet fever, 1 (0) from an enteric fever 10 (0) from measles 14 (4) from whooping-cough, 22 (2) from diphtheria, 38 (8) from diarrhœa and enteritis under 2 years, and 30 (1) from influenza The figures in parentheses are those for London itself

Preston reported the fatal case of enteric fevers There were 4 deaths from measles at Birmingham Newcastle on Tyne and Birmingham each reported 3 deaths from diphtheria

The number of stillbirths notified during the week was 232 (corresponding to a rate of 36 per thousand total births), including 22 in London

Medical News

Royal College of Surgeons of England

At a meeting of the council of the college held on May 14, with Sir Alfred Webb Johnson, the president, in the chair, Mr J B Hume was re elected a member of the court of examiners for one year It was decided to recognise the post of house surgeon at the Hallam Hospital, West Bromwich, for the six months' surgical practice required of candidates for the final fellowship examination

A diploma of fellowship was granted to T R Sarjeant (Toronto and Guy's) Diplomas of membership were also granted to A C Sinclair and to the candidates named in our issue of May 9 (p 579)

University of Edinburgh

Dr J H Gaddum, professor of pharmacology at the College of the Pharmaceutical Society of Great Britain, has been appointed to the chair of materia medica in the university in succession to the late Prof A J Clark

Royal College of Surgeons of Edinburgh

At a meeting of the College held on May 15, with Mr J W Struthers, the president, in the chair, the following were admitted to the fellowship —

R D Baird M D Dalhousie , J M Barkla M B Edin , George Crowe, M B St And , W M Gray M R C S A R P Higgin, M B Sydney , Bruno Isserlin, M B Brist , E D P Murray, M B Aberd , Sydney Stanford M B Lpool , L O Watt, M D , Queen's Univ , Ontario , and W F Whelton, M B N U I

A Hospital Survey

The Minister of Health has appointed Mr E Rock Carling and Dr T S McIntosh to survey the hospitals (other than mental hospitals and mental deficiency institutions) in the Lancashire, Cheshire and North Wales and other neighbouring areas which look to these counties for hospital treatment, and to advise him what areas would appropriately be serviced by a hospital system centred on the teaching hospitals of Liverpool and Manchester and what modifications or extensions of the existing hospital facilities would be necessary to give effect to the Government's post war hospital policy

Medical Society for the Study of Venereal Diseases

A meeting will be held at 11, Chandos Street, London, W 1 on Saturday, May 30, at 2 P M , when Wing Commander G L M McElligott and Dr I N Orpwood Price will open a discussion on non-gonococcal urethritis

Socialist Medical Association

On Saturday, May 30, at 2 30 P M , at the Conway Hall, Red Lion Square, London, W C 1, Prof J R Marrack, Mr Aleck Bourne and Dr D Stark Murray will speak on the frustration of medicine

Royal Society of Medicine

The section of medicine will meet on Tuesday, May 26, at 4 30 P M , when Prof R A Peters, F R S , Dr R A McCance and Mr L J Harris, D Sc , will open a discussion on mineral and vitamin requirements in relation to war time dietary At 5 P M , on May 28, at the section of urology, Mr Terence Millin will read a paper on post prostatectomy obstruction

Nutrition Society

On Saturday, May 30, this society will hold a conference at the London School of Hygiene, Keppel Street, W C 1, on problems of collective feeding in war time Lord Woolton will open the meeting at 11 A M , and Squadron Leader J Salmon will read a paper on the organisation of mass catering Prof J C Drummond, D Sc , will speak on food supplies for collective feeding In the afternoon Squadron Leader T F Macrae, D Sc , will discuss the effects of large scale preparation on nutritional values and afterwards Miss M Abrahams, Mrs I M Clift, Miss M C Broatch and Mrs Winifred Parsons will take part in a symposium on the general dietetics of communal feeding

Messrs CHAS F THACKRAY of Leeds inform us that sulphaguanidine Lederle and sulphadiazine Lederle are now available in this country in tablet form, each tablet containing 0 5 g

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export

Appointments

BOHN, G L , M B LOND , F R C S surgeon to the Royal Berkshire Hospital, Reading

JACKSON, J S , M B GLASG , D P H asst M O H for Ayrshire

STERN, E S , M D CAMB , M R C P , D P M medical superintendent of the Central Hospital, Warwick

THOMAS E W , M B GLASG , F R C S E , F R F P S , R S O at Booth Hall Hospital for Children, Manchester

WHEELER, F E , F R C S E asst surgeon to the Royal Berkshire Hospital Reading

WILLIAMS HUNT, M B CAMB , F R C S E asst aural surgeon to the Royal Berkshire Hospital, Reading

WOLFE, FRANCES, M B DUBL R S O at Royal Liverpool Children's Hospital

Births, Marriages and Deaths

BIRTHS

BEVIR —On May 15, at Clifton, Bristol, the wife of Major G T Bevir, R A M C —a son

BIRD —On May 10, at Winchester, the wife of Surgeon Lieutenant M W Bird, R N V R —a son

DE CANDOLE —On May 13, at Cambridge, the wife of Major C A DE Candole, R A M C —a son

DUNLOP —On May 11, at Steeple Bumpstead, Essex, the wife of Dr J E Dunlop—a son

FERGUSON —On May 12, at Edinburgh, the wife of Surgeon Lieutenant R L Ferguson, R N V R —a son

GRAHAM —On April 26, at Blundellsands, the wife of Flight Lieutenant G D Graham M B —a son

NORMAN —On May 14, at Cambridge, the wife of Dr L G Norman —a son

PHEILS —On May 11, at Woking, the wife of Dr Murray Pheils —a son

ROSE —On May 12, at Braddyll Langho, near Blackburn, to Helen Kynoch (*née* Scott), wife of Dr D J Rose—a son

MARRIAGES

HUME—SHARP —On May 8, at Bradford on-Avon A James Hume, chief officer, Merchant Navy, to V Ruth Sharp, M B , Colonial Medical Service, Zanzibar

MYERS—VINE —On May 9, at Watford *Colin Edward Sefton* Myers, M R C S , captain R A M C , to Winifred Eileen Vine

DEATHS

OLIVER —On May 15 Sir Thomas Oliver, M D , LL D GLASG , F R C P D I , aged 89

WRIGHT —On May 7, at Overton, Ellesmere, Benjamin John Edward Wright, L R C P E , A K C , aged 80

SULPHAMETHAZINE

CLINICAL TRIAL OF A NEW SULPHONAMIDE

D W Macartney
M D Belf, D.P H

G. Stewart Smith
M D Manc

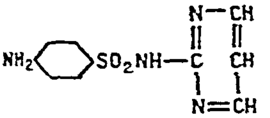
R W Luxton
M D B Sc Manc., M R C P

W A. Ramsay
T D, M D Glasc

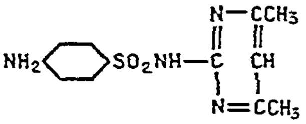
J Goldman, M B Manc

(From the Crumpsall Hospital, Manchester)

The history of the more important sulphanilamide derivatives is mainly that of the *p*-aminobenzene sulphonamido heterocyclic compounds (Ardley 1941) although other types such as sulphanilyl guanidine are available for special purposes Thus sulphapyridine and sulphathiazole are commonly employed Both exhibit similar therapeutic and toxic effects More recently, another drug of this kind the sulphanilamide derivative of



SULPHADIAZINE



SULPHAMETHAZINE

2-aminopyrimidine, has been introduced in America under the name sulphadiazine (Roblin et al 1940) This substance is said to have the same therapeutic range and efficiency as the earlier heterocyclic derivatives, moreover it is possible to achieve and maintain high blood concentrations without the appearance of toxic symptoms such as malaise, nausea and vomiting which are disadvantages of sulphapyridine and sulphathiazole (Long 1941) Sulphadiazine however is not without fault; like sulphapyridine it may give rise to renal complications due to the formation of crystals in the urinary tract (Leedham-Green 1941 Thompson Herrell and Brown 1941)

In the summer of 1941 our attention was drawn by Drs Martin and Rose of the research laboratories of Imperial Chemical (Pharmaceuticals) Ltd to a near relation of sulphadiazine—namely, 2-(4′-aminobenzenesulphonylamino) 4 6-dimethylpyrimidine, to which the name sulphamethazine has been given Laboratory examination of this substance had shown that it had the same order of therapeutic potency as the other heterocyclic compounds; in addition, the relatively high water solubility of the drug and its acetyl derivative, illustrated over a range of pH in table I suggested less chance of renal injury

TABLE I—SOLUBILITY IN WATER AT 37° C OF SULPHONAMIDE DRUGS AND THEIR CONJUGATED (ACETYLATED) FORMS BUFFERED TO GIVE A RANGE OF PH BY THE ADDITION OF THE SODIUM DERIVATIVES (Bevan, Martin and Rose 1942)

Drug	Solubility (mg per 100 c.cm solution)		
	pH 5 5	pH 6 5	pH 7 5
Sulphapyridine	61 0	61 3	61 8
Acetylsulphapyridine	32 6	34 1	36 5
Sulphadiazine	18 0	20 0	51 5
Acetylsulphadiazine	25 5	43 0	248
Sulphathiazole	95 0	103	192
Acetylsulphathiazole	5 8	6 0	25 1
Sulphamethazine	191	209	297
Acetylsulphamethazine	115	117	176

Sulphamethazine forms pale yellow crystals of the 1 enhydrate, m p 181°–182° C In our investigations it has been employed in this form and also as a 33% w/v solution of the sodium salt (pH 9 6)

This paper is mainly concerned with the results of a clinical trial of sulphamethazine in the treatment of lobar pneumonia, a note being made of its use in a few cases of meningococcal meningitis and of gonorrhœa

Three diagnostic criteria have been strictly adopted for each of the cases of pneumococcal lobar pneumonia included in this survey—(1) a history of pain in the chest and of rigor at the onset of the illness, (2) clinical and radiological evidence of pneumonic consolidation, and (3) the isolation and typing of a pneumococcus from the sputum As soon as the diagnosis was made, and before treatment was begun, blood for culture was taken and the procedure was repeated in 24 hours if pyrexia persisted In many of the cases the blood levels of the drug and the amount excreted in the urine were estimated Leucocyte counts were carried out on each patient as soon as practicable after admission further counts being done as necessary To simplify the interpretation of the results the usual expectorant mixtures were omitted

DOSAGE, BLOOD-LEVELS AND EXCRETION

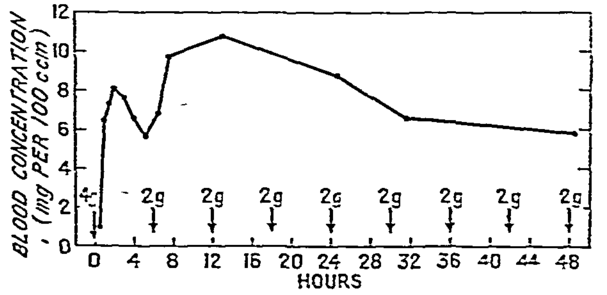
The dosage was decided partly from the experimental data in mice and partly from the estimation of the blood level of the drug following oral administration in specially selected patients not suffering from any acute disease Since it appeared to be well tolerated the pneumonia patients were given an initial dose of 4 g followed in most cases by 2 g every six hours or occasionally by 1 g every four hours This dosage was on the whole found satisfactory In critically ill patients where the blood level was less than 4 mg per 100 c cm 2 g was given every four hours until there was obvious clinical improvement

The sodium salt was supplied in ampoules of 3 c cm containing 1 g for intravenous use and was usually diluted with distilled water to 8 c cm No reactions were observed after injections of these relatively concentrated solutions

A full report on the pharmacology of sulphamethazine by Bevan Martin and Rose (1942) is in the press We are indebted to Mr H G L Bevan, B Sc, biochemist at Crumpsall Hospital for the following summary based partly on studies of the blood concentration of the drug on 30 pneumonia cases and many controls; partly on the estimation of the urinary excretion in 14 cases

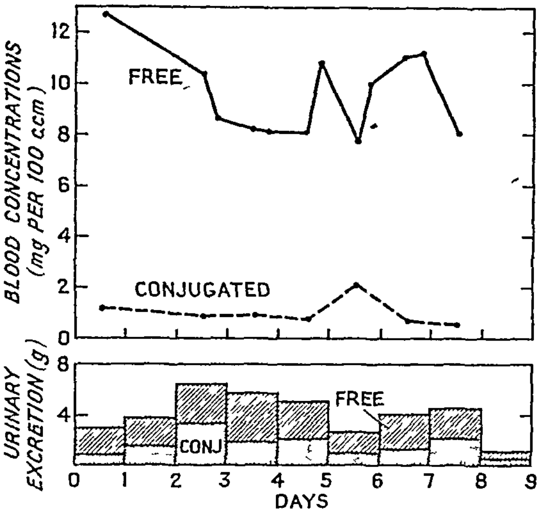
A blood concentration of approximately 8 mg per 100 c cm is usually reached in from one to three hours after the administration of 4 g by mouth On the standard dosage of 4 g followed by 2 g every six hours the blood level was extremely variable, as between individual cases ranging from 2 to 13 5 mg per 100 c cm, but in any given case the level while the drug was being taken kept reasonably constant An average level was 6 mg per 100 c cm The reasons for these wide variations which have been found with the other sulphonamides are not apparent Fig 1 shows the type of blood concentration obtained The highest blood concentration reached (in a control case) was 21 6 mg per 100 c cm A low blood level is usually associated with a relatively high concentration of the acetylated form in both blood and urine The urinary excretion over 24-hour periods is usually between 25 and 50% of the amount given by mouth but there are often periods of greater excretion reaching as high as 88% in one case The total recovery in the urine was usually rather less than 50% These results (fig 2) are similar to those reported for sulphadiazine (Reinhold et al 1941, Sadusk et al 1941)

Fig 1



Three control cases were given an intravenous dose of 1 g Two gave zero figures for the free substance in six hours but the conjugated compound was still present The third case did not reach zero in ten and a half hours In these cases the initial blood level of the drug, within a quarter of an hour of the injection, averaged 5 mg per 100 c.cm From 50 1 to 61 7 per cent was recovered from the urine in 24 hours Fig 3 illustrates one of these experiments

Fig 2



The concentration of sulphamethazine has been estimated in the cerebrospinal fluid in six cases, and in four of these where the blood level was estimated at the same time the concentration in the cerebrospinal fluid was from 50 to 80% of that in the blood In two cases with pleural effusion the drug level in the pleural fluids was slightly higher than that in whole blood

No abnormal blood-pigments were found, cases having a high blood level or on large doses being specially examined

RESULTS OF CLINICAL TRIAL

In all, 71 cases of pneumococcal lobar pneumonia, using the diagnostic criteria previously noted, were treated with this drug The results are shown in table II The series comprised 55 males and 18 females The total fatality was 5 out of 73 cases, which is similar to the figure of 6 7% found in our larger series treated with sulphapyridine (Dorr et al 1940) Of the fatal cases, 4 were bacteræmic, 3 giving a pneumococcus type I and 1 a pneumococcus type II, while 10 bacteræmic cases recovered

TABLE II—CASES OF LOBAR PNEUMONIA TREATED WITH SULPHAMETHAZINE

Types	Under 40 years		Over 40 years	
	Recovered	Died	Recovered	Died
I	23 (1)	1 (1)	19 (6)	2 (2)
II	4	0	5	1 (1)
III	0	0	2	0
IV	0	0	2 (1)	0
V	5	0	2 (2)	1
VI	1	0	1	0
VIII	2	0	1	0
XIX	1	0	0	0
Total	36 (1)	1 (1)	32 (9)	4 (3)

Figures in parentheses indicate bacteræmic cases

Clinical improvement was generally noticed within 24 hours of the commencement of treatment and was similar to that following sulphapyridine therapy The striking difference, however, was that the patients never complained of the severe mental and physical depression which often accompanies sulphapyridine treatment In no case was cyanosis observed, while nausea and vomiting occurred in only 5 of the 73 cases and were not sufficient in degree or duration to interfere with the continuation of oral treatment

In this series 2 patients only developed complications of pneumonia A woman aged 52, with a positive type I blood-culture, died from pneumococcal meningitis and endocarditis Another, a man, developed slight jaundice three days after the cessation of treatment, he made a good recovery Two patients who had small collections of pus in the pleural sac on admission to hospital cleared up without surgical-intervention

CASE-RECORDS

The following cases are worthy of brief description

1 —Male, aged 45, with a positive blood culture, type I, admission On routine dosage by mouth the blood reached a maximum of 2 3 mg per 100 c cm The ture did not return to normal in the usual way and as were clinical signs of a spread of the pneumonic process in lung 1 g of the sodium salt of sulphamethazine was intravenously followed by 2 g four-hourly by mouth blood level rose to 11 3 mg and immediate clinical impro ment followed

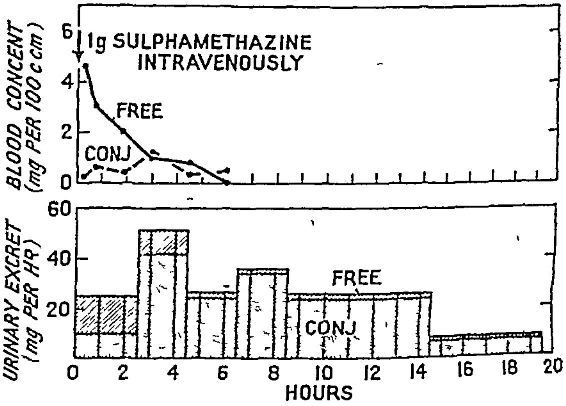
It is not necessary to control all sulphonamide therapy blood level estimations but this case suggests that clinical improvement is delayed or absent such an may be of value and may indicate the need for intravenous administration

2 —Male, aged 41, with a positive blood culture, type I, on admission, mitral stenosis and auricular fibrillation, recovered and the heart rhythm returned to normal

3 —Female, aged 37, seriously ill with a type I infection Found to be suffering from chronic myeloid leukæmia but recovered from the pneumonia

4 —Male, aged 49, admitted with clinical signs of consolidation of the lower two thirds of the right lung and auricular fibrillation He had been treated with 12½ g of sulphapyridine at home and had vomited copiously The blood urea on admission was 296 mg per 100 c cm and hyaline and granular casts were present in the urine He was treated with sulphamethazine for 2 days and left hospital fully recovered 23 days later with a blood urea of 52 mg per 100 c cm

Fig 3



5 —Male, aged 51, had pneumonic consolidation of the right upper and middle lobes (type III) Leucocyte count 4800 per c mm on admission Given routine sulphamethazine treatment and 60,000 units of type III antiserum The leucocytes rose to 7700 and recovery followed

Post-mortem examinations were made on all the fatal cases and the following notes are given

6 —Male, aged 37, with a long history of *bronchitis* Extensive consolidation of the right middle and lower lobes and positive blood cultures (type I) Treated with 2 g of sulphamethazine four hourly but the blood level of the drug never exceeded 5 mg per 100 c cm The autopsy showed breaking down grey hepatisation of the right middle and lower lobes

7 —Male, aged 76, admitted on the 12th day of illness and lived for 7 days There was complete consolidation of the left lung, the blood culture giving a growth of a type I pneumococcus on two occasions Treated with 2 g every four hours Autopsy showed extensive grey hepatisation in the left lung surrounding bronchiectatic cavities

8 —Male, aged 54 Admitted on the 4th day of illness and lived for 15 days Pneumonic consolidation present in the right lower lobe Type II pneumococci were isolated from blood and sputum He received altogether 134 g of sulphamethazine At autopsy, in addition to the pneumonic consolidation in the right lung, bronchiectasis was found in both lower lobes and there was a large amount of clear amber fluid in both pleural sacs and in the peritoneal cavity, indicating death from cardiac failure

9 —Female, aged 52 Had signs of pneumonic consolidation in the right upper lobe and the blood gave a growth of a pneumococcus type I Signs of meningitis developed, and at autopsy, in addition to unresolved pneumonia in the right

upper lobe, there was purulent meningitis and aortic pneumococcal endocarditis

10 —Male, aged 52 Admitted on the 8th day and was then considered to be moribund Given 2 g of sulphamethazine every four hours by mouth, 1 g intravenously and 2 g intramuscularly Slight improvement for 3 days but he relapsed and died after 5 days in hospital At autopsy there was grey hepatisation of the right upper and lower lobes A type v pneumococcus was isolated from sputum and from lung culture

Meningococcal meningitis —Six cases of this disease, including one in which the organism was isolated from the blood, were treated with sulphamethazine Two patients were unconscious on admission and had to receive intravenous doses, consciousness was regained within six hours All made a full recovery

One of these patients, a woman aged 25, was catheterised 15 hours after admission because she had not passed urine during that time The urine contained blood which could be detected macroscopically but microscopic examination did not show any crystals or casts The drug was continued and the urine gradually cleared, the blood urea did not exceed 37 mg per 100 c cm There is no evidence in this case of the condition of the urine before sulphamethazine was given but it appears probable that the hæmaturia, found so early in the case, was not due to the two doses of the drug

Gonorrhœa —Sulphamethazine has been used in nine male ambulatory cases of gonorrhœa treated in hospital with 2 g every four hours for five days followed by an interval of two days after which the original course was repeated The urethral discharge rapidly disappeared and the usual tests of cure, including the beer test, gonococcal vaccine and prostatic massage, were satisfactory

TOXICITY

In view of the toxic symptoms or disagreeable effects which are at times associated with sulphonamide therapy the patients were carefully watched for any evidence of the usual signs of toxicity or intolerance Nausea and vomiting were much less frequent with sulphamethazine than with sulphapyridine and on the few occasions when they were encountered they were purely transient and disappeared without interruption of treatment Cyanosis did not occur One of the pneumonia cases had a slight morbilliform rash while a patient undergoing prolonged treatment for another infection developed a bright pink macular eruption

In no case did the drug produce evidence of renal damage The urines were repeatedly examined for crystals, always with a negative result, even in a case where the concentration of sulphamethazine in the urine reached 1%, of which 64% was in the conjugated form The one case of meningitis in which hæmaturia was found has been discussed There was no evidence of agranulocytosis or of any disturbance of erythropoiesis Drug fever was not observed in any of the pneumonia cases but a male patient, aged 21, having treatment for gonorrhœa showed the typical signs of this condition

DISCUSSION

The ideal sulphonamide is one which combines the maximum therapeutic efficiency with the minimum risk of toxic effects Any new preparation for the treatment of pneumonia must be compared with sulphapyridine and sulphadiazine, both highly efficient drugs Of the former we have had a large experience, while favourable results from the use of sulphadiazine have been reported in America

We believe that sulphamethazine is as effective as sulphapyridine in the treatment of lobar pneumonia Owing to its high solubility it is more rapidly absorbed than sulphapyridine and so it is possible to reach a high blood level more rapidly In this respect it is similar to sulphadiazine (Peterson et al 1941) Since the rate of excretion of sulphamethazine is lower than that of sulphapyridine, less frequent doses are required in order to maintain a high blood concentration An average blood level of 6 mg per 100 c cm was obtained on our standard dosage

One of the major disadvantages of sulphapyridine is its tendency to cause cyanosis, nausea and vomiting This has been noted repeatedly and was encountered fairly frequently our sulphapyridine series (Don et al 1940) Our experience with sulphamethazine is that nausea and vomiting are much less likely to occur, and in more than 100 cases have never been sufficiently severe to interfere with treatment The drug, moreover, does not appear to cause cyanosis The published reports on sulphadiazine indicate that with this preparation also nausea and vomiting are less frequent than with sulphapyridine Both sulphapyridine and sulphadiazine are liable to cause renal damage, possibly due to a mechanical action of crystals of the drugs which may be excreted in the urine Leedham-Green (1941) described several reported cases in which yellowish-white gravel and calculi in the kidneys have followed the administration of sulphapyridine, while Finland and others (1941), in reporting a series of 446 cases treated with sulphadiazine, give an incidence of crystals in 7 8% of patients, with hæmaturia in 0 7% The evidence is that permanent renal damage with both these preparations is rare, but a significant increase in the non-protein nitrogen in the blood has been reported in approximately 1 1% of cases after sulphadiazine (Finland, *loc cit*) Sulphamethazine and its acetyl derivative are so soluble that renal damage from crystal formation should never occur

The results obtained in the few cases of meningococcal meningitis and gonorrhœa indicate that the preparation is likely to be highly efficient here also but from preliminary trials comparison with the other sulphonamides in the treatment of these diseases cannot be made

Owing to the extreme variability in the absorption and excretion of sulphonamides in different individuals and to the necessity for maintaining a high blood concentration of the drug in serious cases it seems advisable to estimate the blood level in all cases where clinical improvement is delayed, and if necessary to give the sodium salt intravenously This has been used with success in those cases of meningococcal meningitis where oral administration is impracticable

SUMMARY

A clinical trial is reported of sulphamethazine, a new sulphonamide preparation, in 73 cases of lobar pneumonia and a few cases of meningococcal meningitis and gonorrhœa The preliminary results suggest that the preparation has high therapeutic efficiency and on account of its high solubility is unlikely to cause renal damage The incidence of nausea and vomiting is much less than with sulphapyridine and cyanosis is absent

We thank Imperial Chemical (Pharmaceuticals) Ltd for drawing our attention to sulphamethazine and for supplying us with the drug

REFERENCES

Ardley D G (1941) *Lancet* ii 625
Bevan H G L, Martin, A R and Rose F L (1942) In the press
Don, C S D, Luxton, R W, Donald, H R Ramsay, W A, Macartney, D W, Stewart Smith, G and Adderley, C H (1940) *Lancet*, i, 311
Finland, M Strauss, E. and Peterson, O L (1941) *J. Amer med Ass* 116 2641
Leedham-Green, J C (1941) *Brit med J* i, 586
Long, P H (1941) *J Amer med Ass* 116 2399
Peterson, O L, Strauss E, Taylor, F H L and Finland, M (1941) *Amer J med Sci* 201, 357
Reinhold J G, Flippin, H F, Schwartz, L and Domm, A H (1941) *Ibid* 201, 106
Roblin, R O jun, Williams, J H, Winnek, P S and English, J P (1940) *J Amer chem Soc* 62, 2002
Sadusk, J F and Tredway, J B (1941) *Yale J Biol Med* 13 539
Thompson, G J Herrell, W E and Brown A E (1941) *Proc Mayo Clin* 16, 609

As few people are now using public shelters in London and the most dangerous season for epidemics has passed, nearly all the shelter medical aid posts in the London civil defence region are to be temporarily closed and put on a care and maintenance basis Only the posts in the shelters or groups of shelters which are still regularly used by 500 persons or more will be kept open Doctors will still be on call to deal with emergency cases in the shelters

SPHAGNUM —As in the last war, sphagnum moss has been collected as a substitute for cotton wool, and the article turned out today is much superior to that produced in the last war The packs have been standardised and there need be no reluctance to use them Sphagnum is not intended to replace sterilised cotton wool dressings in bone and joint surgery, but it is highly satisfactory for padding splints, and its use for this purpose will effect an important economy Its great use is for the absorption of copious discharges, from sinuses, colostomies and so on.

VITAMIN-C LEVELS OF SCHOOL-CHILDREN AND STUDENTS IN WAR-TIME

LESLIE J HARRIS, SC D CAMB, D SC MANC

(*Dunn Nutritional Laboratory, University of Cambridge and Medical Research Council*)

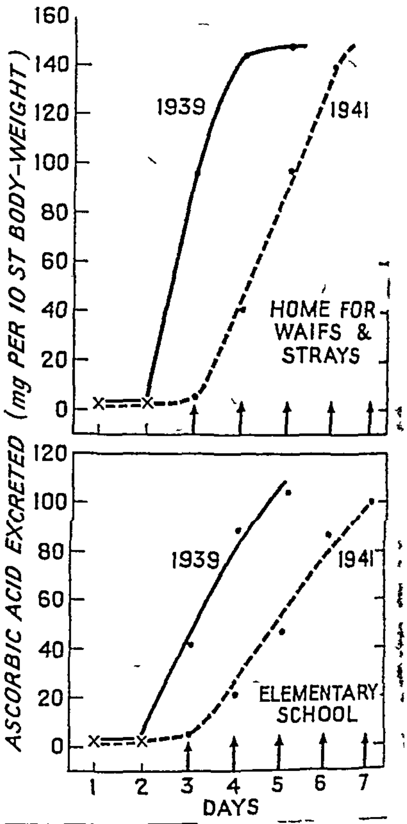
ABOUT three years ago surveys were carried out locally on various classes of school-children to determine their status in vitamin C[1] Since the war further surveys have been in progress on the same groups of children and are instructive as showing the degree to which their reserves have fallen, consequent on restriction in the supply of fresh fruits and other sources of the vitamin A few similar tests have also been done on university students and research workers, and are included for comparison

METHODS

The methods were identical with those previously used Standard test doses (700 mg per 10 stone of body-weight) of ascorbic acid are given daily, and the number of days counted until the body's reserves are approaching saturation, as indicated by the rise to a plateau in the curve of urinary excretion The smaller the subject's past intake of vitamin C the longer the delay before saturation is attained

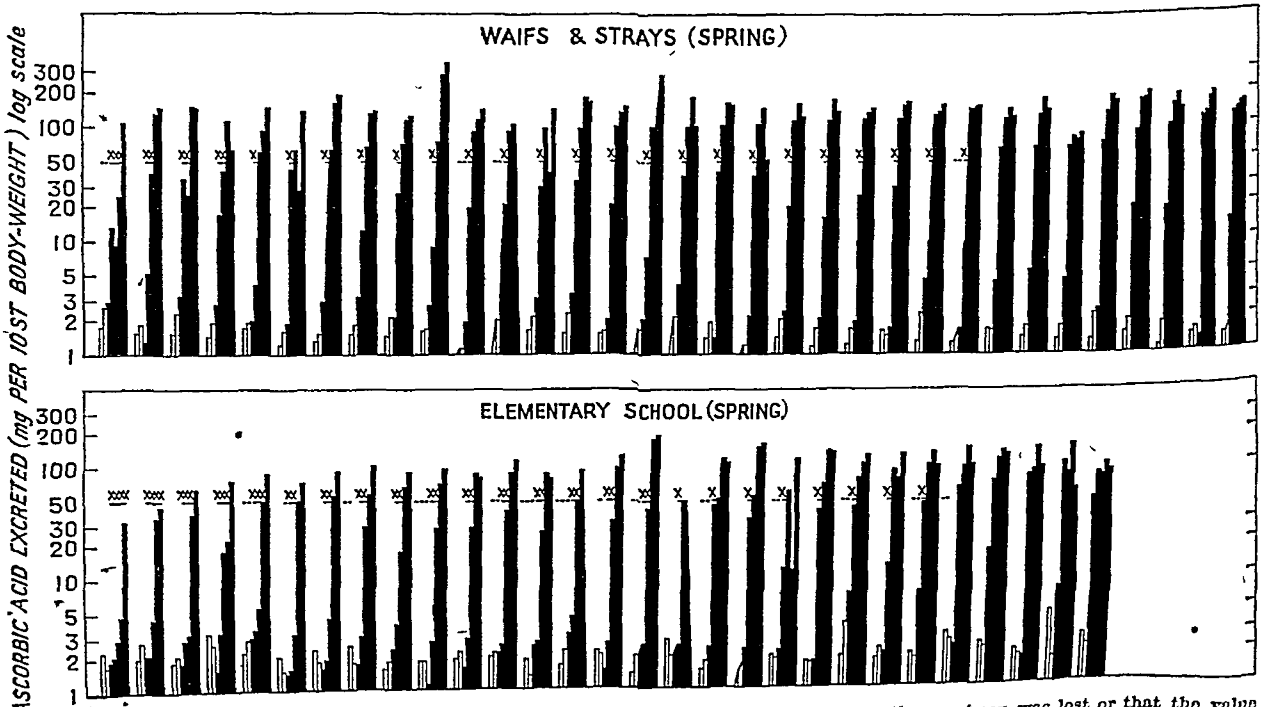
The procedure has been to give the test doses, made into a palatable drink with lemonade powder (innocent of all vitamin C) at 10 30 A M during morning school, and then during afternoon school to collect urine between 2 P M (when the bladder is emptied and the specimen discarded) and 4 15 P M (when the bladder is emptied for the second time and this 2¼ hour specimen collected) The afternoon period is chosen to cover the daily peak of response about 4–6 hours after each test dose The vitamin C is determined by titration against 2, 6-dichlorophenolindophenol, with the precautions previously recorded There is no question that the immensely increased titres resulting on saturation after test doses are due specifically to vitamin C It is immaterial that the blank value (resting level before test dosing begins) admittedly contains small amounts of non-specific reductants A subject whose past intake of the vitamin has been adequate, judged by accepted standards, responds by a satisfactory rise on the first or second day of dosing, while with increasing degrees of deficiency there is an increase in the number of days before the attainment of saturation In all instances the final plateau of excretion, indicating the attainment of saturation, is about 100–200 mg per 10 stone for the 2¼ hour *period under the* specified conditions In assessing results the days are counted until the sharply rising curve reaches a level of about 50 mg per 10 stone which, again under the specified conditions, marks approximately a lower limit for full saturation Subjects still *failing to reach* 50 mg on the second day of test dosing are

2



Average of saturation curves for two classes of-boys, April 1941 compared with a similar period in 1939 Both classes have dropped *considerably from* their prewar position, although the boys at the residential home are still at a relatively higher level than those at the elementary school Test doses given on days marked by arrow

1

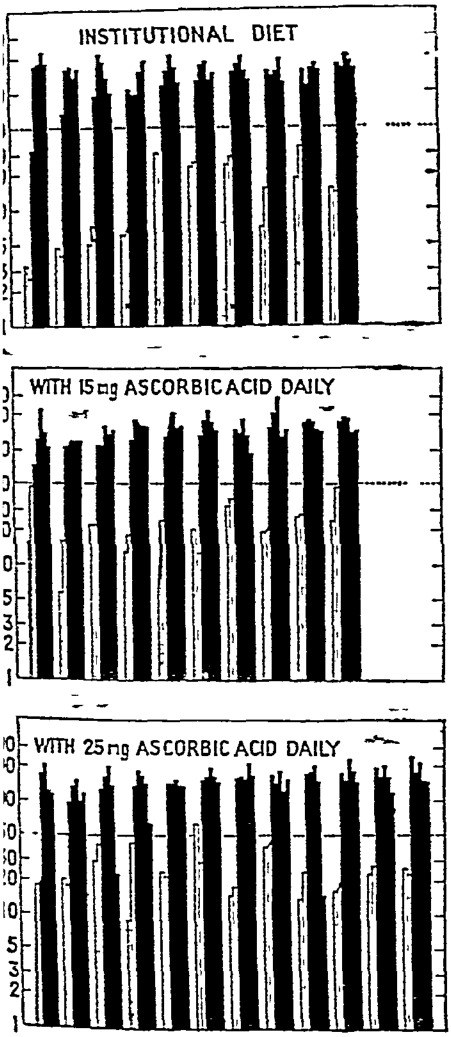


Above, saturation tests on 33 boys at a home for waifs and strays, below on 29 boys at a poor class elementary school March–April 1941 Two days resting levels (open columns) followed by 5 days test dosing (black columns) Sloping columns denote that a portion of the specimen was *lost* or that the value has been inserted by interpolation × = one day late in response, × × = two days late and so on Compare corresponding charts made before the war (Harris 1940, fig 1)

---

[1] Harris, L. J *Lancet*, 1940, ii, 259

3



Saturation tests on boys at residential home after summer season (October 1941) Compare prompt response here with more delayed responses in fig 1 The high degree of saturation is apparent also from the high resting levels a large fraction of the vitamin C given with the midday meal being excreted during the afternoon Note occasional irregular drops after long-continued saturation.

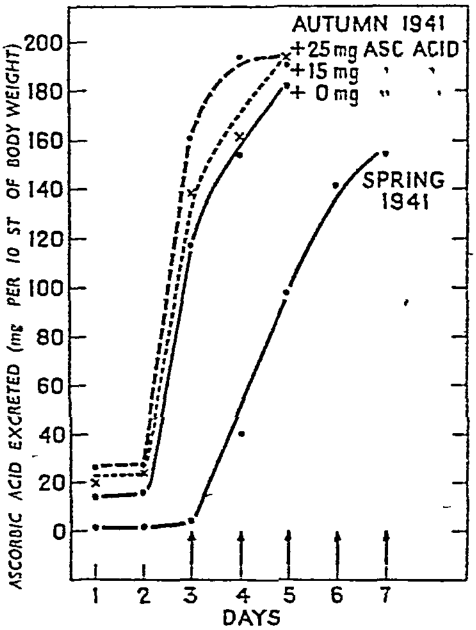
described as below standard and each subsequent day beyond is counted as a further degree of subnormality In fully developed scurvy about 7–10 days may be needed before saturation approaches completion This figure gives us a measure to judge the extent to which any given subject has dropped on the path toward scurvy

RESULTS

Comparison of levels before and during the war (winter season) — Two groups of boys, one residing at an institution for waifs and strays and the other attending a poor-class elementary school in the same town, were examined in the spring of 1941, so that they might be compared with the two corresponding groups of boys of the same age and circumstances examined before the war, during the spring of 1939 It was found that there had been a considerable drop in the levels of both groups in consequence no doubt of the diminished supply of fresh fruits available in war-time especially during the winter—for example, before the war the dietary at the residential institution included an orange daily As had previously been observed in peace-time, the levels were notably better at the well managed institution than among the boys from the poor homes Both groups were thus in the same relative position as before the war but both had declined considerably below their pre-war status Fig 1 gives the records of these saturation tests, while the average curves in fig 2 show at a glance the extent to which the degree of saturation has fallen since the war From the final analysis of results (see table) it will be noted that, whereas before the war all the boys at the institution on the improved diet were up to standard (i e became saturated on the first or second day) at the corresponding season during the war 21 out of 33 were slightly below standard (i e, one day late in response) and 4 were more severely below standard (needed four or five days dosing) As many as 16 out of 29 boys from poor homes were in this latter category, and 2 of them still remained unsaturated after five days

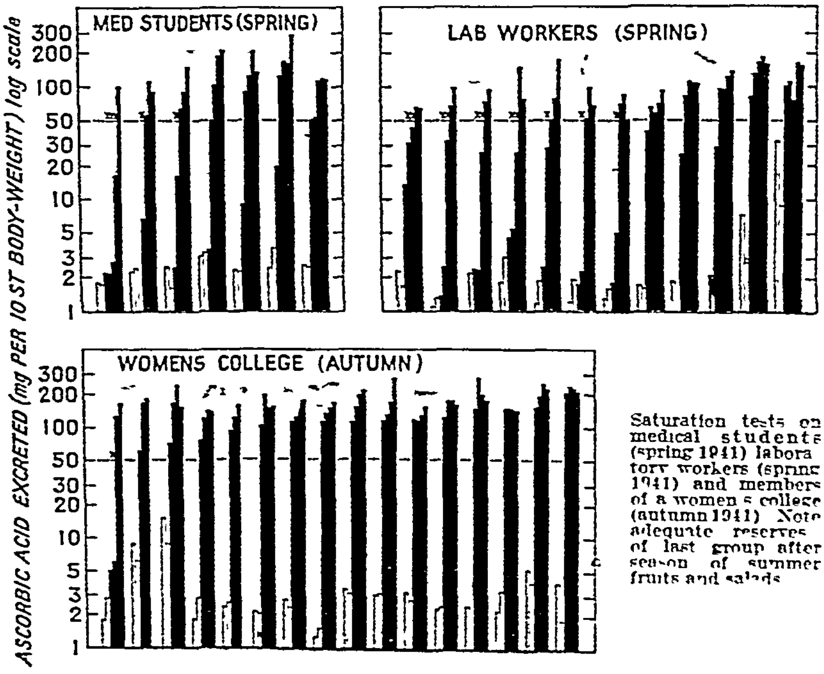
Seasonal variation — The tests just described were purposely carried out in the spring because that is the season when the reserves of vitamin C are always at their lowest after the comparative shortage of fresh fruits and salads during the winter It is also in the winter that war-time restrictions are most felt, since with the return of summer it again becomes possible (given good domestic management) to serve more ample amounts of home-produced fruits and salads Tests carried out on the boys at the institution at the close of the following

4



Average of saturation curves for boys at residential home (1) after winter (April 1941) (2) after summer (October 1941) showing the improvement in their 'reserves' after the season of summer fruits and vegetables, and (3) and (4) after summer with graded supplements of synthetic ascorbic acid in their dietary, showing further graded improvements

5



Saturation tests on medical students (spring 1941) laboratory workers (spring 1941) and members of a women's college (autumn 1941) Note adequate reserves of last group after season of summer fruits and salads

SUBJECTS CLASSIFIED ACCORDING TO THE NUMBER OF DAYS NEEDED TO SATURATE THEM AN INCREASING
OF DAYS DENOTES AN INCREASING DEGREE OF UNSATURATION

—			Date tested	No examined	No becoming saturated after Days—1	2	3	4	5	>
Boys, good institutional diet	unsupplemented	(prewar, winter)	Spring 1938	25	15	8	2	0	0	0
	+ daily orange	(,, ,,)	,, 1939	29	25	4	0	0	0	0
	unsupplemented	(war time, winter)	,, 1941	33	0	8	21	3	1	0
	unsupplemented	(war time, summer)	Autumn 1941	10	9	1	0	0	0	0
	+ 15 mg ascorbic acid daily	(,, ,,)	,, 1941	10	10	0	0	0	0	0
	+ 25 mg ascorbic acid daily	(,, ,,)	,, 1941	12	12	0	0	0	0	0
Boys, elementary school, home diets, unsupplemented		(prewar winter)	Spring 1938	35	10	11	9	5		0
		(war time, winter)	,, 1941	29	1	4	8	11	3	2
Research workers and assistants, home diets (war time, winter)			Spring 1941	12	2	3	3	4	0	0
Medical students, college diets (war time, winter)			,, 1941	7	1	3	2	0	1	0
Undergraduates, women's college (war time, summer)			Autumn 1941	16	15	0	1	0	0	0

summer (1941) proved that, notwithstanding the war the reserves were by then excellent All the boys examined were up to standard (fig 3, top group)

Effect of graded supplements —Graded supplements of ascorbic acid added to the summer diet produced further graded improvements in the response Three groups of boys were included in this test, 10 boys received no supplement, 10 boys a supplement of 15 mg daily, and 12 boys a supplement of 25 mg daily The results of the urinary analyses are charted in fig 3 In fig 4 are given the average saturation curves, for a final comparison of the results at the institution, both after the winter and after the summer with and without the graded supplements An incidental finding, in agreement with our previous reports, is that with generous intakes of the vitamin there occur appreciable increases in the average resting levels (i e , normal excretion without test dosing)

Further work is in progress in which the daily intake of vitamin C is being accurately assessed during the winter, and supplements are provided for some groups of children to bring it up to the reputed optimal requirement saturation tests will then be carried out as before

Tests on research workers and students —Similar tests have been carried out during the past year or so on groups of 12 research workers, 7 medical students and 16 members of a women's college The two former groups were tested after the winter and the latter after the summer The records are shown in fig 5 Although the number of cases examined is not large, it seems safe to conclude that the general trend is the same as for the boys—excellent reserves in the summer, but a larger proportion below standard in the winter than was common for such subjects, in our experience, before the war Relatively few of the research workers and students were however so severely below standard as some of the poor-class children Thus, over half of the poor children needed more than three days test dosing during the winter to bring them up to saturation level, whereas only about a quarter of the adults were so low in their reserves (5 out of 19)

COMMENTS

The results are in keeping with expectation Few foods rich in vitamin C are available at present during the winter Indeed unless good helpings of potatoes and greenstuffs (sprouts, cabbages, &c) are taken it is difficult to see how the reputed requirement can be attained Roughly 11 oz of boiled potatoes[2] each day or 15 oz of cabbage weekly would be needed to provide only 15 mg of the daily 30 mg (League of Nations requirement) In summer of course the problem becomes easier Our results may thus serve a useful purpose in emphasising the need for a liberal intake of potatoes and greens during the winter They also confirm the wisdom of the decision to provide free vitamin C for babies That the matter is of more than academic interest is apparent from recent reports of an increased incidence of scurvy among children[3] In control tests in Germany during the war the provision of 50 mg of synthet ascorbic acid daily for school-children as a prophylact has increased resistance to infection and accelerat physical development[4]

SUMMARY

Children at a poor-class elementary school and at well-conducted residential institution were examine for their levels in vitamin C. As in previous surve those at the institution were found to be at a higher lev than those from the poor homes Both groups wer however, considerably lower than the correspondin groups examined before the war (for example in 1938–39 The difference is attributed to the decreased supply foods rich in vitamin C

A considerable seasonal fluctuation was noted at th residential home, levels being low after the wint and much better after the summer when foods rich i vitamin C are more readily available

Control groups who had been given graded supplements of synthetic vitamin C with their daily dietar for some months were found on test to be correspondingl graded in their vitamin-C levels This gives furthe evidence of the reliability of the method of test

Middle-class university students and scientific worker seemed on the whole to have been affected less than th poorer children in their "reserves" of vitamin C, bu again there was evidence of a strong seasonal tide, th level of members of a women's college examined at th end of the summer being highly saitsfactory

The results confirm the need for care in ensurin adequate intakes of potatoes and greens as sources vitamin C in winter

I wish to thank Mr Alfred Ward for his technical cooper tion, Mr W E H Billing and Mr J W Palmer for permittin the tests to be done on the children in their care, and Roc Products, Ltd , for the gift of the ascorbic acid

CRITIQUE OF THE SATURATION METHOD FOR DETERMINING VITAMIN-C LEVELS

LESLIE J HARRIS

THE object of the saturation test, as used in the wor described in the foregoing paper, is to give a quantitati index of a subject's level of nutrition in vitamin C From the result of a test we are able to say whether th subject has high, moderate or low reserves of the vitamin and if we accept the current standard for the dail requirement (30 mg per day) we can assess sufficientl accurately whether the intake has been up to th standard or not, if it is below, we can express the degre of deficiency on a numerical scale based on the numbe of days delay before attainment of saturation

That the method works in practice is evident from th fact that when subjects are given graded intakes of th vitamin they do in fact show correspondingly graded responses on test Numerous investigators have used the method with satisfaction [2 6 8 9 11 15 16 18 20 24 25] but since various criticisms of the principle of the test are still occasionally expressed or implied [21 26] it seems necessary to consider them here

---

[2] Calculated for old potatoes somewhat less necessary with new These figures assume that the best methods of cooking have been used and that there has been no loss from wilting before cooking, which is often not true

[3] e g , Paterson D and Davnes, W A *Brit med J* 1941, ii, 787

[4] *Bull War Med* 1941, 2, 6

The supposed objections to the test raised at one time or another may be enumerated—exhaustively, I believe —as follows

1 The method used for the titration does not measure vitamin C exclusively

2 The standard taken as representing the attainment of saturation is uncertain

3 After the attainment of saturation, excretion fluctuates appreciably from day to day

4 Individuals vary in their response

5 Other factors (fever, muscular work, kidney function) influence the excretion

6 The alternative method of analysing the blood for vitamin C is preferable to the urinary saturation test

7 The requirement depends on the body weight or on the age of the subject

8 The accepted standard for the requirement of vitamin C is unnecessarily high

9 A subject may be well below standard yet still in apparently good health provided scurvy has not supervened a low intake of vitamin C causes no ill effect

10 Similarly a state of complete saturation, considered by some to be necessary for optimum nutrition, is not in fact necessary

11 Vitamin C, unlike vitamin A for example, is not stored in large quantities in the tissues, hence it is misleading to refer to the "reserves" of it (as above)

12 Presumably a subject can adapt himself to low and high levels of intake of the vitamin, and the response to test doses will then vary accordingly

CRITICISMS CRITICISED

These criticisms may be considered in order

1 *Specificity of titration*—The assessment of the result depends on the immense increase in the excretion when a person originally at a low level has attained saturation after repeated test doses This excretion at saturation is of a different order of magnitude to the original low resting level, and hence any non-specific reduction (blank) in the latter figure does not significantly affect the accuracy of the calculation This is familiar to investigators with any practical experience of the method, for there is no mistaking when saturation is approaching, since it then becomes necessary to dilute the urine greatly (e g , 10 times) before making the titration It is of course possible to use a method which is theoretically more specific, but the technique is then so much more involved that it is doubtful if any practical advantage is gained

2 *Standard representing saturation*—When a subject at a low level is given daily test doses until saturated, the attainment of saturation is marked by a *steep* rise in the chart (see, for example, fig 1 in the foregoing paper) Hence in practice it makes little difference which precise figure is taken as representing arbitrarily the lower limit for saturation Examples demonstrating this, using several alternative standards, were given in an earlier publication [12] The proposed standard of 50 mg is suitable when test doses of 700 mg per 10 stone are employed with a 2¼ hour collection period 6 hours afterwards, because, as reference to the charts in that earlier publication will show, the plateau of excretion at saturation is almost invariably somewhat in excess of 50 mg , for these conditions If surveys are conducted under different conditions (e g , taking 24 hour specimens of urine or using doses other than 700 mg per 10 stone) it becomes necessary to ascertain by trial the appropriate level of excretion representing the lower limit for saturation

3 *Fluctuations after saturation*—Although for convenience I have referred to the plateau of excretion after saturation, it does not remain strictly a plateau indefinitely, for after one or more days at the high level sudden drops may be encountered, due presumably to an effect of the continued massive intake on kidney function It has been argued that this fluctuation makes it difficult to fix a low limit for saturation In practice the supposed difficulty does not arise, since the initial level of the plateau is always approximately the same —100–200 mg per 10 stone for the 2¼ hour test period

4 *Individual variations*—Subjects kept on the same intake of vitamin C have shown less variation within the group than might perhaps have been expected The small variation within the group is relatively insignificant compared with the effect of any important change in the vitamin-C intake For example in table I of the foregoing paper it will be seen that in a group of children at an institution on a fixed diet with one orange daily (spring 1939), 25 out of 29 were saturated on the first day and the remaining 4 on the second day , when the diet contained less vitamin C (spring 1941) 21 out of 33 were not saturated until the third day and all but one of the remainder were saturated either on the second or fourth day On still poorer diets the time for saturation was still further increased The scatter is therefore not a serious factor

5 *Effect of fever and other factors*—In fever and infectious diseases, notably phthisis, the vitamin content of the tissues is diminished,[14] and correspondingly a larger amount of the vitamin is needed in the diet to produce saturation, as measured by the outflow into the urine [1] This seems to imply an increased requirement for, or usage of, the vitamin in fever Thus the fact that patients with tuberculosis take more vitamin C in test doses before they become saturated than normal subjects on the same diet gives a correct index of their presumed greater needs and their lower initial saturation The same considerations may apply to subjects doing hard physical work It is pertinent to recall that vitamin C is lost in measurable amount in the sweat

6 *Analysis of blood as an alternative method*—When the dietary intake of vitamin C is at first low and is then slowly increased, the level in the blood rises until finally an almost constant level is reached beyond which further additions cause relatively little further rise It seems reasonable to suppose (as is indeed already accepted for iron, calcium, phosphate, &c) that the amount which is needed to maintain the constant level in the blood is the optimum intake Certainly it is safe to conclude that if the blood level is at this maximum the intake is satisfactory , it is perhaps less certain that a lower level necessarily implies unsatisfactory nutrition The determinations on blood and urine are closely related, since when the blood and tissues become saturated the excess of vitamin is lost in the urine Both methods are useful There appear however to be two advantages for the urine test First, the technique is easier, since (*a*) less chemical manipulation is involved, and (*b*) urine is more readily offered by school-children, factory workers, Service personnel and so on than blood Secondly, a subnormal level in the blood probably gives less clear quantitative evidence of the exact extent of the deficit than can be obtained from loading tests with measurements of the amount of vitamin retained

7 *Requirements in relation to body-weight*—Relatively more vitamin C appears to be needed by the young organism than by the adult * One indication of this is that relatively more is needed to raise the amount in the blood to the "constant-level" maximum which in turn is associated with the excretion of excess in the urine As a rough but probably sufficiently accurate approximation we have assumed that the absolute amount of ascorbic acid needed by the school-child is as much as that needed by the adult, but we have given test doses

---

* Sybil Smith [22] after a comprehensive review estimated the daily requirements as approximately 50–60 mg for adults, 40 mg for children and 20 mg for infants These she regards as the *middle* or barely adequate consumption levels with but little margin of safety The minimal requirement needed for certain protection against scurvy appears to be in the neighbourhood of 15–20 mg for an adult Thus 12 cases of scurvy were seen in 950 native mine labourers receiving 12–25 mg daily by Fox and his colleagues [7] Esquimaux need about 15 mg to prevent scurvy and about 25 mg seems necessary to restore capillary fragility to normal according to Göthlin and his colleagues [10] The League of Nations (marginal) standard is 30 mg per day for an adult [17] The United States National Research Council [23] considers the desirable intake for an adult to be 75 mg per day , and similar 'optimal' requirements (75–100 mg) are given by other authorities A German official [19] advised 30–50 mg per day

In my experience an intake not greatly in excess of the League of Nations marginal standard will suffice to keep the organism at such a level that saturation as already defined is reached on the second day of test dosing With the higher intakes (75–100 mg) saturation will be completed on the first day of dosing (i e , the organism is in a state of pre existing saturation) in proportion to body-weight and reduced the values for the excretions to a body-weight basis That this procedure although not ideal is good enough for its purpose is suggested by the observation that the excretions calculated on this body-weight basis are equal as between adults and school-children—about 100–200 mg per 10 stone at saturation in the 2¼ hour period

8 *Standard for daily requirement* —It has sometimes been argued that the daily requirement as fixed by the League of Nations committee (30 mg per day) is unnecessarily high Until some other equally authoritative standard is propounded we prefer however to refer our findings to the League of Nations value Our experimental findings would remain valid for comparative purposes, even if the standard should be subsequently lowered (or raised), just as a comparison of hæmoglobin levels in different sections of the community would still stand even if the standard of reference were shifted from 100% to, say, 90% or 80%

9 *Deficiency in absence of symptoms* —There are still those who maintain that provided a child shows no obvious symptoms his nutrition must be presumed satisfactory In support of this thesis experiments are cited in which subjects who were kept on diets low in vitamin C developed no well-defined signs prior to the onset of scurvy,[5] or others in which only a small proportion of workers restricted to diets containing minimal amounts of the vitamin fell victims to scurvy [7] Even if we accepted (which we do not) the thesis that absence of scurvy means sufficient vitamin C, the saturation test would still be useful for ascertaining whether a subject was near the scurvy level or far removed from it The onset of scurvy is sudden, and it is accordingly dangerous to disregard the evidence which can be obtained of its approach A parallel with vitamin K may be drawn an individual with a prothrombin value of over 20% will appear normal on casual inspection, but when the value drops to 20% hæmorrhages will abruptly supervene Failure to take the precaution demanded by the laboratory finding is not justified

Evidence from all human and animal experience however indicates that the amount of a dietary essential needed for normal health is greater than the bare amount needed to prevent blatant deficiency disease, this is true for every vitamin where the direct test has been made Additions of extra vitamins to school-children's diets have improved physique and growth rates even when clinical appearances were previously judged to be normal The full evidence for partial deficiencies cannot be detailed here but reference may be made to recent writings (e g, Harris [13]) More specifically for vitamin C, it has recently been shown in Germany that school-children receiving supplements of synthetic ascorbic acid were less susceptible to infection and had an accelerated physical development compared with those on their ordinary war-time diets [4] † Similarly in guineapigs, much more vitamin C is needed for optimal growth, for normal tooth structure and for freedom from chance infection than is needed to protect against scurvy As with other vitamins too, the dose of ascorbic acid for best physiological performance (as indicated by growth rate in the young) is several times more than that sufficient to protect from scurvy

10 *Is saturation necessary for health ?*—It is sometimes mistakenly supposed that the test we recommend is based on the assumption that saturation is necessarily desirable No such assumption need be made The procedure which we use is to determine the extent of the deficit as number of days of dosing, and we compare it not with a standard of pre-existing saturation but with the response of subjects known to be receiving the bare reputed requirement of the vitamin If the standard for the requirement be changed, then this mode of expressing the deficit can be correspondingly scaled up or down

The amount of vitamin C needed to maintain sa tion is however not greatly in excess of the officially accepted requirement, and several good arguments can be advanced in its favour As has already been mentioned, a saturation standard is already universally accepted for other dietary essentials, such as iron, calcium and phosphate Moreover as Bigwood [3] has cogently pointed out, in animals such as rats, for whom nature has provided a synthesis of vitamin C in the organism, saturation is the rule The same is true, in their native habitat, of guineapigs, which resemble man and monkeys in being unable to synthesise the vitamin. The question of the desirability or otherwise of saturation as such can however be left open without affecting the validity of the saturation test

11 *Vitamin C not stored in the organism* —Becaus large stores of vitamin C cannot be laid down for futu use, in contrast for example with vitamin A, the significance of any test to determine reserves has been questioned Whether the term preferred be "degree saturation" or "reserves" (perhaps less appropriate it undoubtedly remains true that the test enables decision to be reached as to whether the subject's statu is near that of scurvy or corresponds with an adequat past intake (equal to that of the League of Nation standard or any other chosen standard), or if intermediat to fix its position

12 *Possibility of adaptation to deficiency or excess*— It has been written "if a standard dose of alcohol wer given to a chronic alcoholic and a total abstainer, th former would probably excrete little, whereas the latte would appear to be 'saturated' as judged by the urinar excretion" [21] Even if this were true, the objection is theoretical one and it has to be pointed out once more that, in practice, control subjects are found to respond in proportion to their past intake, and thus by the only valid criterion the test works

SUMMARY

The reliability of the saturation method is considere in relation to the following points specificity, standard taken to represent saturation, fluctuations in excretion after saturation, variations between individuals, influence of fever or other factors increasing the requirement, relation to blood level, variation in requirement in relation to body-weight, standards accepted for daily requirement; reality of subclinical deficiency, significance of saturation for health, lack of "reserves" o vitamin C, possibility of adaptation

It is concluded that the method is reliable

In large-scale control tests responses have been graded in proportion to the past intake

REFERENCES

1 Abbasy, M A, Harris, L J and Ellman, P (1937) *Lancet*, ii, 181
2 Archer, H E and Graham, G (1936) *Ibid* i, 710, ii, 364
3 Bigwood, E F (1941) at a meeting of the *Nutrit Soc* on Oct 18, 1,
4 *Bull War Med* (1941) 2, 5
5 Crandon J H, Lund, C C and Dill, D B (1940) *New Engl J Med* 223, 353
6 Daum, K, Boyd, K and Paul, W D (1939) *Proc Soc exp Biol, N Y* 40, 129
7 Fox F W, Dangerfield, L F, Gottlieb, S F and Jokl, E (1940) *Brit med J* ii, 143
8 Francis, G E C and Wormall, A (1942) *Lancet*, i, 647 (following paper)
9 Gander, J and Niederberger, W (1936) *Münch med Wschr* 34, 1386
10 Göthlin, G F, Frisell, E and Rundquist, N (1937) *Acta med scand* 92, 1
11 Guggenheim, K (1939) *J Hyg, Camb* 39, 35
12 Harris, L J (1940) *Lancet*, ii, 259
13 — (1941) at a meeting of the *Nutrit Soc* on Oct 18, 1,
14 — Passmore, R and Pagel, W (1937) *Lancet*, ii, 183
15 Harrison, R J, Mourrant, A E and Wormall, A (1939) *St Bart's Hosp J* 46, 224
16 Hawley, E E, Frazer, J P, Button, L L and Stephens, D J (1936) *J Nutrit* 12, 215
17 League of Nations (1938) *Bull Hlth Org L o N* 7, 470
18 Neuweiler, W (1935) *Klin Wschr* 14, 1793
19 Scheunert, A (1940) *Dtsch med Wschr* 66, 365
20 Schultzer, P (1936) *Acta med scand* 88, 317
21 Sinclair, H M (1941) *Food*, 10, 299
22 Smith, S L (1938) *J Amer med Ass* 111 1753
23 United States National Research Council (1941) *Ibid* 116, 2601
24 Widenbauer F (1937) *Klin Wschr* 16, 600
25 Wood, P (1935) *Lancet* 2, 1405
26 Zilva, S S (1941) *Biochem J* 35, 1240

---

† In comparable tests in the British Isles or America, the addition of extra vitamin C to "normal" diets has resulted in a diminished morbidity from infectious disease (e g, duration of tonsillitis, and incidence of rheumatic fever and pneumonia Glazebrook, A J, and Thomson, S *J Hyg Camb* 1942, 42, 1), less gingivitis (Roff, F S and Glazebrook, A J *J R nav med Serv* 1939, 25, 340) and improved healing after surgical operations (Lund, C C and Crandon, J H *Ann Surg* 1941, 114, 776) or dental extractions (Campbell H G and Cook, R P *Brit dent J* 1942, 72, 6)

VITAMIN-C SURVEY OF MEDICAL STUDENTS

GORDON E C FRANCIS
B SC LOND
DEMONSTRATOR IN BIOCHEMISTRY AT THE MEDICAL COLLEGE OF ST BARTHOLOMEW'S HOSPITAL, LONDON

ARTHUR WORMALL
D SC LEEDS
PROFESSOR OF BIOCHEMISTRY IN THE UNIVERSITY OF LONDON AT THE COLLEGE

SHORTLY before the outbreak of war we started a vitamin survey of the students of St Bartholomew's Hospital Medical College. the intention being to utilise some of the chemical and physical methods which had then become available for assessing the level of nutrition f large groups of the population It was hoped in this nvestigation to make surveys with respect to vitamins A, B, and C, and nicotinic acid, but owing to various circumstances only the vitamin-C survey has been undertaken up to the present

In the late spring of 1939, determinations of the resting excretions of vitamin C and the response to large doses of he vitamin were carried out on 87 medical students Harrison Mourant and Wormall 1939), it was found that 48 of these subjects (i.e about 55%) excreted more than 50 mg of vitamin C in the afternoon two-hour period following the administration of a dose of 700 mg per 10 stone body-weight Of the 39 unsaturated subjects who required two or more doses to excrete 50 mg, 10 were tested further; 6 of these gave good excretion after a second dose 2 required three doses 1 four and 1 five. It was concluded that among these students there was a certain amount of unsaturation with regard to vitamin C, but no evidence of a serious deficiency of the vitamin was obtained except perhaps in one case No relationship was found between the degree of saturation with vitamin C and ability to pass examinations, nor were those who lived in lodgings less saturated with the vitamin than those who lived at home

The outbreak of war interfered with this survey, but it has been possible to continue part of the investigation. In July and September 1940, and during June and July, 1941, further vitamin-C saturation tests have been made on groups selected at random from our students, and the results are given below

DETAILS OF THE TESTS

Saturation tests were carried out by the method described by Harris and Abbasy (1937)

A dose of ascorbic acid (BDH), equal to 70 mg per stone of body weight (with no subtraction for clothing), was given at 9 A.M., and the urine was collected between 1 and 3 P.M. (i.e., the bladder was emptied at 1 P.M. and again at 3 P.M., the latter sample being collected and its volume measured) Each specimen of urine was acidified with 1/9th of its volume of glacial acetic acid, and the vitamin determination was made at once by the 2, 6 dichlorophenolindophenol method Those who excreted during this two hour period less than 50 mg per 10 stone of body-weight received a second dose, and if necessary further doses on subsequent days, Saturdays and Sundays being excluded

TABLE I—SATURATION TESTS JULY (A) AND SEPTEMBER (B) 1940

	Subject	Wt (lb)	Vit C (mg) excreted after 1st dose	2nd dose	3rd dose	4th dose	Subject	Wt (lb)	Vit C (mg) excreted after 1st dose	Subject	Wt (lb)	Vit C (mg) excreted after 1st dose
A	1	145	3 5	16	42	95	9	176	117	19	154	91
	2	132	6 2	43	82		10	140	75	20	157	81
	3	151	16	89			11	145	159	21	133	65
	4	139	4 9	96			12	145	107	22	130	131
	5	145	11	63			13	168	66	23	152	98
	6	173	10	70			14	144	54	24	172	82
	7	149	3 6	67			15	149	91	25	166	71
	8	192	36	64			16	170	134	26	118	76
							17	165	75	27	140	85
							18	232	199	28	200	227
										29	191	94
B	30	163	8 3	42	120		36	171	80	42	163	138
	31	135	5	28	53		37	158	50			
	32	[illegible]	26	106			38	159	76			
	33	145	17	103			39	158	50			
	34	154	46	74			40	147	120			
	35	154	37	98			41	137	56			

Determinations of the resting excretions of vitamin C were not made in the investigations reported here since these values are more difficult to determine with a group of individuals who are carrying out their normal duties Furthermore as Harris and his colleagues have stated (Harris and Ray 1935) the most satisfactory information about the degree of saturation of a subject with vitamin C is obtained by observing the response to repeated large test doses of the vitamin the resting level may, however, furnish a rough but useful guide (Harris 1940)

TABLE II—SATURATION TESTS, JUNE AND JULY, 1941

Subject	Wt (lb)	Vit C (mg) excreted after 1st dose	2nd dose	3rd dose	4th dose	5th dose	Subject	Wt (lb)	Vit C (mg) excreted after 1st dose	2nd dose	3rd dose	4th dose
43	148	3 7	3 6	3 3	1 1	5 4*	54	158	2 2	11 5	45	135
44	137	2 5	2 7	4 4	34	97	55	138	1 2	1 7	43	58
45	144	1 7	2 1	10 7	33	72	56	136	2 7	2 4	9 2	82
46	167	3 4	4 1	1 6	41	121	57	163	3 9	3 6	3 7	66
47	140	2 7	2 7	19	38	151	58	162	3 1	2 7	24	170
48	150	2 3	2 4	11	44	91	59	151	3 5	3	20	60
49	147	2 3	3 8	3 1	17 3	82	60	146	3 1	2 9	4 1	81
50	156	2 8	4 3	7 5	48	135	61	148	2	2 3	3 3	77
51	172	2 4	2 7	2 1	29	72	62	153	3	4 4	34	75
52	155	2 4	2 1	2 4	12 8	72	63	170	3 8	4 6	36	69
53	199	3	4 2	11 2	66	100						

Subject	Wt (lb)	Vit C (mg) excreted after 1st dose	2nd dose	3rd dose	Subject	Wt (lb)	Vit C (mg) excreted after 1st dose	2nd dose	Subject	Wt (lb)	Vit C (mg) excreted after 1st dose
64	127	3 6	0 4	49	78	164	29	222	91	196	69
65	140	1 3	2	55	79	154	12 4	94	92	137	120
66	158	0 5	36	55	80	133	10 2	50	93	162	89
67	150	2 4	24	122	81	159	6 6	84	94	161	61
68	154	2 6	16	93	82	158	16 5	127			
69	146	2 6	35	118	83	140	8 3	54			
70	140	2 3	27	77	84	194	37	104			
71	138	2 9	5	125	85	157	3 5	93			
72	162	3 1	20	91	86	146	20	90			
73	198	3 9	37	106	87	180	18 4	140			
74	202	2 8	19	90	88	124	3 2	74			
75	133	2 8	24	67	89	140	46	147			
76	186	4 4	5 1	120	90	132	33	125			
77	142	9 1	26	96							

* Excretion of vitamin C after 6th dose, 14 3 mg and after 7th dose, 88 mg

TABLE III—SUMMARY OF TABLES I AND II

Period	No of subjects	Subjects requiring 2 or more doses	3	4	5	6	7
July 1940	29	8 (28%)	2 (7%)	1 (3%)	0		
Sept, 1940	13	6 (46%)	2 (15%)	0			
June–July 1941	52	48 (92%)	35 (67%)	21 (40%)	11 (21%)	1	1

The specificity of the titration method with 2, 6-dichlorophenolindophenol has been much discussed As Harris and his colleagues, and other workers have often stated, the values obtained by this method are admittedly high owing to the presence in urine of substances other than ascorbic acid which will reduce the dyestuff but the error involved is very small in the case of the saturation tests Even if it is assumed that the excretion of non-vitamin reducing substances may at times be as high as the equivalent of 20–25 mg of the vitamin per day, this would only correspond to 1–3 mg during the two-hour period of urine collection The chief virtues of the saturation test (with titration of the urine by the indophenol method) are its simplicity and the clear-cut results with the majority of subjects Taking the value of 50 mg as the minimum vitamin-C excretion during the afternoon period indicating saturation," it is found that most subjects are either definitely saturated or definitely unsaturated; of the tests recorded in tables I and II, less than 5% showed excretions between 40 and 50 mg of ascorbic acid When the volume of urine excreted is neither extremely high nor extremely low the question of whether the subject is saturated or not can in most cases be answered by recording whether a micro- or a macro-burette was needed for the titration For the above-mentioned reasons, it does not appear necessary to use in surveys of this type the more complicated methods which have been suggested for the determination of vitamin C in urine—e g , those of Scarborough and Stewart (1937), Roe and Hall (1939), Meiklejohn and Stewart (1941)

DISCUSSION

The results of the saturation tests carried out in July and September, 1940, are given in table I, those for June and July, 1941, in table II, and the data from both tables are summarised in tables III and IV The results obtained in 1940 were generally similar to those obtained 12 months earlier and it did not appear at that stage (9 months after the outbreak of war) that there had been any significant alteration in the degree of vitamin-C saturation of the subjects tested In the late spring and early summer of 1941, however, the position appeared to be quite different In 1940, only 4 out of 42 subjects (9 5%) required more than two doses of the vitamin to effect saturation, whereas in 1941, 35 out of 52 (67%) required more than two doses Even if the results for September, 1940, are excluded, the comparison between 1940 and 1941 leaves no doubt that the subjects were much less saturated with vitamin C in 1941 than were similar subjects 12 months before On an average, the subjects were two large doses (equivalent to about 1 5 g of vitamin C) worse off in 1941 than in 1940, and a difference of this order was almost invariably observed when the same subjects, students and members of the staff, were tested over the period May, 1939, to July, 1941 The deficiency in 1941 can, of course, be attributed largely to the great shortage of oranges, lemons and similar fruits during the winter of 1940–41

TABLE IV—NUMBER OF DOSES OF VITAMIN C REQUIRED TO GIVE SATURATION

Period	No of subjects	No of doses required to give "saturation"							Av no doses needed per subject
		1	2	3	4	5	6	7	
May–July, 1939	10*		6	2	1	1			–
July, 1940	29	21	6	1	1				1 4
Sept , 1940	13	7	4	2					1 6
June–July, 1941	52	4	13	14	10	10	0	1	3 25

* A group of the most unsaturated of 87 subjects

The question whether it is necessary to aim at a state of saturation with vitamin C does not appear to arise in investigations of this type, where the main object is to compare the levels of vitamin-C nutrition of various groups of the population, or to compare the results obtained with the same group, or similar groups, at two or more different periods It does seem reasonable to conclude, however, that in 1941 the subjects studied in this investigation were considerably nearer to a state of "sub-scurvy" than they were 12 months previously, and indeed some of these "normal" individuals required about as much vitamin C to attain saturation as did some of the patients with gastric and duodenal ulcer suffering from sub-scurvy as a result of restricted diets (cf Archer and Graham 1936) It is not suggested that the subjects studied in this investigation were in fact near the sub-scurvy condition, but until it can be shown that a partial deficiency of the vitamin is of no serious import it seems desirable that special efforts should be made to ensure a more satisfactory supply of vitamin C in the daily diet It may well be that the normal metabolic processes of the body can be maintained satisfactorily at vitamin-C levels in the blood and tissues well below saturation point, but there is much to be said in favour of the view that an appreciable reduction of the vitamin-C "bank balance," or the acquirement of a serious "overdraft," is to be deplored Perhaps more attention will be paid to the importance of an adequate dietary supply of the vitamin as a result of the recent revival of interest in the relationship between vitamin-C deficiency and wound healing (cf Hartzell, Winfield and Irvin 1941, Lund and Crandon 1941, Hunt 1941, who review the earlier work on this subject)

SUMMARY

A vitamin-C survey by means of saturation tests has been carried out on groups of medical students during the past 2½ years , 87 subjects were examined between May and July, 1939, 42 in July and September, 1940, and 52 in June and July, 1941 The results suggest that, as far as "saturation" with the vitamin is concerned, the condition of these subjects after the first 9 months of war was not significantly different from that of a similar group 12 months earlier In June and July, 1941 (about 21 months after the outbreak of war), however, the subjects showed a much greater degree of unsaturation, and this deficiency was on an average about 1¼ large doses per subject (equivalent to about 1 5 g of the vitamin)

We wish to thank Dr L J Harris for his advice, and Messrs British Drug Houses for a supply of ascorbic acid

REFERENCES

Archer, H E and Graham, G (1936) *Lancet*, ii, 364
Harris, L J (1940) *Ibid*, ii, 259
— and Abbasy, M A (1937) *Ibid*, ii, 1429
— and Ray, S N (1935) *Ibid*, i 71
Harrison, R J , Mourant, A E and Wormall, A (1939) *St Bart's Hosp J* 46, 224
Hartzell, J B , Winfield, J M and Irvin, J L (1941) *J Amer med Ass* 116, 669
Hunt, A H (1941) *Brit J Surg* 28, 436
Lund, C C and Crandon, J H (1941) *J Amer med Ass* 116, 663
Meiklejohn, G T and Stewart, C P (1941) *Biochem J* 35, 761
Roe, J H and Hall, J M (1939) *J biol Chem* 128, 329
Scarborough, H and Stewart, C P (1937) *Biochem J* 32, 2232

CAPILLARY FRAGILITY IN PEACE AND WAR

A STATISTICAL COMPARISON

H N MUNRO
M B , B SC GLASG

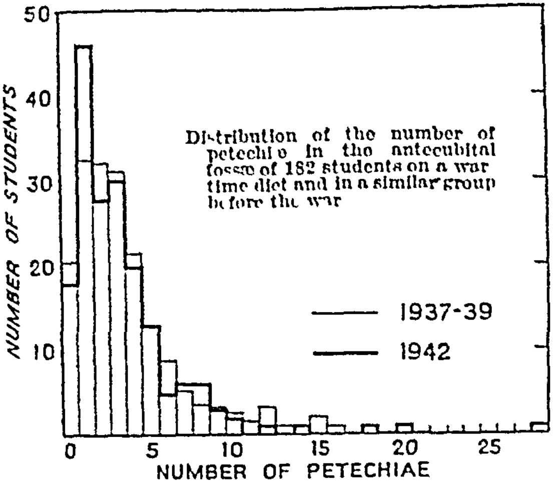
SAMUEL LAZARUS
M D GLASG , M R C P , F R F P S

G H BELL, M B , B SC GLASG

(*Institute of Physiology, University of Glasgow*)

THE estimation of capillary fragility has been widely used and regarded as an index of vitamin-C intake, especially by Gothlin (1931 and 1937), but the relationship between capillary fragility and dietary vitamin C has not yet been clearly established In our first investigation (Bell, Lazarus and Munro 1940) we found that healthy people with increased capillary fragility usually showed a reduction in the petechial counts after a course of vitamin C , we were forced to conclude, however, that the count obtained in Gothlin's test depended on many factors, some known and some not It was not possible to assess the relative importance of the various factors , we produced good evidence that the count depended on the skin area chosen—even corresponding areas on the two arms of one subject often gave readings which differed appreciably It seems, therefore, reasonable to suppose that there are individual variations affecting this test in the skin of any one area This is but one of the difficulties in this test which makes us uncertain how much the effects of lack of vitamin C on the capillaries may be obscured by other factors Hess (1920) noted in his monograph that even in cases of scurvy the capillary fragility was not uniformly increased One of us (S L) has observed two cases of scurvy where the capillary fragility was within the normal range , the same thing has been reported by Fox, Dangerfield, Gottlich and Jokl (1940) using a negative-pressure method Further, these workers did not find a single positive reading either in a control group of native miners on a diet low in vitamin C or in a test group who were given additional vitamin C In the case of induced scurvy (Crandon, Lund and Dill 1940) the Gothlin test was negative even in the presence of frank scurvy

Our first investigation was carried out between 1937 and 1939 on 346 normal healthy students by means of Gothlin's test We thought the repetition of the investigation under war conditions on a large group resembling as nearly as possible the first group in age and home conditions might shed some light on the problem , comparison of large groups might allow us to discount to a certain extent individual variations The tests were accordingly carried out on our second-year students between Jan 26 and Feb 26, 1942 This was long after the presumably high C intake of the summer months and precedes the spring augmentation of the diet The



Distribution of the number of petechiæ in the antecubital fossæ of 182 students on a war time diet and in a similar group before the war

consumption of foods rich in vitamin C was certainly very much lower than at the time of the first investigation when we were able to classify the subjects of the test according to the amount of citrous fruit they ate Of the 182 students of the present experiment 14 had been taking vitamin C in tablets or capsules more or less regularly before the test, 1 had seven oranges in the previous fortnight, 20 said that they had eaten about one orange a week during the winter, the remainder (about 81%) took raw fruit either not at all or only very rarely Cooked vegetables must have constituted the chief source of C in nearly all cases

Results—The tests were carried out exactly as described in the previous communication, with the same apparatus and light source, and the readings were made by the same three observers The average of the petechial counts on both arms was recorded because we found in 1937–39 that this gave a smaller scatter The histograms (see figure) show in a striking manner how nearly alike the results of the two investigations are, the 1937–39 results (thin lines) have been reduced by 182/346 to facilitate comparison The statistical analysis of the data and the comparison of the two investigations are summarised in the table We had expected that the incidence of persons with high capillary fragility (a count of 8 or more) would be the most sensitive index of the state of nutrition in regard to vitamin C, actually the figures do nothing more than confirm the similarity of the two groups

DISCUSSION

In spite of the alteration in diet the results of the present investigation resemble very closely those obtained before the war Widdowson and Alington (1941), in a survey of middle-class diets, found that the vitamin-C content had been reduced on the average from 57 mg per day in 1935 to 27 mg per day in 1941 Taking into account the present methods of distribution and rationing of foods there is no good reason to suppose that the average values in our subjects would be very different

FINDINGS IN THE TWO INVESTIGATIONS

—	1937–39	1942	Difference	Standard error
No of students	346	182		
Average age (yr)	20	20		
Percentage of males	84 7	72 5	12 2	3 8
Mean no of petechiæ	3 50	3 13	0 37	0 32
Standard deviation of above	3 31	3 51		
Percentage with 8 or more petechiæ in whole group	10 7	8 8	1 9	2 68
Percentage living in lodgings	13 3	16 5	3 2	3 3
Percentage of those in lodgings with 8 or more petechiæ	15 2	6 45		
Percentage of those living at home with 8 or more petechiæ	7 7	9 34		
Standard error of differences of last two figures	5 5	5		

It is not easy to explain the similarity of the results in spite of the difference in diet There are at least three possibilities It may be that the present intake of vitamin C though reduced is adequate It may be that vitamin C acquired in the summer has tided our students over the winter, it is being increasingly appreciated that it is possible to maintain normal nutrition when the intake of protective substances is erratic (see Zilva 1942), even on a vitamin-C free diet Crandon showed no signs of scurvy till after five months A third possibility is that relationship between vitamin C and capillary fragility is not a close one and that the test is therefore insensitive in this respect Our present information is insufficient to allow us to choose between these alternatives

SUMMARY

The capillary fragility of 182 normal healthy students on a war-time diet was compared with that of a similar group on a prewar diet, there was no significant difference.

REFERENCES

Bell, G H Lazarus S and Munro H N (1940) *Lancet*, ii 155
Crandon J H Lund C C and Dill, D B (1940) *New Engl J Med* 223, 353 (Quoted by Fox, F W *Brit med J* 1941, i, 311)
Fox F W, Dangerfield, L F, Gottlieb, S F and Jokl, E (1940) *Brit med J* ii, 143
Göthlin G F (1931) *Skand Arch Physiol* 61, 225, (1937) *Lancet*, ii, 703
Hess A F (1920) Scurvy Past and Present, Philadelphia
Widdowson, E M and Alington B K (1941) *Lancet*, ii, 361
Zilva, S S (1942) *Biochem J* 35, 1240

INCIDENCE OF MOTTLED TEETH

LEO SPIRA, M D VIENNA AND PRAGUE, M R C S
CAPTAIN R A M C

IN the present state of our knowledge the earliest visible sign of chronic fluorine poisoning (fluorosis) is a hypoplasia of the teeth, described variously as "mottled enamel," "darmous," "denti di Chiaie," or by the recently adopted term "chronic dental fluorosis" It is convenient to adopt this readily verifiable sign as a starting-point for investigating the extent to which the condition is present in this country

The lesion (referred to in this paper as mottled teeth) is said—though I have found no documentary evidence—to have been first brought to the notice of the dental profession by Stefano Chiaie It was mentioned by Eager (1901) under the name of "denti di Chiaie" as being endemic in certain parts of Naples, and was later studied by McKay Black and McKay described it more fully in 1916, after which cases were reported from many countries Popular belief connected the mottling of the teeth with the drinking water, and McKay (1918) proved that drinking water was, in fact, the source of contamination though without identifying the agent In 1931 Smith and her colleagues established, by animal experiment, that fluorine in drinking water was the ætiological factor

APPEARANCE OF THE TEETH

The labial surface of the anterior maxillary teeth is usually most affected, showing opaque paper-white patches, varying in size and shape, and horizontal bands of varying width Sometimes the whole surface loses its normal glossy translucency, and assumes a dull chalky-white appearance When not paper-white, the teeth are usually, but not invariably, stained brown or yellow, occasionally black As the condition progresses, pits appear, and the incisive edges often show attrition The severity of the lesion increases as the fluorine content of the water rises, and with the length of time of fluorine ingestion The dental dystrophy has been graded according to Dean (1934) as follows F1 = normal F2 = doubtful F3 = very light F4 = light F5 = moderate (mottled) F6 = moderate (stained brown) F7 = somewhat serious F8 = serious

The threshold value of fluorine in water for the production of the dental dystrophy is generally accepted as being one part per million (1 p p m), equivalent to gr 1/120 of fluorine to a pint of water In this country Ainsworth (1933) found cases of fluorosis among schoolchildren in Maldon, Essex, and traced them all to drink-macro-burette was needed for the titration For the above-mentioned reasons, it does not appear necessary to use in surveys of this type the more complicated methods which have been suggested for the determination of vitamin C in urine—e g , those of Scarborough and Stewart (1937), Roe and Hall (1939), Meiklejohn and Stewart (1941)

DISCUSSION

The results of the saturation tests carried out in July and September, 1940, are given in table I, those for June and July, 1941, in table II, and the data from both tables are summarised in tables III and IV The results obtained in 1940 were generally similar to those obtained 12 months earlier and it did not appear at that stage (9 months after the outbreak of war) that there had been any significant alteration in the degree of vitamin-C saturation of the subjects tested In the late spring and early summer of 1941, however, the position appeared to be quite different In 1940, only 4 out of 42 subjects (9 5%) required more than two doses of the vitamin to effect saturation, whereas in 1941, 35 out of 52 (67%) required more than two doses Even if the results for September, 1940, are excluded, the comparison between 1940 and 1941 leaves no doubt that the subjects were much less saturated with vitamin C in 1941 than were similar subjects 12 months before On an average, the subjects were two large doses (equivalent to about 1 5 g of vitamin C) worse off in 1941 than in 1940, and a difference of this order was almost invariably observed when the same subjects, students and members of the staff, were tested over the period May, 1939, to July, 1941 The deficiency in 1941 can, of course, be attributed largely to the great shortage of oranges, lemons and similar fruits during the winter of 1940–41

TABLE IV—NUMBER OF DOSES OF VITAMIN C REQUIRED TO GIVE SATURATION

Period	No of subjects	No of doses required to give "saturation"							Av no doses needed per subject
		1	2	3	4	5	6	7	
May–July, 1939	10*		6	2	1	1			-
July, 1940	29	21	6	1	1				1 4
Sept , 1940	13	7	4	2					1 6
June–July, 1941	52	4	13	14	10	10	0	1	3 25

* A group of the most unsaturated of 87 subjects

The question whether it is necessary to aim at a state of saturation with vitamin C does not appear to arise in investigations of this type, where the main object is to compare the levels of vitamin-C nutrition of various groups of the population, or to compare the results obtained with the same group, or similar groups, at two or more different periods It does seem reasonable to conclude, however, that in 1941 the subjects studied in this investigation were considerably nearer to a state of "sub-scurvy" than they were 12 months previously, and indeed some of these "normal" individuals required about as much vitamin C to attain saturation as did some of the patients with gastric and duodenal ulcer suffering from sub-scurvy as a result of restricted diets (cf Archer and Graham 1936) It is not suggested that the subjects studied in this investigation were in fact near the sub-scurvy condition, but until it can be shown that a partial deficiency of the vitamin is of no serious import it seems desirable that special efforts should be made to ensure a more satisfactory supply of vitamin C in the daily diet It may well be that the normal metabolic processes of the body can be maintained satisfactorily at vitamin-C levels in the blood and tissues well below saturation point, but there is much to be said in favour of the view that an appreciable reduction of the vitamin-C "bank balance," or the acquirement of a serious "overdraft," is to be deplored Perhaps more attention will be paid to the importance of an adequate dietary supply of the vitamin as a result of the recent revival of interest in the relationship between vitamin-C deficiency and wound healing (cf Hartzell, Winfield and Irvin 1941, Lund and Crandon 1941, Hunt 1941, who review the earlier work on this subject)

SUMMARY

A vitamin-C survey by means of saturation tests been carried out on groups of medical students past 2½ years ; 87 subjects were examined between and July, 1939, 42 in July and September, 1940, and in June and July, 1941 The results suggest as far as "saturation" with the vitamin is concerned, the condition of these subjects after the first 9 of war was not significantly different from that of similar group 12 months earlier In June and July, (about 21 months after the outbreak of war), however, the subjects showed a much greater degree of unsaturation, and this deficiency was on an average about 1¾ large doses per subject (equivalent to about 1 5 g of the vitamin)

We wish to thank Dr L J Harris for his advice, and Messrs. British Drug Houses for a supply of ascorbic acid

REFERENCES

Archer, H E and Graham, G (1936) *Lancet*, ii, 364
Harris, L J (1940) *Ibid*, ii, 259
— and Abbasy, M A (1937) *Ibid*, ii, 1429
— and Ray, S N (1935) *Ibid*, i, 71
Harrison, R J , Mourant, A E and Wormall, A (1939) *St Bart's Hosp J* 46 224
Hartzell, J B , Winfield, J M and Irvin, J L (1941) *J Amer med Ass* 116, 669
Hunt, A H (1941) *Brit J Surg* 28, 436
Lund, C C and Crandon, J H (1941) *J Amer med Ass* 116, 663
Meiklejohn, G T and Stewart, C P (1941) *Biochem J* 35, 761
Roe, J H and Hall, J M (1939) *J biol Chem* 128, 329
Scarborough, H and Stewart, C P (1937) *Biochem J* 32, 2232

CAPILLARY FRAGILITY IN PEACE AND WAR

A STATISTICAL COMPARISON

H N Munro M B , B SC GLASG
Samuel Lazarus M D GLASG , M R C P , F R F P S
G H Bell, M B , B SC GLASG
(*Institute of Physiology, University of Glasgow*)

THE estimation of capillary fragility has been widely used and regarded as an index of vitamin-C intake, especially by Gothlin (1931 and 1937), but the relationship between capillary fragility and dietary vitamin C has not yet been clearly established In our first investigation (Bell, Lazarus and Munro 1940) we found that healthy people with increased capillary fragility usually showed a reduction in the petechial counts after a course of vitamin C , we were forced to conclude, however, that the count obtained in Gothlin's test depended on many factors, some known and some not It was not possible to assess the relative importance of the various factors , we produced good evidence that the count depended on the skin area chosen—even corresponding areas on the two arms of one subject often gave readings which differed appreciably It seems, therefore, reasonable to suppose that there are individual variations affecting this test in the skin of any one area This is but one of the difficulties in this test which makes us uncertain how much the effects of lack of vitamin C on the capillaries may be obscured by other factors Hess (1920) noted in his monograph that even in cases of scurvy the capillary fragility was not uniformly increased One of us (S L) has observed two cases of scurvy where the capillary fragility was within the normal range , the same thing has been reported by Fox, Dangerfield, Gottlich and Jokl (1940) using a negative-pressure method Further, these workers did not find a single positive reading either in a control group of native miners on a diet low in vitamin C or in a test group who were given additional vitamin C In the case of induced scurvy (Crandon, Lund and Dill 1940) the Gothlin test was negative even in the presence of frank scurvy

Our first investigation was carried out between 1937 and 1939 on 346 normal healthy students by means of Gothlin's test We thought the repetition of the investigation under war conditions on a large group resembling as nearly as possible the first group in age and home conditions might shed some light on the problem , comparison of large groups might allow us to discount to a certain extent individual variations The tests were accordingly carried out on our second-year students between Jan 26 and Feb 26, 1942 This was long after the presumably high C intake of the summer months and precedes the spring augmentation of the diet The

Medical Societies

ROYAL SOCIETY OF MEDICINE

AT a meeting of the section of Obstetrics and Gynæcology on May 15, with Prof J M MUNRO KERR in the chair, a discussion on

Maternity Services

was opened by Dame LOUISE McILROY Starting from the periphery she said that the patient must be allowed to choose her doctor The service must cover obstetricians and gynæcologists, and it must be decided whether maternity hospitals as such are to be preferred to maternity departments in general hospitals Maternity departments are more economical, and have all necessary ancillary services available The maternity service is necessarily linked with the medical service of the country as a whole, and with the social services Lowering of the incidence of disease would help to reduce the neonatal mortality She would like to see maternity taken away from child welfare It is a mistake, she considers, to place antenatal supervision of the mother in the hands of those who never deliver a case If something goes wrong during labour the midwife has to call in a doctor who has not done the antenatal work, and this leads to mutual criticism If no hospital is available the doctor may have to work in a bad light, with few facilities , and if a consultant is needed the patient must bear the expense The doctor bears the brunt of failure in a bad case In some areas the maternity services are so well organised as to be nearly perfect , in others they are not The voluntary organisations must be given a place in any new scheme At present, she felt there is lack of coordination with waste and overlapping In London, for example, the hospitals are run by the London County Council and the midwives and clinics come under the boroughs The lowering of the maternal death-rate must not be taken as the sole measure of the success of our services stillbirths and the neonatal death-rate are still high In some areas maternity beds and convalescent homes are scarce Growing numbers of mothers are finding it cheaper and less worrying to have their children in hospital instead of at home, but in some reception areas the influx of pregnant mothers has left the local residents short of hospital accommodation We must aim at retaining the good features of existing schemes At present the best atmosphere and the greatest incentives to do good work are found, she considers, in the voluntary hospitals , whereas the best equipment is often in the LCC hospitals In any whole-time service, she thinks, there are many who work well but more who watch the clock , and those who get on are the administrators The general practitioner must have his place in any new scheme and should be chosen not merely for willingness but for qualifications and experience Practitioners should form rotas, and should be able to send their patients into local maternity homes to which consultants would be attached The patient should be able to choose her doctor from a team and he would see her through pregnancy and labour to the end of the first month of the child's life In any official service full records must be kept, and many patients give confidential information to their obstetrician For this reason as well as others the government of the service should be in the hands of the medical profession and not primarily in those of a lay board In Lanarkshire and one or two other parts of Scotland the general practitioners look after maternity patients and have a central hospital staffed with consultants to which they can send patients Less work is done by the midwives there than in England In Russia whole-time doctors and midwives are provided with equipment and with accommodation for their patients at polyclinics and hospitals, work fixed hours with regular holidays, and take postgraduate courses every three years There is much to recommend it, but it lacks the incentive of competition She felt that obstetricians must judge for themselves what is best , and suggested that local medical committees should be larger, and that a central advisory committee should be appointed to consult directly with the government She favoured a regional plan, under the Ministry of Health

Mr L EARDLEY HOLLAND felt that the trend of maternal mortality can be taken as a yard-stick, albeit a rough one, of the success of our maternity service During the last five years there has been a considerable fall both in the deaths from sepsis (a 60% drop) and in those from other causes (a 10% drop) This is the result, he considers, of long-standing efforts by the government, the local authorities, the Central Midwives Board and the teachers of midwifery , and he believes that the rate can be made to fall still further—to half the present figure or less Midwifery, he said, is best taught in large maternity departments in hospitals of university standing In Great Britain the medical school with the greatest number of maternity beds was in Glasgow then came Edinburgh Leeds Manchester Belfast, Newcastle the British Postgraduate Medical School, Sheffield, and then the London teaching hospitals in a descending scale to the Middlesex which has only 12 maternity beds in the hospital itself, though it has maternity beds elsewhere He was considering only the teaching units in the medical schools, and not taking account of Queen Charlotte's Hospital in which 200 beds are to be available after the war The training of midwives suffers from the very small units (often with only 5–10 beds) in which many of them are taught In 1939 he had investigated the causes of 60 maternal deaths in a county which had a maternal mortality of only 1 8 per 1000 he found that 25 (12%) died from shock and collapse, 11 from sepsis 6 from toxæmia, 7 from pulmonary embolism, 7 after cæsarean section and 1 from associated conditions Institutional delivery is safer than domiciliary, he considers because the means to give transfusions and other urgent treatment are at hand , and more deaths occur from lack of judgment and technical skill during labour than from lack of antenatal care In the county referred to there were 5500 births in 1940–41, with only 6 maternal deaths (mortality 0 91 per 1000) Emergency cases were delivered in improvised homes These good figures, he said, demonstrate the safety of institutional midwifery and reflect credit on the general practitioners who responded to the medical-aid call, and on the midwives He quoted figures supplied by Dr Allen Daley showing that in London in 1938 of 66 318 deliveries 15 561 were in institutions , *the maternal mortality of the booked cases was* 0 87 per 1000 It is a defect of the present service that there are 308 independent local authorities in the country with which Whitehall had to deal The service thus lacks form , the units are too small, and in some the quality of the work is poor Since the beginning of the war there has been a lamentable separation, he feels, between Whitehall and the obstetric teachers—between the official and practising obstetricians He wished to see an ad-hoc national maternity board established, on which all interests would be represented He too favours regionalisation with central hospitals of university standing, equipped with at least 100 obstetric beds under the charge of an obstetrician of repute and his colleagues and students At the periphery the general practitioners and midwives would be working, with access to smaller hospitals over which the central hospital would exercise a benevolent clinical supervision Midwives, he thinks, must be given much more responsibility, with liberty to give morphia and to stitch perineums The general practitioners should still be the foundation of the obstetric service, but he finds that some of them are becoming more and some less interested in obstetrics, and this is a good thing, allowing for specialism on a small scale

Sir ALEXANDER MACGREGOR said that in Scotland the Maternity Services Act covers domiciliary midwifery but stops short at the gates of the hospital When it came to applying the act to Glasgow he had been faced with the difficulty of defining the position of the general practitioner The act was designed to prevent maternal mortality and morbidity, but he found that of the 609 general practitioners in the city only 49 notified more than 20 births a year in their practices and he did not feel he could hand over the antenatal work to them After consultation with the obstetricians he had begun, he said, to establish a whole-time maternity service with the hospital department as the focal point , but the war has interrupted this scheme, which seems appropriate to Glasgow because of the great growing popularity of the ing water containing 5 p p m of fluorine (Bowes and Murray 1936), and Wilson (1941) suggested the relation between geological distribution of fluorine and the distribution of mottled teeth, which she observed in 55 out of 378 children examined in Somerset (14 55%) The occurrence of mottled teeth has been stopped by changing to a water-supply containing less than 1 p p m (McKay 1925, 1933 and 1939, Kempf and McKay 1930, Dean, McKay and Elvove 1938, Dean and McKay 1939)

SCOPE OF INVESTIGATION

With the assistance of Captain P D Kolesar, of the Army Dental Corps, I have recently examined a large number of men and women for mottled teeth (table I) They were a fair cross-section of the population belonging to different spheres of life and engaged in varied occupations The survey was made to ascertain whether the mottled teeth were associated with any specific industrial disease Nearly 22 out of every 100 were found to have mottled teeth Of those classified as not having them, about a third of those in the older age-groups were edentulous, and some of these, no doubt, had had mottled teeth in their time Moreover, particularly among the men, the teeth were often so neglected that it was impossible to see the enamel, even with the help of a powerful lamp These, as well as all doubtful cases (which would be grouped as F2 on Dean's scale), were not classified as having mottled teeth, so that the percentage among the men examined was really considerably higher than the figure given The women were found to pay much more attention to oral hygiene than the men The conclusion to be drawn from a comparison between the sexes seems to be that the incidence in the male population is only apparently smaller, particularly since the average age of the men examined was considerably higher than that of the women The results obtained were also classified in accordance with Dean's grading (table II)

TABLE I—INCIDENCE OF MOTTLED TEETH IN 5019 PEOPLE IN VARIOUS OCCUPATIONS

—	Total	Men	Women
Number seen	5019	3338	1681
Mottled teeth	1099	722	377
Per cent	21 9	21 6	22 4

TABLE II—ANALYSIS, ACCORDING TO DEAN'S SCALE, OF THE MOTTLED TEETH FOUND IN THE SERIES

Dean's scale	Total		Men		Women	
	Cases	Per cent	Cases	Per cent	Cases	Per cent
F 3	179	16	88	12	91	24
F 4	477	43	309	43	168	45
F 5	216	20	139	19	77	20
F 6	182	17	152	21	30	8
F 7	44	4	34	4 7	10	2 6
F 8	1	0	0	0	1	0 3
Total	1099		722		377	

DISCUSSION

Mottled teeth have so far generally been accepted as an index of fluorosis only in people who, during the period of calcification of the enamel, have resided in an area with a content not less than 1 p p m of fluorine in the drinking water If this criterion holds good, it should be instructive to study the areas in which the people in the series with mottled teeth lived during the calcification of their permanent teeth This investigation proved impracticable, but it was possible to ascertain the counties in which they lived for some years before being examined, and it is reasonable to assume that, in most cases, these were the same counties as those in which they lived while their enamel was calcifying (table III) A study of the water-supplies of these localities would help to establish the sources of the endemic fluorosis Subjects examined were not drawn uniformly from all over the country, some of the counties were not represented at all and others only to a small extent, so that table III does not give a complete picture Further surveys are needed for the counties not included

TABLE III—CASES WITH MOTTLED TEETH ANALYSED ACCORDING TO THE COUNTIES IN WHICH THEY LIVED

County	Cases	Mottled teeth	Per cent	County	Cases	Mottled teeth	Per cent
England				*England*			
Herts	35	30	86	Sussex	106	17	16
Northants	20	17	85	Somerset	44	7	16
Beds	11	5	45	Shropshire	27	3	11
Derbyshire	16	6	37	Hants	151	15	10
Oxfordshire	16	6	37	Northumberland	55	5	9
Monmouth	14	5	36				
				Wales			
Leicestershire	17	6	35	Glamorgan	44	18	41
Lincolnshire	31	10	32				
Devon	82	24	29	*Scotland*			
Durham	110	32	29	Roxburgh	6	4	67
Suffolk	18	5	28	Dumfries	5	3	60
Staffs	170	47	28	Inverness	10	4	40
Middlesex	215	56	26				
Essex	194	48	25	Renfrewshire	37	9	24
Cheshire	49	12	24	Fife	44	10	23
Kent	252	58	23	Argyll	9	2	22
Bucks	62	14	23	Midlothian	64	13	20
London	977	222	23	Dumbarton	10	2	20
Gloucester	45	10	22	Morayshire	5	1	20
Yorks	562	121	22	Lanark	239	40	17
Warwick	154	33	21	Perth	18	3	17
				Berwick	6	1	17
Cumberland	14	3	21				
Dorset	36	7	19	East Lothian	7	1	14
Cornwall	26	5	19	Aberdeen	41	5	12
Lancs	196	37	19	Ayr	34	4	12
Surrey	208	39	19				
Notts	32	6	19	West Lothian	9	1	11
Worcs	33	6	18	Stirling	19	2	11
Cambridge	11	2	18	Angus	78	7	9
Wilts	29	5	17				
Berks	93	16	17				
Norfolk	35	6	17	*Northern Ireland*	18	4	22

Scattered cases were found to have come from several other counties, but their numbers were insignificant and were disregarded Wilson (1941) has already established the presence of mottled teeth in counties as widely separated as Cornwall, Somerset, Gloucester, Buckingham, Cumberland and Durham

SUMMARY

Mottled teeth, one of the first signs of chronic fluorine poisoning (fluorosis), have been found in nearly 22% of 5019 men and women examined In most cases the mottling was slight

The distribution of mottled teeth is analysed according to the counties from which those examined came Of those living in the London area 23% were affected The highest proportion was in those from Hertfordshire and Northampton (85%)

I should like to thank Captain P D Kolesar, A D C, for his help in examining cases

REFERENCES

Ainsworth, N J (1933) *Brit dent J* 55 233
Black, G V and McKay, F S (1916) *Dent Cosmos*, 58, 129, 477, 627, 781 and 894
Bowes, J H and Murray, M M (1936) *Brit dent J* 60, 556
Dean, H T (1934) *J Amer dent Ass* 21, 1421
— McKay, F S (1939) *Amer J publ Hlth*, 29, 590
— — Elvove, E (1938) *Publ Hlth Rep, Wash* 53, 1736
Eager, J M (1902) *Dent Cosmos*, 44, 300
Kempf, G A and McKay, F S (1930) *Publ Hlth Rep Wash* 45, 2923
McKay, F S (1918) *J nat dent Ass Huntington, Ind* 5, 721, (1925) *Dent Cosmos* 67, 847, (1933) *J Amer dent Ass* 20, 1137, (1939) *Ibid* 26 900
Smith, M C and Smith, H V (1935) *J Amer dent Ass* 22 814, (1940) *Amer J publ Hlth*, 30, 1050
— Lantz E M and Smith, H V (1932) *J dent Res* 12, 139, *(1935) J Amer dent Ass* 22, 817
Spira, L (1928) *Franco Brit med Rev* 5, 1 and 61, (1933) Clinical Aspect of Chronic Poisoning by Aluminium and its Alloys, London
Wilson, D C (1941) *Lancet*, i, 211 and 375

According to the Reich Health Leader (*Volkischer Beobachter*, March 27, 1942) there is no longer any danger from typhus in Germany In 1941, he says, there were in the old Reich 165 cases among Germans and 121 cases among Jews, and in the incorporated territories of Danzig West Prussia and Posen 34 cases among Germans and 2750 among Jews In February, 1942, there were 53 new cases among Germans and 56 among Jews in the old Reich and 13 among Germans and 338 among Jews in the incorporated territories In Berlin itself there were 4 new cases in February considerable and wasting is well marked The intensity of the pain varies from minor discomfort to acute pain allowing no rest In 3 cases keratodermia blenorrhagica was present, and in two others calcaneal periostitis was an obvious cause of symptoms The time relationship between the first evidence of infection and the onset of the first rheumatic symptoms was established in 40 cases In 3 they were simultaneous, in 27 the average lapse of time was a little under 2 weeks, while in the remaining 10 the average time was 4 years The knees and ankles were predominantly affected and next in frequency the fascial structures, the latter being especially resistant to treatment The sedimentation-rate was above 25 mm in the hour in the majority of cases The white-cell count varied from 7000 to 17,000, averaging 10,000 per c mm In 37 cases the average period of hospitalisation was 3 8 weeks, and of these patients 27 were discharged to duty cured, and 10, although improved, had to be invalided out of the Army Major Kersley discussed various forms of treatment and concluded that the treatment of choice is high prolonged fever mechanically induced and maintained at 106° F to 107° F for sessions of 6–10 hours In the 17 patients who received this treatment, undergoing 8-hour sessions for an average of 3 to 4 treatments, symptoms were promptly relieved, sedimentation-rates fell and the patients put on weight Only 2 cases proved resistant to treatment The results with sulphonamides were disappointing and in no way confirmed some enthusiastic reports Failing hyperthermy, protein shock by the intravenous injection of TAB vaccine proved an effective remedy and good results were also obtained by combining pelvic short-wave applications with local galvanism Some success was also obtained with ionisation using saline When the joint was very painful and swollen the anode was used as the active electrode in order to obtain its analgesic effect on nerve-endings and to employ any osmotic dispersal effect on the effusion When the condition was more chronic and there was periarticular thickening the kathode was used as a counter irritant

Lieut -Colonel A J KING discussed methods for the diagnosis and elimination of causative foci of infection His series of 61 cases included all such cases treated during a period in which the total admissions of patients for the treatment of urethritis were 2719, made up of 1784 in whom the gonococcus was found and 935 in whom the diagnosis was non-specific urethritis, giving an incidence of metastatic lesions of just over 2% The cases were grouped according to the time relationship between genital infection and metastatic lesions In 34 metastasis occurred in the course of the primary urethral infection , 4 had suffered a previous attack of arthritis with urethritis and the joint infections recurred as the result of a fresh attack or recrudescence of urethritis , and the third group consisted of 22 patients with subacute or chronic metastasis associated with chronic prostatitis occurring months or years after the original attack of urethritis The obvious diagnostic sign was urethral discharge and the gonococcus was present in 21 cases In 22 cases the gonococcus was not found This did not rule out the diagnosis of gonorrhœa but might on the other hand be evidence of poor tissue reaction against the gonococcus predisposing to metastasis In such cases repeated smears and cultures may ultimately show the gonococcus and even repeated negative tests are not conclusive, for the gonococcus may appear in the secretions later, even while the patient is under treatment, or may be found in the genital tract of an infected partner It may also be found later in cultures from the prostatic secretion In the remaining 18 cases there was no detectable discharge or other sign of urethral infection on examination during the day Smears taken before the first morning specimen of urine had been passed and inspection of this specimen usually gave the clue to the source of infection This was held to be an extremely important test in all cases of doubt. In reviewing other diagnostic signs Colonel King maintained that the presence of more than an occasional leucocyte in the prostatic secretion is evidence of chronic prostatitis, a condition which is likely to persist throughout life whatever treatment is applied The association of chronic prostatitis and subacute or chronic metastasis is very common and in such cases the prostate usually feels quite normal to the examining finger He emphasised the diagnostic importance of cultures of the prostatic secretion in subacute and chronic cases This is a specialised technique requiring a high standard of care in the preparation of a reinforced medium and in the use of a differential stain for isolation of the gonococcal colonies The complement-fixation test for gonorrhœa gives valuable results in expert hands but few have mastered the technique The difficulty lies in the preparation of a reliable antigen In 90% of cases of acute gonococcal arthritis a positive result may be expected but the percentage is much smaller in more chronic cases and in the connective-tissue infections In reviewing methods of treatment Colonel King laid stress on the value of posterior urethral irrigations Prostatic massage is of value only when there is evidence of "pocketing" of pus in the prostate The results with sulphonamides in varying dosage have been unimpressive but good results have been obtained in early cases from protein-shock therapy by means of intravenous TAB vaccine The best technique is the "divided dose" method in which 25 million organisms are given intravenously, followed by a similar dose after 4 hours when the temperature has begun to rise Mechanically produced high prolonged fever by means of the Kettering Hypertherm has been used in 16 cases Temperatures were maintained at 106° F to 107° F for 8 hours in each session and treatments were repeated at intervals of 5–7 days if required The largest number of sessions given in any one case was 6 Earlier experience at the London Hospital in treating a small series of recent acute cases of gonococcal arthritis was most satisfactory , there were no failures The present series was small and very variable as to type and duration of infection No conclusions could be drawn, but with one exception, a case of severe plantar fasciitis, all were improved , 8 patients had chronic conditions of long standing in which complete cure was not to be expected , 2 were cured and 5 remained under treatment having improved considerably The treatment has its dangers and skilful and experienced nursing is essential Approximately 160 patients have been treated, and one died from heat stroke

Major J B KING described some radiological aspects of gonorrhœal arthritis He said that while there are no radiological changes which are entirely characteristic, the findings in the acute phase are often sufficiently suggestive for the possibility of a gonorrhœal cause to be suspected There is often a very thin line of well-marked decalcification immediately under the articular surface This is also seen in other infective joint lesions, but in gonococcal arthritis the integrity of the actual articular surface is preserved to an unusual degree unless the lesion is extremely acute or of long standing The only bony as distinct from joint, manifestations of gonorrhœa which can be considered in any way really typical are those in the os calcis, where there is an irregular, dense posterior cortical hyperostosis, often with the formation of large spurs into the plantar fascia and insertion of the tendo Achillis

Lieut -Colonel T E OSMOND urged the importance of technique in cultivating the gonococcus More positive results should be obtained with cultures than with smears, otherwise the technique of culture must be considered faulty The gonococcus grows best in an atmosphere in which the oxygen tension is lowered and the CO_2 tension increased The surface of the medium should be moist, and differential staining of gonococcal colonies by means of the oxidase test requires experience He agreed that the complement-fixation test for gonorrhœa is much maligned , with a good antigen the test should be positive in 80–90% of cases of gonococcal arthritis He believed that failures with the sulphonamides are due to the fact that metastatic lesions are secondary to closed foci of infection, in which the sulphonamides have been shown to be ineffective In long-standing cases he had no doubt that secondary infection plays a large part in the process

Colonel L W HARRISON deplored the modern tendency to discount the value of drainage of the prostate by digital massage in these cases Good results were obtained with this treatment before modern methods were introduced, and he considered that it must retain its place He agreed that lowered oxygen tension with increase of CO_2 is important for culture of the gonococcus and said that the question of a suitable medium is an antenatal centre and the demand (45% at present, but increasing) for institutional confinement The hospital unit, he thinks, should have its own antenatal centre and associated clinics round about; antenatal work should be carried out by trained obstetricians who could be called on for help by the midwives in the district Other speakers, he noted, favoured a practitioner service, but he thought that any legislation should allow some latitude to different areas Mr Eardley Holland had proposed a scheme for a county area his own scheme is more suited to an industrial area It has given rise to considerable opposition, however, which though quiescent at present will no doubt be resumed at the end of the war

Mr Arnold L Walker said that the chief function of a maternity hospital is to look after the healthy mother and child, we are losing sight of this, and maternity is beginning to be regarded as another disease Too much stress, he thinks, is laid on the value of the ancillary services in general hospitals At voluntary hospitals the obstetricians form a committee, in municipal hospitals one person is in control and he may be the superintendent, the medical officer of health, a whole-time medical officer, or a practising obstetrician Almost all institutions make use of the best obstetric skill available In Willesden a house has been built close to the hospital in which the obstetrician is required to reside but he is subjected to no other restrictions on practice His job is to see that the patients in the hospital are properly treated Mr Walker said he has held this post since 1930 and the division of responsibility has been satisfactory Until 1940 a house-surgeon of his choosing used to be appointed, and it was easy to keep in close contact with all that went on Since December, 1940, there has been no house-surgeon and he has had to undertake more work, but with a staff of competent midwives and some selected general practitioners who can be called in, it has not been difficult to carry on Living so close to the hospital he can see a patient several times in a day or night and there is no temptation to hurry things or to interfere unnecessarily He mentioned that some of the LCC consultants have to come several miles to the hospitals to which they are attached, which may not be satisfactory In staffing maternity institutions he thinks it wise to plan for unification of control but devoutly hopes we shall not see a whole-time service The danger of putting a single person in charge is that he lacks the criticism of his colleagues The service, in his view, should be based on a well-trained body of midwives supported by a limited body of obstetricians

Dr W Allen Daley remarked that the patients will say whether the service is to be institutional or domiciliary, and they are showing a growing preference for hospital care In 1930 there were 10,000 institutional confinements in London, in 1938 there were 21,000 There will always be some domiciliary midwifery Midwives should have adequate training and refresher courses, and doctors too should be properly trained No doubt they are better trained today than they were in the past but in London it is difficult to give them adequate experience owing to the small numbers of beds in the teaching hospitals The LCC, he said, have placed their obstetric units at the disposal of the medical schools They take the view that the general practitioner should be not only willing to undertake midwifery but competent to do it The service should function as a whole, the domiciliary and antenatal services being associated with the hospital service He agreed that obstetricians should live close to the hospitals at which they are to work Administration should cement the partnership between voluntary and municipal agencies Political control in this service is, he finds, a great driving force there is no difficulty in getting people to expend public money on maternity care

Dr G Dick Read said he spoke from the periphery, and he did not look on obstetrics as rabbit breeding, or mothers as people to be shuffled here and there by municipalities He thought the service should be run by central midwifery depots supplying their own ancillary services according to need The obstetrician and the midwife, he said, are essentially physician-minded In a hospital run by gynæcologists he had found that 9% of maternity cases were subjected to cæsarean section and 43% to some sort of surgical interference It is time, he feels, that obstetricians and gynæcologists were separated, and that what we need after the war is a minis of reproduction

Dr Geraldine Winn Everett also spoke from periphery, voicing the opinions of the doctors in her She favoured a general practitioner service The pati and her doctor have a personal relationship, and confinement a woman wants her own doctor who familiar with her physical and mental make-up In any case the number of doctors needed makes it impossible to exclude the general practitioner A list of doctors willing to undertake midwifery should be made out, on the understanding that those giving in their names are also willing to take extra training There should be a central consultant in the area, giving help to all who apply for it, and local consultants who have 10 years postgraduate experience of obstetrics and of general practice, and a higher degree in obstetrics Much of the present antenatal work is done by those who never deliver a case Private patients engage their doctor, midwives' cases should go to a clinic and give the name of the doctor to whom they would like the medical-aid form sent The clinic should be under the local consultant, and all abnormal cases should be seen in consultation with the patient's own doctor She would like to see more and better-equipped local hospitals There is danger in taking an ill woman a long distance to hospital

The Chairman remarked that not all doctors at the periphery were competent to do obstetric practice, as Sir Alexander Macgregor had shown Institutional treatment is increasing, and is showing mortality approaching the irreducible minimum Domiciliary midwifery, he considers, will disappear in large towns, and it is therefore a waste of time to train a large number of young people who are never going to practise obstetrics There should be only one head in a maternity hospital he mentioned the master of the Rotunda as an outstanding example He pointed out that anyone could become an obstetric specialist with constant practice and patience The scheme proposed by Dame Louise he found to be almost identical with that suggested by Blair Bell and himself in 1931 He considers that peripheral difficulties would be more easily settled if there was a central directing body—not an advisory committee—at the Ministry of Health Nobody, it seems, pays any attention to an advisory body

JOINT MEETING WITH THE

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES

At a joint meeting of the section of Physical Medicine of the Royal Society of Medicine and the Medical Society for the Study of Venereal Diseases held at the Royal Victoria Hospital, Netley, on May 16, a discussion on

Gonococcal Arthritis and Rheumatism

and their treatment by mechanically induced pyrexia was opened by Major G D Kersley, president of the section, who described the clinical findings and results of treatment in 50 consecutive cases of metastatic gonorrhœa. He said that, in general, rheumatism associated with gonococcal infection has three striking characteristics, the variety of the manifestations, the variable duration of the period between time of infection and onset of symptoms, and the reaction to hyperpyrexia The problem is to establish the diagnostic criteria by which a case of rheumatism may be regarded as gonococcal In his series there was a patient with a history of attacks of rheumatism for years in whom this flared up with the onset of a gonococcal urethritis Is such rheumatism truly gonococcal or does the toxin of gonorrhœa act in the same way as the toxin of a non-specific infection in causing a flare up of the pre-existing condition in a sensitive individual? There were also 4 cases in which the onset of rheumatism coincided with a recurrence of urethral discharge in which gonococci were not found, at times ranging from 2 months to 21 years after an original attack of gonorrhœa Was this attributable to latent gonococcal infection or to residual non-specific infection in the prostate? Apart from such doubtful cases the clinical syndrome is very varied The brunt of the attack commonly falls on fasciæ, tendons, sheaths and ligaments, particularly the plantar fascia and the sheath of the tendo Achillis Synovitis is common, sometimes progressing to arthritis, especially of the larger joints The effusion may be

THE LANCET

LONDON SATURDAY, MAY 30, 1942

THREE OVER-LORDS

It is a singular triumph for a lowly organism, only iscovered by **Robert Koch** within the lifetime of ome of us, to be able to frame departments and to ictate policies That cocky little fellow, the Scarlet tick in Waiting, may well be proud of serving—of aving indeed brought into being—three organisations which bear his name A large part of the esponsibility for propaganda research and discussion in tuberculosis now rests upon the National ssociation for the Prevention of Tuberculosis, the uberculosis Association, and the Joint Tuberculosis ouncil The public authorities have benefited time nd again from the constructive suggestions and nquiries of these three voluntary organisations , but heir action as a driving power has been likened, renchantly but not unkindly, to the fibrillating uncle—individual ineffective twitchings keeping a luggish stream on the move How much better ould be the powerful systole of combined action ome effective cooperation between them need not ean the elimination of the many societies all over he country now doing excellent work in their own istricts, nor the weakening of the care and aftercare ssociations affiliated to the National Association But with the Tuberculosis Association, which 15 years go linked up the workers in sanatoriums and dispensariès, promoting clinical discussions both in London and at its provincial gatherings , with the Joint Council, just come of age, meeting regularly as representative specialists to consider the broad problems of the moment , there does seem to be a crying need for more intimate contact with the association, founded by **Robert Philip** in 1899, which aims at “ coöperation with other societies having for their object the promotion of public health ”

Some sacrifice of precedence or prestige may be required for such a coalition An old refrain asserted that we've got the ships, we've got the men, we've got the money too, and it has been pointed out that men, money and mentality are unevenly divided among the three over-lords Should there be any truth in the aspersion it is the strongest possible argument for pooling the whole equipment for an anti tuberculosis campaign Medically there need be no rivalry between three bodies of such different scope and it is no misfortune that one of them, by virtue of its size, its wealth, its roval patronage and its international standing—not to mention its permanent offices and machinery—should be able to offer a framework into which the other two can fit From the turn of the century the National Association has been the pioneer in educating the public to regard the prevention of tuberculosis as a social and economic as well as a medical problem, and it has on occasion sponsored epidemiological inquiries such as that of **F C S Bradbury** on Tyneside and **Noel Bardswell** in Cyprus Moreover the three bodies have of late developed affinities rather like that remarkable union of three benzene rings known as anthracene which Thorpe's Dictionary assures us has “ seven conjugated double bonds capable of oscillation ”—surely allowing enough liberty for adventure

So much might have been said before the war, and in fact an article like this was drafted in 1938 when time was spacious and gradualness regarded as inevitable But with the war has come a new threat of tuberculosis making headway and with the threat a new opportunity of meeting it on a combined front The three Fighting Services have all approved routine radiography as the right way of eliminating active tubercle during the period of training and a Labour Minister has included ex-tuberculosis patients in his scheme of industrial rehabilitation Here are two major issues, among many others, on which it is vital that medicine should speak with one voice The U S A has a National Tuberculosis Association which is in a position to advise its government in the name of the whole medical profession Since the end of 1939 we have had a Standing Advisory Committee to the Ministry of Health drawn from the three bodies, which has already gone into such war-time matters as mass radiography, nursing and diet Here is the shadow of a central executive Given the urge and the goodwill the scaffolding of the new fabric could soon be run up

REQUIREMENT OF VITAMIN C

There is still some confusion about what is meant by the requirement of a vitamin It is natural that the first criterion of an adequate intake should be the prevention of deficiency disease On this basis, it is generally agreed that something like 15 mg daily of vitamin C can protect a normal adult from scurvy and some workers are prepared to accept this figure as representing the ordinary requirement[1] Many others however think that the mere absence of frank deficiency disease is not a sufficiently good index of adequate nutrition in respect to any vitamin and prefer the definition of Sir **John Orr** that the physiological ideal is “ a state of well-being such that no improvement can be effected by a change in the diet ”[2] As **Szent-Gyorgyi** says “ Is it right to divide the world into ‘ scurvy ’ and ‘ no scurvy ’ ? How do we know that they [experimental guineapigs on a small intake of vitamin C] were healthy just because they had no scurvy—is ‘ no scurvy ’ the same as health ? ”[3]

A great deal of evidence is accumulating which suggests that there is a wide margin between the amount of vitamin C necessary to prevent scurvy (which may be called the minimal requirement) and the amount necessary for a state of well-being such as that defined by **Orr** (optimal requirement) Experiments on guineapigs show that whereas 1 mg of the vitamin daily prevents the onset of obvious signs of scurvy, about 2 mg is needed for normal tooth development, and 3 mg or more to protect the animal from injury by the injection of diphtheria toxin[3] In other words, the optimal requirement for the guineapig is at least three times the minimal requirement Similar considérations apply without doubt to human requirements It is probable that for a great number of people in this country the average peace-time consumption of vitamin C was something like 15 or 20 mg a day and it was argued that since scurvy did not arise this intake was sufficient But in fact scurvy was not unknown in peace-time and there has been an increase since the outbreak of war[4] There is clearly much individual variation in requirements , thus a daily intake of 12–25 mg of ascorbic important one for future research It has been stated that the presence of starch in a culture medium is more important than animal protein for the growth of the gonococcus This is one of many questions which have to be investigated

Other speakers discussed the incidence and situation of the lesions of keratodermia blenorrhagica, the differential diagnosis between metastatic gonorrhœa and chronic meningococcal septicæmia, and the question of the optimum duration of sessions of high fever for the treatment of metastatic gonorrhœa

Reviews of Books

Seasonal Influence on Growth, Function and Inheritance

A B Fitt, Ph D, professor of education, Auckland University College Wellington New Zealand Council for Educational Research, London Humphrey Milford, Oxford University Press Pp 182 10s 6d

The accident of birth is beyond our control, and few of us begrudge the other fellow his cleverness or other natural advantages, but generations unborn may echo Tristram Shandy's strictures upon his parents when they learn from Professor Fitt's book that their height, strength and intelligence may be a bit below par because they were not conceived in the best months of the year—in this hemisphere approximately September to December Indeed, it appears that nature urges us in the wrong direction, for although babies conceived during this period are less likely to die in the first month of life there are less of them than of the poorer quality conceived in the March–May period These, perhaps, are the most startling conclusions from the painstaking statistical work recorded in this book, but of more practical importance is the evidence, rarely quite final but in sum irresistible, that human beings are at their best and most stable, physically, intellectually and morally, during the autumn-winter period, and at their worst during the spring-summer months In children, statistics have been analysed on height and weight increase, intelligence tests, illness and delinquency, in adults on output of work, mortality and suicide They have been taken both from Professor Fitt's own investigations and from other sources, and although alternative explanations would be found for many individual groups of data, their agreement in trend is difficult to account for in any other way than by the assumption of an inherent seasonal rhythm Numerous minor and incomplete investigations fit in with the general scheme The fluctuations are not large, but he points out their implications for short-term measurements of rates of change in height, weight and intelligence, for the timing of examinations and the organisation of work, for the study of crime and delinquency, and for the practice of medicine The underlying cause of the rhythm is discussed, and some ingenious parallels with hibernation advanced, the pituitary and hypothalamus coming in for their inevitable share of attention The book is important as a pioneer work, and the investigation ought to be carefully repeated in different parts of the world We may yet have much to learn about the natural history of our own species

Handbook of Midwifery

(11th ed) Sir Comyns Berkeley, M D Camb, F R C P, F R C S, F R C O G London Cassell and Co Pp 622 8s 6d

This well-illustrated book is written for pupil midwives and medical students, a body of the profession that the author has spent a lifetime in teaching and examining No single man is better qualified for this job than he and this eleventh edition of a book that was born in 1906 and is still going strong is probably the best of its kind The arrangement ensures study of the physiological before the pathological, and stresses the normality of the average pregnancy and labour One small but important criticism must be made Sir Comyns gives directions for the guidance of the midwife if she is directed by the doctor to continue the *administration of chloroform* and these directions are wise and good But it is still questioned by some whether chloroform should be administered to a woman in labour, and more doubtful still whether it should be given by an unqualified person The supervision a *doctor conducting* a difficult forceps delivery can give to the anæsthetic is necessarily perfunctory, and there is no good evidence that the p woman takes chloroform better than anyone else liver may already be taxed by a mild toxæmia and *such cases chloroform is a danger* Perhaps in subsequent editions Sir Comyns will incorporate a small section on the alternative methods of anæsthesia available for domiciliary use

Functional Pathology

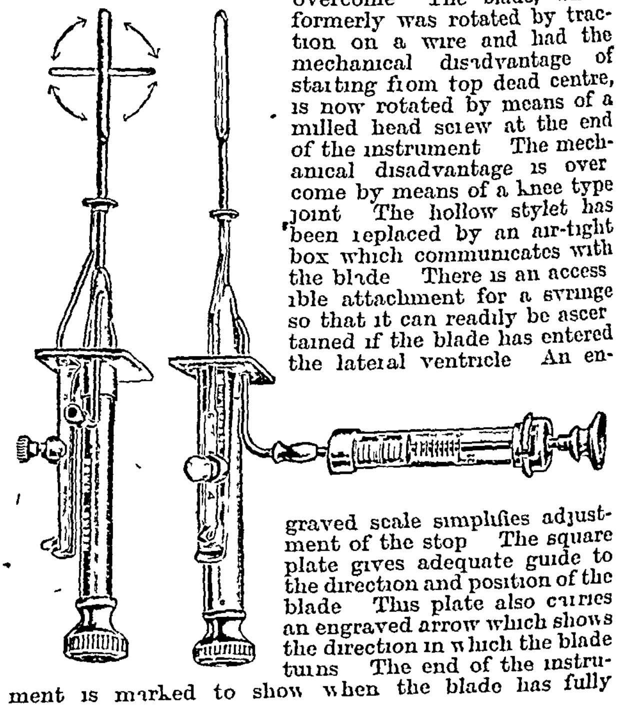
Leopold Lichtwitz, M D, clinical professor of medicine, Columbia University New York Grune and Stratton Pp 567

The mechanism of diseased function is not simple because the control of normal function is ill understood and because structural changes in the body are not always present to account for signs and symptoms This is not a textbook but a personal interpretation, after thirty years of clinical and laboratory experience of the manifestations of the main medical ailments Endocrine disorders and rheumatism, for example, are fully described and allergy is given more attention than most English writers would give it Some readers may doubt whether it has been proved conclusively that acute glomerular nephritis is an allergic disease or that Henoch's purpura is an example of anergy The short chapters which discuss body-water and the pathology of intracellular oxidation are among the best Not much is said of treatment but the writer believes garlic useful for hypertension despite its disadvantages Throughout Professor Lichtwitz uses the informal, discursive and reminiscent tone of the clinic, and draws his illustrations from a wide knowledge of history and a wealth of lesser known sources of reference The book has excellent photographs, useful tables and charts and should fulfil the author's wish to stimulate discussion

New Inventions

AN IMPROVED LEUCOTOME

This instrument retains the essential features of that described by us in The Lancet (1941, ii, 7) Certain disadvantages of the original have, however, been overcome The blade, which formerly was rotated by traction on a wire and had the mechanical disadvantage of starting from top dead centre, is now rotated by means of a milled head screw at the end of the instrument The mechanical disadvantage is overcome by means of a knee type joint The hollow stylet has been replaced by an air-tight box which communicates with the blade There is an accessible attachment for a syringe so that it can readily be ascertained if the blade has entered the lateral ventricle An engraved scale simplifies adjustment of the stop The square plate gives adequate guide to the direction and position of the blade This plate also carries an engraved arrow which shows the direction in which the blade turns The end of the instrument is marked to show when the blade has fully rotated



The instrument is nicely balanced and has proved entirely satisfactory in use It is being made by Messrs Down Bros who also supply the special localisation plate, dural hook and scissors which we use for the operation

J S McGregor, M D Glasg
J R Crumbie, M B Lond, F R C S E

Doubt is being cast on the credentials of some of the opening medicines most commonly used Thus phenolphthalein has long been esteemed for its ability to produce several evacuations, but it is said that this action, which depends on the re-excretion of the drug in the bile, may do harm to the gall-bladder And now it is liquid paraffin's turn Liquid paraffin has been regarded as approximating as closely as possible to the ideal laxative The student is taught that its action is entirely mechanical the mineral oil is said to mix intimately with the food and thus a film of oil is formed between the contents of the bowel and the intestinal mucosa facilitating the passage of food along the alimentary canal This conception of its pharmacological action is clearly unsatisfactory In the first place, a considerable amount of liquid paraffin finds its way from the intestine to the liver and other viscera Furthermore, the intestinal contents proximal to the splenic flexure are fluid, and there is no reason to think that a bland lubricant could materially affect the rate of progress of the chyme along the bowel Whereas the rectum is normally empty, MORGAN[1] of San Francisco maintains that liquid paraffin renders the rectosigmoidal "valve incompetent, and permits continual leakage of a mixture of oil and fæces into the rectum , and these abnormal conditions produce symptoms of irritation, the stimuli often failing to excite the defæcation reflex Leakage through the anal sphincter with consequent soiling of the clothing is generally regarded as liquid paraffin's only serious disadvantage But MORGAN believes that paraffin is a cause of pruritus by irritation of the delicate perianal skin, and in patients with rectal lesions, including fistulæ, he has observed that healing is more rapid when liquid paraffin is avoided

After taking liquid paraffin many people are aware of borborygmi and may even experience mild griping These effects are consistent with the suggestion that its laxative action is at any rate partly due to irritation of the intestinal mucosa Further evidence that the oil is not wholly bland is the dyspepsia which sometimes follows its prolonged administration Again, the almost continuous presence of liquid paraffin in the bowel may interfere with absorption in the small intestine both by hurrying the food along and by coating the mucosa In particular, it is thought to hinder the complete absorption of the fat-soluble vitamins, and under war conditions this deserves careful consideration MORGAN goes so far as to describe a syndrome characterised by anorexia, indigestion, flatulence, fatigue, nervousness, dyschesia loss of weight and anal leakage produced by the prolonged administration of liquid paraffin, and rapidly disappearing when it is discontinued These sequelæ arise only when the oil is given daily for months or years MORGAN admits that there is no serious objection to the use of liquid paraffin for a short time (presumably not more than a month) in order to re establish bowel function In most cases, however, a small dose of one of the anthracene purgatives (cascara, senna and the like) at night is probably the method of choice If after a few weeks the drug can be withdrawn without interfering with the patient's bowel rhythm, well and good if not he can continue with his after-dinner pill indefinitely without much risk of habituation

---

[1] Morgan. J W *J Amer med Ass* 1941 117, 1335

Annotations

UNDERGROUND SURGERY AT ROEHAMPTON

QUEEN MARY'S Roehampton Hospital has been famous since 1915 for the care it gives to Service men who have lost limbs In this war civilians too, have been received in the generous eighteenth century building and its many extensions The newest of these, declared open by Lord Horder on May 20, includes an underground theatre, air conditioned and provided with no less than three lighting systems one from the main one from batteries and one from a special generator Only a direct hit could plunge that theatre in darkness Close by it is a resuscitation ward of 32 beds and two side wards of one bed each, every bed being equipped with an oxygen mask fed from cylinders centrally placed in a cupboard The anæsthetic cylinders too are housed in this cupboard and the gases are fed to the theatre by tubes Both the wards and the theatre receive air drawn through charcoal filters so that in the event of a gas attack neither staff nor patients need be inconvenienced The extension also holds a light and airy refectory which can accommodate 500 patients , the dark green blackout curtains looked pleasant against the pale walls and in a well equipped kitchen a dinner of soup fish, potatoes peas cabbage and milk pudding was under way Lord Horder in his opening address recalled the work of Mrs Gwynne Holford whose energy and determination had done so much to found the hospital in 1915 and who still took a keen interest in its progress Of the 41,000 men who lost limbs in the last war, he said, 26,000 had been fitted with new limbs at Roehampton and since 1939, over 1100 patients—many of them women and 20 of them children—have already been treated He spoke of the help the patient needed to adjust himself psychologically to his injury as well as to acquire compensatory skill Roehampton is extending its scope and now undertakes orthopædic work other than amputations, faciomaxillary and chest surgery as well as general surgery and medicine Sir Walter Womersley, the Minister of Pensions said that the task of the hospital was to fit those who left it to earn their living After the last war the plan had broken down when it came to finding them employment but this time he had hoped that the Government would plan ahead so that when peace came patients would leave the hospital to enter a job A demonstration by patients of what can be done with artificial limbs was as impressive as usual

ASSESSMENT OF THE HEAVYWEIGHT

THE accepted standards for a person's "correct" weight are based on the relationship between height, age and sex, and most insurance companies allow a variation of plus or minus 15–20% from the average figures as being within the normal But many healthy people lie outside these limits, and Behnke, Feen and Welham[1] of the U S Navy point out how ludicrous it is that 17 out of 20 exceptionally fit professional football-players they examined would have been refused for military service and not passed as first class lives for insurance because they were overweight They suggest that some other standard is required for estimating obesity, and argue that it is the relation of weight to volume that is the important factor The specific gravity of bone salts is about 3 0, of adipose tissue 0 94 of all other tissues 1 06, and it is mainly variations in the proportion of adipose tissue that determines the specific gravity of the body as a whole Thus if a lean man weighing ten stone accumulates 60 lb of fat his specific gravity will fall from 1 08 to 1 03 Behnke and his colleagues have accordingly set out to determine the specific gravity of healthy people They use the familiar Archimedes principle of weighing in air and in water, the subject acid was insufficient to prevent scurvy occurring in 12 mine labourers out of 950 studied[5] More important are recent reports that an increased consumption of the vitamin does indeed produce an improvement in general health GLAZEBROOK and THOMSON[6] found that a supplement of vitamin C given to over 300 boys between the ages of 15 and 20 reduced the duration of tonsillitis, still more striking was the fact that not one case of rheumatism or of pneumonia developed in these lads whereas there were 5 or 6 cases of each in the same number of controls not receiving the supplement A report of a similar experiment on a much larger scale comes from Germany, where more than 1½ million children aged 10–14 years received an addition of 50 mg of vitamin C to their normal diets[7] This resulted in an increased *resistance to infection and an acceleration in physical* development In British naval trainees, too, the incidence of gingivitis was four times as great in those on ordinary diets as in those given supplementary vitamin C[8] There are also indications from many workers that supplements of vitamin C promote the healing of wounds[9] Apart from the experiments with guineapigs and the beneficial effects of increased dietary vitamin C in humans, a third approach to the problem of the requirements of the vitamin also suggests that these are likely to be a good deal higher than 15 mg It has been shown with vitamin B_1 that with increasing intake a level is reached which results in a sudden increase in the proportion excreted in the urine[10] The explanation of this is that the intake at which the excretion begins to rise represents the requirement of the vitamin, and in fact the figure so found—300–350 IU—agrees closely with values found by other methods Experiments of this type with vitamin C show that a considerable rise in urinary excretion occurs only when the intake exceeds 100 mg daily[11] This seems a large amount but many other workers using somewhat similar methods assess the requirements at something between 50 and 100 mg daily[12] From a review of published work SMITH[13] concluded a few years ago that the barely adequate daily intake, with little margin of safety or allowance for individual variations in requirement was 50–60 mg for adults, 40 mg for children and 20 mg for infants

---

[1] Behnke, A R Feen B A. and Welham W C *J Amer med Ass* 1942 118, 495

The question now arises, how may one detect the milder degrees of deficiency which will result from a consumption of vitamin C in quantities below the optimal but above the minimal requirements ? It is obviously not practical in individual cases to supplement the diet with additional vitamin C and determine an improvement such as increased resistance to pneumonia or rheumatic fever Clinically, too, changes due to slight deficiency are not easy to demonstrate Decreased capillary fragility, gums which bleed readily, the presence of hyperkeratotic papules and similar changes occur only in moderately severe deficiency and not all of them are specific to deficiency of vitamin C or occur regularly[14] The determination of the concentration of the vitamin in the blood, however, does appear to give an indication of the nutritional status of the individual, although there are several possible difficulties in the interpretation of the results Another and probably more satisfactory method is that of saturation, in which large test doses of the vitamin are given each day until a considerable proportion is excreted in the urine It is known that people suffering from scurvy require some 10 da doses of 70 mg per stone body-weight before sat tion is reached while those whose intake is abo 50 mg a day are saturated after the first or second day of such doses In other words, the number of days of test-dosing required to produce saturation is propor tional to the degree of deficiency, increasing from one to ten days as the intake decreases from the optimal to below the minimal requirements Studies such as those of HARRIS and of FRANCIS and WORMALL in this issue have shown that the intake of vitamin C has fallen since the war began It is not suggested that these results point to the probability of a widespread outbreak of scurvy, but they do indicate that the intake, especially of elementary-school children, i falling below the optimal level Such studies are of *great value in focusing attention on the need for* improvement in the consumption of the vitamin before the effects of the decreased intake show themselves in a deterioration of general health

1 Kellie A E and Zilva, S S *Biochem J* 1939 33, 153 2 *Food Health and Income*, London 1936 3 Szent Gyorgyi A V *On Oxidation, Fermentation, Vitamins Health and Dis* Baltimore 1939 4 Paterson, D and Daynes, W G *Brit med J* 1941, ii, 787 5 Fox, F W, Dangerfield, L F Gottlieb, S F and Jokl, E *Ibid*, 1940 ii, 143 6 Glazebrook A J and Thomson, S *J Hyg Camb* 1942 42, 1 7 *Bull War Med* 1941, 2 1 8 Roff F S and Glazebrook A J *J R nav med Serv* 1939, 25, 340 9 Lund, C C and Crandon, J H *Ann Surg* 1941, 114, 776, Campbell, H G and Cook, R P *Brit Dent J* 1942, 72, 6 10 Wang Y L and Yudkin, J *Biochem J* 1940, 34 341 11 Ralli, E P, Friedman, G J and Sherry, S *J clin Invest* 1939, 18 705 1 Chen K C, Yu, T F, Liu S H and Chu, H I *Chin J Physiol* 1940, 15, 119 13 Smith, S L *J Amer med As* 1938, 111, 1153 14 Munro, H N, Lazarus, S and Bell, G H *Lancet*, 1942, i, 648

LUBRICANT OR IRRITANT?

FROM a hundred hoardings the finger of scorn is pointed at the wretched citizen hurrying to work with bowels unmoved, and the weary dyschesic, reflecting on the trials of strength that must occupy his leisure hours, is doubtless grateful for the disappearance of neon signs that formerly insisted on explaining how to be happy though constipated HURST has repeatedly shown that true constipation is rare, and that most people with irregular action of the bowels are the victims of dyschesia The bowel, a creature of habit, as HUTCHISON calls it, should be properly brought up, "constipation" almost invariably *originates in faulty training* and is perpetuated by the abuse of purgatives Among the worst enemies of the intestine are the nurses of the average hospital If the ward sister would take a lesson from her industrial counterpart, the works manager, she would avoid attempts at regimentation, and by allowing patients' bowels to express their individual rhythms she would succeed in staggering the bedpan parade Instead we find the junior probationer making a round of the patients every evening, bearing on a tray a formidable selection of more or less explosive mixtures Her reassuring smile and the pleasurable associations of her inquiry, "What's yours ?" raise hopes that are rarely fulfilled, and special attention is paid to patients whose record in the Bowel Book shows a discreditable sprinkling of noughts The ordering of purgatives does not receive the attention it deserves from visiting staffs, and this omission has serious effects on those who form the changing population of our hospitals At a time when we are hard pressed for supplies of many *purgatives* every doctor should look twice at the pill he is ordering and ask "Is your journey really necessary ?"

that the surgeon and anæsthetist " could not relieve or excuse themselves from the performance of their duty because the hospital or the nursing staff or some of them failed to perform their duties with due care and caution " The surgeon was entitled to rely upon the careful administration of the ether by a skilled and competent anæsthetist No fact was proved which suggested that he ought reasonably to have anticipated negligence, whether wilful or accidental, on the part of the anæsthetist Indeed the proximate cause of the injury was not in the administration of the ether but in the dropping of the bottle on the floor, which broke it and allowed the ether to escape Such an untoward event was not one which the surgeon ought reasonably to have anticipated, nor would any jury be justified in making any finding to that effect On the other hand " an accident such as happened does not ordinarily occur if those in control of the anæsthetic use proper care " Thus the court distinguished between the surgeon and the anæsthetist and found that the latter was negligent although nothing in the reported evidence showed that the bottle had been knocked over by him Incidentally, however, it did show that an unusual number of staff were present in the small theatre

The operation was performed in the Mater Misericordiæ Hospital, a public hospital in North Sydney, and it is remarkable that the hospital authorities were not joined as defendants One report states that the mother superior and the matron were present and another that the medical superintendent was also in the theatre But apart from the presence of representatives of the administration there is the fact that the only means of heating was this electric radiator, and, as Jordan C J, observed, " there is evidence that in this country [New South Wales] ether is the universal general anæsthetic " In England a hospital might have difficulty in escaping liability under these circumstances, especially having regard to the warning memorandum issued six years ago by the Ministry of Health on the dangers of explosion The annual report of the Medical Defence Union for 1938 mentions a claim arising out of an operation under direct vision by a laryngoscope with distal lighting The patient's personal representatives sued the hospital as well as the surgeon The latter had carefully tested the apparatus, nevertheless there was an ether explosion, attributed to one lead of a flex having been loosened The case was settled out of court

SEVERE CHICKENPOX

THE administrative problems of varicella are vexatious but its risk to the patient is slight, fortunately so, since control is extremely difficult, particularly in closed communities containing children In the rare fatal cases death normally results from intercurrent infection, usually in debilitated subjects, and to this generality forms such as varicella gangrenosa are strictly not exceptions Nevertheless the staff of one American hospital[1] record two quite unrelated cases of severe varicella occurring within a short time of each other and both in adults One patient recovered after a serious illness complicated by bronchopneumonia, pleurisy and osteomyelitis of the lower jaw The other, a man of 40, died in coma within 4 days of admission A very complete post-mortem examination revealed bronchopneumonia of a mononuclear and proliferative type, diffuse encephalitis with some areas of perivascular demyelination, and acute nephritis The lesions in the central nervous system are of particular interest Neurotropism is not a rare feature of the varicella virus, and Underwood,[2] from a survey of recorded cases, concluded that encephalitis was the commonest single manifestation However, examples have usually been met in children and the tendency is on the whole towards recovery This, and the presence of other severe complications in the present fatal case, raises the important issue as to whether this was in fact an atypical attack of smallpox In support of their diagnosis Waring and his colleagues cite a known exposure to varicella and a vesicular eruption without umbilication appearing in crops, concentrated most heavily over the head and trunk and absent from the palms and soles More detail on the important question of distribution would have been helpful, but the available data do indicate that this was a genuine attack of varicella

SAVING ALCOHOL WITHOUT BOTHER

THE change over from the familiar tinctures to liquid extracts or the concentrated tinctures introduced in the fifth addendum to the BP (*Lancet*, April 25, p 518) is not easy for prescribers, but a Scarce Substances Order now made by the Ministry of Health puts the burden on dispensers instead In this order alternatives approved by the Medical Research Council are laid down for most of the BP tinctures, the main absentees being digitalis, iodine, opium and ammoniated quinine, and for spirits of nitrous ether, ammoniated spirits of ammonia and spirits of chloroform and peppermint In future when one of these preparations is ordered the chemist will be free to dispense the alternative without reference to the prescriber, unless the prescription has been marked NA, meaning " no alternative " This means that the doctor can if he likes order tinctures exactly as before, and it is hoped that NA will rarely be seen A few minor changes have been made in the National War Formulary, including a reduction in the menthol and camphor in nebula ephedrinæ and nebula mentholis et thymolis co from gr 8 to gr 4 per fl oz A new haustus chloralis has also been added to the formulary, containing chloral hydrate gr 20, elixir of saccharin min 5 and water to 1½ fl oz This is in addition to the existing draught of chloral and bromide

A SECOND SCOTTISH NEUROSURGICAL UNIT

ON May 15 Mr Thomas Johnston, M P, secretary of state for Scotland, opened a neurosurgical unit some 13 miles outside Glasgow to serve the west side of the country The east side is served by a convenient centre in Lothian The new unit, which is one of the EMS hospitals, has been organised under the chairmanship of Sir Hector Hetherington by the central health department in coöperation with Glasgow corporation and the three main voluntary hospitals which have all combined to provide staff and equipment The staff includes two neurosurgeons—Mr J Eric Paterson, who has administrative charge of the unit, and Mr J Sloan Robertson—a neurologist (Dr J B Gaylor), whole-time anæsthetist and pathologist, while the general staff of the hospital will lend a hand when needed The unit is available for all types of neurosurgical case, including hospital and private patients, " scheme patients " under the EMS, and members of H M Services It will be administered by the health department, liaison with Glasgow hospitals being maintained through an advisory committee under the chairmanship of the regional surgical director, Prof C F W Illingworth, who, at the opening ceremony, described the scope and purpose of the unit Of the conditions they would have to deal with two were of particular importance Many brain tumours, although not inherently malignant, are extremely dangerous, improved technique has made it possible to remove them completely or to give a considerable measure of relief In war-time of course injuries to the brain claimed precedence For both of these the unit would provide the means of research Mr Johnston stated his preference for coöperative over competitive units If the teaching hospitals, the Glasgow municipality, and the central authority had all set up units of their own they might well have proved inefficient as teaching instruments owing to the comparatively small number of cases at each being suspended under water by a line connected to a spring balance, and kept down with a lead belt The main sources of error are the air in the lungs and in the abdominal viscera The volume of residual air in the lungs varies considerably in different people, so that this must be estimated, if any individual accuracy is aimed at, and it was done in all the 99 subjects studied by a helium-dilution method The error from abdominal gases was minimised by doing the weighings before breakfast One man weighed 183 lb in air and 23 2 lb at full expiration in water The weight of his lead belt was 13 75 lb , and the correction for residual air 2 65 lb , so that his net weight in water was 23 2 – 13 75 + 2 65 = 12 10 lb His specific gravity was therefore 183/(183–12 10) = 1 071 In these subjects—healthy American sailors—the specific gravity ranged from 1 020 to 1 099, and on the whole the lightest men, having least fat about them, had the highest specific gravity Thus the average weight of the men with specific gravity between 1 020 and 1 030 was 16 st 9 lb , and of those between 1 090 and 1 099 it was 10 st This relationship did not always hold for the supermen, the professional football-players One man, for instance, weighed 15 st 10 lb and even though he was 6 ft 3 in would have been labelled overweight, but his specific gravity of 1 081 showed that his weight was beef and not blubber Behnke and his colleagues propose a specific gravity of 1 060 as a dividing line for the elimination of the obese On this standard only 2 of the 20 footballers would be overweight Weighing in water, and more particularly the estimation of residual air, could hardly be applied to all recruits who look on the plump side, nor to candidates for life insurance When groups of men were taken together Welham and Behnke[2] demonstrated a close correlation between specific gravity and the difference between the circumferences of chest and abdomen In the athletes the chest measurement averaged 6 9 in more than the abdominal, and in the lean naval men 6 8 in , whereas in the group with a low specific gravity the average difference was only 4 5 in Unfortunately this correlation does not hold for individuals, so that the investigation has not given us any simple way of filling the gap in present methods of body measurement Height-weight tables might be more helpful if they were based on sitting height

---

[1] Waring, J J Neubuerger, K and Geever, E F *Arch intern Med* 1942, 68, 384

[2] Underwood, E A *Brit J Child Dis* 1935, 32, 83, 177, 241

DIAGNOSIS OF CORONARY DISEASE

Coronary disease has become such a commonplace diagnosis of recent years that there is a chance of the phrase becoming meaningless Marvin[3] has emphasised the features which alone justify this diagnosis Clinically they consist of angina pectoris, coronary thrombosis, or congestive heart-failure for which no other cause can be found Of these the last is much the rarest The symptoms of angina pectoris are characteristic, though the important differential diagnosis of left inframammary pain is sometimes difficult Angina pectoris found with severe anæmia, paroxysmal tachycardia, hyperthyroidism, or great enlargement of the heart need not necessarily be due to, or even associated with, coronary sclerosis Coronary thrombosis is of course the outstanding manifestation of coronary disease Diagnosis of coronary disease on the presence of congestive heart-failure can only be made by exclusion of other causes of failure, such as hypertension, rheumatic and syphilitic disease and vitamin-B deficiency Radiology is of comparatively little help in the diagnosis of coronary disease, though Master and his colleagues[4] have claimed that in 58 of their 80 patients with myocardial infarction they detected localised abnormalities in pulsation of the ventricle Screening is obviously impracticable in the acute stage of coronary thrombosis and probably there are not many cases in which it give more information than can be obtained from and electrocardiographic investigations , in the case cardiac aneurysm, of course, the position is different Marvin is perhaps too-sweeping in his ments on the electrocardiographic findings in branch block Provided all three criteria are (duration of QRS greater than 0 1 sec , notching or of QRS, and T in the opposite direction to QRS) diagnosis nearly always indicates myocardial though naturally other ætiological factors such diphtheria, acute rheumatism and syphilis must excluded before coronary sclerosis can be incriminated as the cause That low voltage of the ventricular complex by itself is of little if any value as an indication of heart disease is generally agreed , such extracardiac causes as inadequately applied electrodes, subcutaneous œdema, and the thickened skin of myxœdema must be excluded Nor must prominence of Q_3 by itself be taken to signify a myocardial lesion. It is in the interpretation of alterations in the ST segment and the T wave that most mistakes are made , Marvin quotes a list of 41 different conditions, other than coronary sclerosis, in which such changes may occur, and only 33 of these imply heart disease As he points out, " if myocardial infarction is excluded, there is no change in the electrocardiogram that in itself justifies the diagnosis of coronary disease " Coronary disease may often be suspected, but unless we accept definite criteria and observe the extent to which the single case complies with, or varies from, these we shall never attain that accuracy in early diagnosis which is essential now that coronary disease is taking a steadily increasing toll of life

ANÆSTHETIST TAKES THE BLAME

The liability of the anæsthetist as distinct from the surgeon has recently been the subject of a decision by the High Court of New South Wales[1] and is of interest as proceedings were taken against both The plaintiff claimed damages for joint negligence by which his wife's *hand was burnt during an operation* At the date of the operation the weather was cold and the theatre, with which both defendants were familiar, was heated by " an electric radiator of the cone type, the heating element of which consisted of wires exposed to the air, which became red-hot when the current was turned on " The first hearing arose on a technical objection that under the old English Common Law Procedure Acts, which are still in force in New South Wales, proceedings could not be taken against joint tortfeasors Jordan, C J , giving the judgment of the court, laid down for guidance on the new trial which was ordered that " except where combination is the gist of the tort, in an action brought against two persons as joint tortfeasors, one may be *convicted and the other acquitted* " At the re hearing the Supreme Court gave judgment against the surgeon and the anæsthetist On appeal the High Court decided in favour of the surgeon and (by a majority) against the anæsthetist The case did not turn *entirely* on the administration of the anæsthetic It was administered by dropping ether out of a glass bottle from time to time on to gauze stretched on a wire frame placed over the patient's face The anæsthetist was sitting at the side of the operating table near her head He had a table alongside on which the bottle was placed when he was not using it to drop the ether on to the mask Somebody knocked the bottle of ether on to the floor The fumes of the ether formed a combustible mixture, which was exploded by the heating element in the radiator situated about six feet from the operating table The explosion caused a fire on the floor which spread to the bottom of the table and severely burned the patient's right hand which was hanging down over the side Starke, J , in delivering the judgment of the court, said

---

[2] *Ibid*, p 498
[3] Marvin, H M *New Engl J Med* 1942, 226 251
[4] Master, A M, Gubner, R , Dack, S and Jaffe, H L *Amer Heart J* 1940, 20, 475

[1] Paton v Parker *Aust Law J* 1942, p 285

Special Articles

LESSONS FROM THE LOUSE

A STUDY IN SYMBIOSIS

"*A Hair perhaps divides the False and True*"

F. WOOD JONES, M.B., D.SC. LOND., F.R.S.
PROFESSOR OF ANATOMY IN THE UNIVERSITY OF MANCHESTER

IN times of war there are two parasitic forms of life that enjoy special privileges and experience an enhanced prosperity, thereby receiving more attention than is devoted to them in times of peace. With the first of these—the profiteer—we have no immediate concern. With the second—the louse—we are profoundly interested, and we would be loth to do the louse that injustice that would be implied in dealing with him and the profiteer in a common survey. Only this is it necessary to say: that the louse and the profiteer are alike in that they are always with us, in peace as in war; but it is only in war that their activities become sufficiently conspicuous and charged with a grave enough threat to the community for them to be regarded seriously. The louse experiences recurrent phases of notoriety because of its ability to act as a vector of disease when crowded and unhygienic living conditions favour its maximum multiplication and racial prosperity. But there are other lessons which the louse can teach us when we consider it apart from all its homicidal glory.

To continue with the tent-maker "a single Alif were the clue—could we but find it—to the Treasure-house, and peradventure to the Master too." Here, maybe, we might substitute louse for Alif and not greatly disturb old Omar's line of thought. For it seems possible that the louse may hold the clue to the understanding of certain things that perhaps the very minutiæ of modern knowledge are apt to obscure. Man is a peculiar zoological type when he is considered among the mammalian assemblage to which, from taxonomic considerations, he appears to belong. In hair development he shows his specific peculiarities almost as remarkably as he does in some of his less overt characters. He is remarkably distinguished by an extraordinary development of scalp hair (unmixed with any under fur) and by a sparsity of development of his general body hair. This remarkable scalp hair is a human specific character, and as an inhabitant of this peculiar environment one member of the order anoplura, in an inconceivably distant past, adapted itself to live a happy parasitic life. This adaptation was so complete that the human head louse is confined to man as a host species. Its only near relations are to be found on some monkeys and apes, and it is only very rarely that menagerie monkeys have received accidental infestations of human lice from human companions. The first lesson that the louse can teach us, therefore, is that man, with his peculiar scalp hair has possessed this specific distinction long enough to permit of the differentiation of a species of ectoparasite peculiar to himself. Moreover this ectoparasite possesses morphological characters that are obviously specific adaptations to the specialised environment of the human scalp.

The second lesson is that the lice inhabiting the scalp hair of different human races evince such morphological differences that they have been claimed at one time and another by various authorities to have attained the rank of separate species. It is probable that this claim for the specific differentiation of the lice of different human races has been pressed too far by certain entomologists. It is now generally agreed that such racial differences are to be considered as ranking no higher than subspecific or varietal in importance and that all human head lice are embraced in the single species *Pediculus humanus*. This is exactly what we should expect if all races of mankind are rightly considered as being comprised in the species *Homo sapiens*. We might, therefore, claim that man had been a distinct species long enough to permit some humble member of the anoplura, that chanced to take a fancy to living in his scalp hair, to become itself a distinct species adapted to the environment of the human head. It would also seem to be true that the separation of human races had taken place in such a very distant past that, despite the disturbing factors of human intercourse and racial mixture, there has been developed a well-differentiated series of racial or subspecific forms of *P. humanus*.

But man is also a peculiar mammal in that he possesses certain island sites of hair and here again he has his own specific ectoparasite. *Phthirius pubis* does not even belong to the same genus as does the head louse and its generic differentiation would seem to be definitely created by its environment. One such adaptation is probably seen in the size and shape of its claws, which differ from those of *P. humanus* and appear to be correlated with the type of hair to which it has to cling in its island site. It is to be doubted if mankind have sufficient pride in the antiquity of their lineage as evidenced by the fact that they have developed at least two distinct and peculiar species of lice which are theirs and theirs only. This is all the more strange when one considers the inordinate pride of one who has inherited an estate of such respectable antiquity as to have become the home of some especial breed of piebald pig.

But this is not the only guarantee the louse provides of the antiquity of our type and of our vaunted civilisation. The naked savage is somewhat at a disadvantage when compared with civilised man in that, at the best, he is only likely to possess on his corporeal estate a stock of head lice and may be a relatively trivial number of *Ph. pubis*. Civilised man has the advantage of him in that, in addition to these, he may have a flourishing establishment of body lice. When I was a student it was the accepted teaching that the human head louse (*P. capitis*) was a creature altogether distinct from the body louse (*P. vestimenti*) and indeed there was much to justify that teaching. Head lice and body lice differ in their morphological characters, their life histories, and their habits. There seemed sufficient reason for regarding them as different species, and as such they were described by most authorities. But a natural doubt arose: if the unclothed man possessed only head lice it was possible that the addition of clothing to the comparatively hairless human body had enlarged the estate of *P. humanus* and permitted it to roam at large and bring new territories under its sway. And this seems to be a just statement of the case. Once its host had donned clothing the original human head louse found a new environment with all the advantages of constant temperature and a regulated atmosphere. It only needed to creep down the neck to find vast new worlds, just as the early navigators found the Americas with all their wealth and possibilities of colonisation. The new environment was a safe one for the louse, but it entailed some changes in habit and so resulted in some changes of form. The body louse became differentiated from the head louse. The head louse is described by Smart[1] as being usually browner, tougher in texture, smaller, with the segments of its antennæ less attenuated, with more deeply incised abdominal clefts and with thorax narrower anteriorly than the body louse. Recognised species have been founded a thousand times on differences less than these, but here is the rub. Smart says "head lice and body lice can be interbred and such matings produce fertile offspring which may show characteristics intermediate between those of the parents. When head lice are bred continuously for several generations on the body they tend to become modified and to assume the characteristics of body lice. In a state of nature, head lice may be found infesting the body, but body lice are never found infesting the hair of the head." Because of all this, it is now generally agreed that the body louse is merely a variety or subspecies of the ancestral head louse and the two forms are now known as *P. humanus capitis* and *P. humanus corporis*. It is here that more lessons to be learned from the louse would seem to emerge. Civilised man may probably pride himself on the fact that judged by the standard of being clothed (even if not in his right mind) his civilisation is so ancient that it has already afforded time for the differentiation of a form of parasite which has attained to well-established subspecific rank.

There are more general biological implications in this apparently simple happening than those involved in the antiquity of clothing. The body louse has become

---

[1] Smart, J. (1942) Lice. Economic series No. 24. British Museum Publication.

PROSPECTS FOR MILK DRINKERS

As a nation we are now beginning to take milk seriously as a food Prof H D Kay, D Sc , speaking at the Royal Society of Arts on May 20 said that the average quantity of milk per head needed to raise the nutrition of our people to the level at which physical growth and development (as far as these depend on nutrition) were at their best had been estimated at 0 8–1 pint a day At present, despite the levelling up of milk consumption by the cheap milk scheme, we are only drinking just over 0 4 pint per head daily which is slightly less than the amount consumed in the very poorest of American cities To reach the 0 8 pint level we need 1650 million gallons a year—or a 75% increase on our winter milk and a 30% increase on our summer milk Delays in achieving this are inevitable for one thing, as a speaker in the discussion pointed out, we shall have to help in repopulating Europe with cattle after the war But we already have the knowledge and means to increase the present yield of milk per cow, Professor Kay believes from the 520–550 gallons of the prewar years (now down to about 460) to 700–750 gallons Moreover, by control of sterility and other diseases it should be possible to raise the average milking life of a cow from 4 lactations to 6 or 7, and the total yield in some cases to the ideal 5000 gallons The 700 gallon cow is of course more economical than her 500 gallon sister, for although she needs 13% more total food energy and 20% more protein she gives 40% more milk One way to feed her, he pointed out, is to grow better quality protein rich foods for her at home , and the best of these are good leafy grass during the growing season, hay cut relatively early with as much clover in it as possible, and well made silage of young grass or an oats and pulse mixture The influence of ley farming[1]—arable farming as the chairman, Mr R S Hudson, the Minister of Agriculture, called it—on milk production was thus evident Sir Merrick Burrell, chairman of the Agricultural Research Council, pointed out that a farmer takes his hay and turns the animals in to eat the aftermath, and this may go on year after year draining the land of lime and phosphates until the grass is impoverished, parasites increase and infections are spread among the cattle By ploughing up grassland, growing other crops, putting back the lime and phosphate lost in the milk, and reseeding with grass and clover the farmer gets healthier land and healthier cows, and the country gets better milk and a healthier population At present bovine diseases, Professor Kay said, put a gratuitous tax of 25% on the economic cost of every gallon of milk Tuberculosis and contagious abortion need never be conveyed to man if the milk is properly pasteurised but they can ruin a first class herd unless they are recognised early and checked He looks forward to national veterinary health insurance and a state system of preventive veterinary medicine, and he hopes much from the voluntary plan for cooperation between farmers, veterinarians and the Ministry of Agriculture, sponsored by the National Veterinary Medical Association

HEREDITY OF PSYCHONEUROSES

WHETHER neurotic illness is wholly psychogenic or partly hereditary and constitutional has been a controversial topic, on which a hundredweight of argument was often thrown into the scale, but seldom an ounce of good direct study of hereditary influence At a meeting of the section of psychiatry of the Royal Society of medicine on May 19, Dr Felix Brown did much to redress the balance After surveying briefly the pitfalls and defining his diagnostic terms, he described how he had taken 104 patients—63 of them suffering from an anxiety state, 21 from hysteria and 20 from obsessional disorder —and had personally inquired into the mental health of their 2500 first and second degree relatives , 500 of these were actually interviewed With these families were compared those of 31 patients who were in hospital because of physical disease There was no significant difference between the incidence of mental abnormalities in parents of the patients with an anxiety state and those of the " control " group, though in the former there were more mothers than fathers exhibiting an anxiety state , the fathers were more often alcoholic, epileptic or insane than the mothers Whereas 80% of the parents of the control group were mentally normal this was true of only 47% of the parents of the anxiety group, 40% of the parents of hysterics and 50% of the parents of obsessionals , 71% of the parents of the last group had manic depressive disorder Similarly, among the brothers and sisters of the control group, 89% were mentally normal, whereas for anxiety states the corresponding figure was 61%, and for obsessionals 64% though for the hysterics it was 80% Anxiety state tended to be abnormally frequent among the siblings of the patients with anxiety state, and obsessional disorder likewise in the obsessional group The patient's grandparents showed similar features, having fewer *normal people among them than the control grand* parents, and with a higher incidence of grandparents with anxious personality in the anxiety and the obsessional groups than in the control group Uncles and aunts were in this respect like grandparents, and showed also an undue frequency of depressive illness in both the anxiety and the obsessional groups All first degree relatives, taken together, showed a higher frequency of the same mental illness as the respective patient propositi than could be found for the control group Dr Brown subjoined a group of 30 neurotic soldiers, sailors and airmen whom he had investigated during the course of his ordinary work he had found a relatively high incidence of abnormality, especially depression, in the parents He also reported some discordant *twins (including three like sex pairs) of whom the most* interesting were two girls, extremely alike in appearance but different in their finger prints and in their temperaments

Dr Brown concluded that the hereditary factor was unlikely to be recessive, since there had been only one case of consanguineous parents, or to be a simple dominant He suggested that psychoneuroses could occur by a shuffling of the factors responsible for normal personality, and that these, at any rate, might be more important determinants than any hypothetical specific neurotic factor Finally he pointed out that the neurotic illnesses he had studied had developed during peace time, when stresses were less acute and extraordinary than in war, and that the endogenous element was therefore likely to be more conspicuous

---

THE Medical Research Council have issued a report (Special Report Series No 243 H M S O , 10*s* 6*d*) on the investigation of chronic pulmonary disease in coal miners, with particular reference to South Wales which they were asked to undertake in 1936 It comprises a section by the committee on industrial pulmonary disease, a medical survey by Drs P D'Arcy Hart and E A Aslet, and a pathological report by Drs T H Belt and A A Ferris

Dr CYRIL BANKS, medical officer of health for the city of Nottingham, has been elected president of the Society of Medical Officers of Health in succession to Sir Alexander Macgregor whose year of office ends on Sept 30

THE next session of the General Medical Council will open on Tuesday, June 2, at 2 P M , when the president, Mr H L EASON, will deliver an address

FROM May 28 the address of the Medical Defence Union Ltd will be as before 49, Bedford Square, London, W C 1 Tel MUSeum 1337 for dealing with them There was ready acceptance of the suggestion that the medical profession must in this matter be ready for "dilution" in the sense of delegating to people specially chosen certain simple routine health measures, and a realisation that when industrial medicine is finally organised it can only be as part of a service providing for every environmental aspect of the workers' health The Labour Research Department, it was announced, has set up an industrial health section which is prepared to advise on factory health problems and to answer questions sent in

---

[1] See *Lancet*, 1912, i 629

THE FUTURE OF THE POPULATION

BEFORE the war the Registrar-Generals of England and Wales and Scotland submitted a memorandum on the current trend of the population in Great Britain to the Royal Commission on the Geographical Distribution of the Industrial Population It was not included in the papers published by the commission but in view of public interest in the subject has now been issued[1] Its authors, as might be expected with an official publication, are not much interested in what they call "sensational illustrations of what might be the fate of the population 100 or more years hence," and more cautiously confine themselves to the next thirty years Over that period the general form of the population can be foreseen and much of it is already largely determined —or was before the war which may well confound even short-term predictions

The present age-structure of the population is of course, a function of the forces of birth, death and migration during the last century Between 1876 and 1914 births were more than a million per annum, the subsequent decline has reduced them to some 700,000 Persons born in the earlier period were, in the years before the war, aged (roughly) 25–65 so that the middle years of life were (and still are) exceptionally weighted in comparison with the old and the young They are the survivors of the previous high birth-rate and even if they were not reproducing themselves could, in conjunction with prevailing mortality-rates, produce sufficient babies to prevent any immediate fall in the population This, in fact, is what has happened. The population has never yet shown a decrease, nor even a slackening rate of increase to denote the approaching of its peak, and yet since 1923 the birth-rate has been some 25% insufficient to maintain a stationary population The wave produced by the high birth-rate of the last century is passing on and there is insufficient to replace it *If* the yearly quota of births could be kept at the prewar figure of 700,000 then, the memorandum shows, a stationary population of 42½ millions would ultimately be reached at present rates of mortality and 47½ millions if the further decreases in mortality are reasonably anticipated Neither differs appreciably from the actual population of 46 millions in 1937 though they would include considerably fewer persons at ages 15–45 and considerably more at 65 and over But to achieve such a result implies a substantial rise in fertility over the next 20 to 30 years, for the 700,000 births will have to come from a smaller number of women in the reproductive ages than there are today Many hold that such a change is unlikely to come of itself and that a national population policy must be formulated

Without any such action, and ignoring cataclysms, the most likely course, according to the calculations made here, is for the population to rise to a maximum of 47–48 millions during 1951–61 with subsequent decreases on an increasing scale In place of the 700,000 births required annually there would be but 640 000 by 1951 and 570,000 by 1961 That, put soberly and carefully in this report, is the case for action While many causes may underlie the fall in fertility of the past half century there may well be counteracting influences —whether they be economic biological, or a right sense of values—capable of raising it again We should do well to look to them if we wish to avoid a decline in numbers within the next half century

---

[1] Cmd 6358 H M S O Pp 12 2*d*

LONDON AND COUNTIES MEDICAL PROTECTION SOCIETY —The annual general meeting of this society will be held at Victory House, Leicester Square, W C 2, on Wednesday, June 3, at 3 30 P M

In England Now

A Running Commentary by Peripatetic Correspondents

I HAD a most peaceful journey, was enchanted with South Africa, but spent the time mainly in Durban I had 10 days in India, which was of supreme interest From Rangoon, I drove a new American lorry 1800 miles to Kweiyang, one of the main cities of Free China The Burma road was indescribably wonderful and the people met and places visited would fill volumes if adequately described Kweiyang is capital city of Kweichow province Three years ago this province with its 12,000,000 inhabitants hadn't got 12 properly qualified doctors altogether Today the city of Kweiyang has three medical schools, several hospitals and a large Red Cross organisation for supplying the medical needs of Free China This is all due to the war and is one of the benefits brought to backward districts which would not have come for ages in peace-time Beyond Kweiyang I had to travel, more or less alone, across about 1200 miles of China to this city of Kanhsien in Kiangsi province With a most elementary knowledge of the language this presented some difficulties! The journey was accomplished on, first, a charcoal-burning truck, this form of fuel being easily obtained where petrol costs a small fortune Then a surprisingly luxurious express train carried me across several provinces The last 150 miles was done in a public bus This was in fact a sort of primitive horse-box almost without windows and quite without seats We were only 6 hours late starting and the only major misfortune which overtook us on the run was the complete disintegration of one chassis spring This disaster was evidently anticipated because, to my amazement, we were carrying a spare spring We were only about 24 hours late in arrival

So here I am at the end of February in Kanhsien It is a large and busy city surrounded by a colossal and very ancient wall with great massive gates It is of no military interest, but has been bombed several times In fact I walked through ruined streets on arrival and it made one feel quite at home—heaps of rubble look just the same in China as they do in England My hospital is really a military one, but it takes in civilian air-raid cases I had been warned that conditions would be very makeshift, someone said it would be reminiscent of medical services in the Crimean war This isn't really a helpful comparison, but it prepared me for almost anything What I found was a large disused temple—Chinese religion has had its day, and the country is full of temples for which no-one has any more use This one has been adapted to take about 100 beds There were half a dozen victims from a recent raid—compound fractures and so on Then there were about 60 military cases The patients sleep on iron bedsteads and get good feeding, at least far better than what they get in some of their homes or in some military establishments There's an operating theatre which is rather homemade, but usable With the instruments I brought we have quite a reasonable collection Some things, such as head instruments, are conspicuously absent, but one can do ordinary orthopædic and abdominal operating here Things we haven't got are (1) any X-ray apparatus at all, for it has been long on its way and has not yet arrived, (2) an orthopædic table, (3) oxygen, CO_2 or gas in cylinders, (4) any facilities for bacteriology, (5) a cystoscope As regards X rays its just too bad, one has to rely on one's own judgment as to whether there's a sequestrum there or not! We are getting a Chinese carpenter to make us an orthopædic table before the next air-raid, we hope We use spinals or local anæsthesia wherever possible The only spinal available is 10% procaine, which up to now has given quite satisfactory results We prepare it ourselves A nurse gives chloroform and ether

In charge of the hospital I found a Chinese girl She has been qualified about a year and is very keen and industrious and an altogether charming colleague As a race the Chinese have a way of looking juvenile and Miss Chao is no exception Two male Chinese doctors were away It seemed rather a shame for one diminutive lady doctor to be in sole charge of a military hospital The other two have now come back Dr Pan is also very young Like Dr Chao he speaks good English and is a differentiated from the head louse in consequence of a change of habit in its host which provided it with new environment, but it has become differentiated by obvious adaptations to its new environment Its habits, form, functions and structure have become modified in accordance with its need to cling to and live upon the textiles employed in clothing rather than upon the body hairs of its host To the filaments of such textiles it clings even when it is sucking its host's blood among the fibres of this textile it lays its eggs, which are not attached to its host's hairs as are the "nits" of its parent form To attain these ends it has become modified—modified to such an extent that systematists who knew not of its origin deemed it to be a species distinct from its ancestral form, the head louse I do not know if anyone has especially concerned himself with the genes of *P humanus*, nor do I greatly care, for to me it seems clear that here we have a species in the making In the making of this species I can see no more than the response of a louse to a change in its environment It is even possible to date the change in the environment and so gain some index of the length of time taken in nature's experiment, for we have some knowledge of the origin of human clothing

The greatest lesson that is to be learned from the louse *is still untold Lice in general are morphologically* adapted to their environment, their outward form and body shape are in harmony with the demands created by the density and texture of hair or fur or feather They are broad or elongated in shape as the density of their medium varies, their claws are wide or narrow as the hairs they grasp vary in thickness The body louse has modified its form it differs in certain characters from its ancestor the hair-dwelling head louse "Head lice may be found infesting the body, but body lice are never found infesting the head" There is no return in evolution The body louse has modified its ancestral form for the purpose of living on clothing—it cannot revert to its ancestral form adapted to dwelling among the hairs of the scalp Dollo was right when he enunciated his "law of the irreversibility of evolution" Though the head louse may disport itself upon the body, the body louse has lost its adaptations for dwelling among the hairs of the head

---

HEALTH OF THE WAR WORKER

THE *forty million working weeks estimated to be lost* to British industry through sickness every year, representing as it does a loss of thousands of tanks and planes, is certainly a subject on which there should be a sense of urgency But it will take more than that realisation to reduce the figure, as Prof J A RYLE told a conference on the subject at the Conway Hall in London on May 16 It will take active cooperation between doctors and workers, which will only be fully possible if preceded by deeper understanding of the problems involved The conference was called by the Labour Research Department in conjunction with the Socialist Medical Association and was attended by over five hundred people, mainly delegates from trade unions but with many doctors and welfare workers

Dr T O GARLAND opened the meeting with a plea for an immediate drive to aid production by the reduction of sickness and accidents Industrial casualties, he said, are at this stage of the war almost as important as military casualties but the problem is not being tackled by employers and the Government as it might The accident-rate has been rising, probably because new entrants into industry, women and youths alike, are not getting sufficient preliminary training Absenteeism is undoubtedly aggravated by those factors which affect health—lack of ventilation, bad or absent canteen facilities, poor transport and hours of work much longer than the optimum Dr Garland saw two ways, complementary to each other, in which the matter could be tackled More medical men are needed in industry and not enough use is being made of the power to direct doctors into factories or to reserve those who are already in industrial posts Greater use could be made of partly trained personnel, nurses, welfare workers and men and women chosen by the workers themselves Trade unionists and shop stewards must take responsibility for their own health, know what the legal provisions are and see that they are applied Much of the health protection in a factory depends on common application of simple health rules as to ventil lighting, and above all cleanliness In shell factories, for example, cleanliness is essential to prevention of TNT poisoning, but it must be made and rigorously applied The complacency of ou and others who claim to be satisfied because the po is better than in the last war cannot be too condemned This is like comparing the output of now with the last war, since experience has shown TNT poisoning can be completely prevented nothing short of that should be tolerated

This vigorous attitude was echoed by the chairman of the meeting, Mr JACK TANNER, president of the Amalgamated Engineering Union, in starting the discussion in which workers representing many industries took part Mr Tanner declared that we need a new health policy which will not aim merely at keeping enough workers sufficiently well to avoid too serious a drop in production but will see that every worker is on top of the job, able to make the maximum effort to get the war finished in the shortest time But this health policy must consider all that affects health, most particularly nutrition and factors, such as bad transport, which produce fatigue before a worker reaches the factory *The theme of all the speakers who followed* him was that the workpeople are ready to join the doctors in a positive health drive but cannot do so as long as the medical men employed in factories are appointed by the employers and lay themselves open to the suspicion of being "yes-men" to the employers The workers would like to see in industry doctors who would be prepared to cooperate with the employees in forcing on reluctant employers health measures they thought essential Some of the speakers had evidently made a long study of the subject, and a Yorkshire miner impressed the audience with an analysis of the accident-rate among young people forced to work at high pressure before they had acquired the machine complex and become accustomed to the workshop atmosphere This point was emphasised from the medical angle by Miss GLADYS SANDES, of the Medical Women's Federation, who pointed out that while women may have worked hard at home for many years they often find the monotony of factory work exceedingly fatiguing

Professor RYLE was warmly cheered when he declared that plans for a real industrial health service must be made now and put into operation at the earliest moment, and that never before has there been such strong advocacy of a planned independent medical service in which doctors would be able to tackle health in industry in its fundamental aspects The switch from curative to preventive medicine which is now taking place brings all health problems connected with industry very prominently before the medical profession The conference also welcomed his emphasis on the need for research into unsolved problems but even more for the application of the knowledge we have, on fatigue, optimum hours of work, nutrition and so on

Among the particular problems mentioned over and over again were ventilation in blacked-out factories, bad canteen arrangements and the failure of those responsible to understand that production is completely dependent on the maintenance of health The need for investigations into the causes of absenteeism, and for better rates of compensation and payment during sickness were among other points raised There was a general feeling that women suffer more than men from night-work and that the higher sickness and absentee rates among night-workers could be reduced by paying more attention to feeding arrangements Workers cannot maintain health on food cooked during the day and heated up at midnight, especially if it is poor in quality or quantity, for it is really their main meal of the day

Dr Garland had opened his address with a plea that whatever the conditions of the particular factory in which those who spoke in the discussion worked they should refrain from making this a "grousing" meeting, and there was no disposition to make it other than a practical contribution to speeding up the war effort by working out methods for improving and maintaining health There was general agreement that the workers must themselves find out what are the particular defects in their own factories and what methods already exist

Obituary

HAROLD ANTOINE DES VŒUX

M D BRUX, M R C S, L S A

Dr Des Vœux's long and useful life closed on May 20 at his beautiful home on the edge of the New Forest to which he had retired after giving up an extensive West End practice Of French descent (the family name was de Bacquencourt) and Irish blood he was educated at Wellington and St George's from which he qualified in 1883 having made lifelong friends After resident posts at St George's and West London he soon started a practice in Westminster which grew and grew, and his rooms in Buckingham Gate became the rendezvous of many distinguished people who came to rely on his diagnostic ability and his wise guidance Evenings he was apt to spend at medical societies and for long he was treasurer of the Medical Society of London It was presumably this double confidence that led to his success in the last war as treasurer of the relief fund for Belgian doctors and pharmacists when a sum of £25,000 was raised largely from British and Dominion ctors, and so wisely spent as to leave some over for habilitation after the armistice His other considerle public work was as devoted but less productive immediate results The gloom of the dirty London always peeved him and he was the driving force gain as treasurer) of the Coal Smoke Abatement ociety Just thirty years ago now was the all-in nference, with the support of Napier Shaw, S A aser, J B Cohen Bailie W Smith and J S Owens, hich made atmospheric pollution a great national ue Lately he had seen something of its results is death is a personal loss to this journal, for he was ne of Squire Sprigge's intimate circle and his work ften brought him to this office

RICHARD KING BROWN

M D R U I, D P H

Dr King Brown, who died on April 28 at Goring-bya in his 79th year, was a many-sided man His father as the Rev Samuel Edgar Brown, who was at that time resbyterian minister at Lisburn, co Antrim, and well nown as a mathematician and classical scholar Richard was himself educated for the Church From Coleraine he went to Queen's University, Belfast, where he took his B A degree and then accompanied an invalid uncle to Australia On his return he decided on a medical career, re-entered Queen's as a medical student and qualified in 1891 He also represented the university at rugby football After practising for a few months at Ligoniel, Belfast, in 1892 he married Sarah Elizabeth Smith, an American nurse at the Royal Hospital, Armagh, where he had been resident, and migrated to London as assistant to Dr C H Hartt, physician to the Miller Hospital and MOH for Greenwich King Brown took his D P H in 1894 and in 1898 went into practice on his own in the Old Kent Road In 1901 he was appointed MOH for Bermondsey and the next 23 years were busy in improving the lot of the 29,234 families (the 1928 figure) in the borough, most of whose breadwinners were tied to the Thames shore by the casual nature of their work Some 3000 of these families, he found, were living in one room and he was happy in getting ten acres cleared for municipal houses, whose accommodation he insisted should be exactly suited to their needs He established a municipal dental surgery and made fame over a solarium based on the experience of Otto Bernhard of St Moritz, a pioneer of heliotherapy, whose book on light treatment in surgery he translated into English; and he induced his borough to reserve six beds at Leysin for the treatment of children with surgical tubercle For many years he was secretary of the New Cross Medical Society After his retirement King Brown maintained his interest in physical methods and was for several years medical editor of the *British Journal of Physical Medicine* He also translated Schliephake's book on short-wave therapy Shortly before the war ill health led him to the south coast He leaves his widow with one unmarried daughter His only son is in practice in Peckham with charge of several municipal anti-diphtheria clinics A grandson has just qualified from St Thomas's and a grand-daughter is a masseuse at Guy's

Lafayette

THOMAS OLIVER

KT, M D GLASG, D C L DURH, F R C P.

Sir Thomas Oliver who died at Newcastle-on-Tyne on May 15, was well known in the North of England as a consulting physician and over the rest of the world as a specialist in industrial medicine Three years ago at the age of 86 he underwent a thigh amputation, but he made a gallant recovery, even experimenting with an artificial limb, till a few months past when he began to fail

Oliver was born at St Quivox, and was educated at Ayr Academy and the University of Glasgow, where he qualified in 1874 After postgraduate study in Paris, the beginning of a long and fruitful association with the Continent, he set up in practice in Preston in 1875 Four years later he moved to Newcastle where he quickly won recognition as a consultant and was appointed to the staff of the Royal Victoria Infirmary. In those days follow-up departments were unheard of, but Oliver insisted on knowing what happened to his cases and pursued his patients to the outpatient department, the operating-theatre—where he showed an inquiring interest in technique—or, if need be, to the post-mortem room At this time the King Edward VII bridge was being built at Newcastle and there were many industries in the district including factories for the production of white lead As a result Oliver saw many cases of plumbism and caisson disease, and realised the need to counter the hazards of industry by the application of scientific principles He had joined the staff of the College of Medicine of Durham University as lecturer in practical physiology in 1881, and in 1889 he was appointed to the chair This work fitted in well with his ever growing interest in industrial medicine, for he associated physiology with clinical medicine to the enlightenment of his students and the furtherance of his research When he succeeded to the chair of medicine in 1911 he continued to make the institutes of medicine memorable for those he taught

Meanwhile his work as an industrial expert was growing He became Home Office expert on dangerous trades, a member of the 1892 White Lead Commission and of the special inquiry on lucifer matches and the potteries, while constant visits abroad to salt mines, phosphorus works or tunnel constructions where hookworm abounded gave him scope for useful work which was acknowledged with friendship and honours The University of Danzig made him an hon D Sc, France awarded him the gold medal of public assistance and made him chevalier of the legion of honour, Brussels gave him a medal of honour, Boston, Mass made him a freeman, and his own country gave him the accolade At the age of sixty he had retired with regret from appointments which he had enjoyed, but his plans were ready for new work He was a dignified and attentive president of the Durham College of Medicine from 1926–34 From 1928–30 he was vice-chancellor of the university, and in 1931 at Geneva he was hon president of the International Congress of Accidents and Industrial Diseases

During the last war Oliver with the help of a local committee raised the Tyneside Scottish Brigade of which he became honorary colonel He was deputy lieutenant of Northumberland and on the commission of peace for most agreeable colleague I cannot help feeling that these two are romantically associated They seem an ideal pair ! They both lack surgical experience and have not their fair share of surgical courage Then there is a rather comic chap, named Dr Un, in charge He speaks practically no English and has no real qualification in a Western sense Then there are about six nurses, two being well trained The others look about twelve years old, but are keen and work hard and understand more or less about sterility There are no night nurses There hasn't been a surgeon here for a long time, so I found a lot of things waiting for me For example, a man with a simple fistula in ano had been having dressings applied for 14 weeks ! When there was an air-raid two foreign doctors in the town came in and operated, but they have no official position here Surgically I do as I like and have started working systematically through the inmates

There's no organised transport for military wounded in this part of the world, but it's amazing what cases do survive We have a man now who had a bullet wound through the abdomen, the entrance being near the umbilicus and the exit in the middle of the sacrum Both wounds are healed and symptomless He is here because of the persistent sinus from a subphrenic abscess So the surgery I get here is chronic Of 60 soldiers here at the moment three-quarters have sinuses, fistulæ or ulcers—i e , unhealed wounds of one sort or another Without X rays one has to decide which sinuses to explore Personally I take a radical view of the situation and am going through the list pretty thoroughly Yesterday I opened up the tarsus in a man with a fixed ankle and three discharging sinuses You amputate as a last resource in China This man had nine operations in military hospitals in 3 years I thought there was no point in beating about the bush and I made a decent opening and came on a large piece of shell-casing The man is hugely elated and extravagantly flattering in what he says about his tenth and I hope last operation Many of them are simply crying out to be operated on One poor wretch who is most anxious for surgical treatment has a bullet wound from the urethra through the rectum and out in the lower sacral region. I mean to do a suprapubic cystotomy next week and then try to close his perineal and sacral fistulæ Another has a small bullet wound in one parietal region and a hemiplegia on the other side There is no evidence of the bullet having ever come out One wonders whether in the absence of X rays exploration is justified I rather think it is And so it goes on We do three operating lists a week At this rate the clinical material won't last long Personally I hope we shall be able to make this place a sort of centre into which to move cases needing surgery from a series of military hospitals scattered about the province Some of these have completely amateur staffs, who do no surgery at all Later I have plans for making a tour of the fighting zone in north Kiangsi and seeing if one cannot collect some really fresh cases This would be great fun

A dollar is worth *3d* M&B 693 costs 6 dollars a tablet NAB 0 3 g ampoules are sold for 80 dollars each If I'd brought a suitcase full of NAB I should be a millionaire by now.

* * *

" Plague Year," by Anthony Weymouth (London Harrap and Co Pp 246 *10s 6d*) is the diary by a BBC official for the year ending Feb 28, 1941 His job is to arrange, censor and take part in talks, and the book is like one of them—quite interesting, rather drawing-room and drab, with an occasional modulated sparkle He is also a doctor, but he doesn't know what a " conditioned reflex " is (p 172) The blurb on the cover says that the historian in the future will &c , but this putative person, who may even now have attained molecular status in the germplasm of sixteen of us, when he sees all the books that he ought to read may wish he had never been assembled I last read Defoe on the plague of London as a holiday task over thirty years ago and the grim pictures that it conjured in my mind are still there Although this book deals with as exciting a time it gives only faint impressions Why ? Probably because the author was a tired man when he wrote his diary The last words, in big print, are, IT MUST NEVER HAPPEN AGAIN But it will if we are governed by tired men If we want to be ruled by sanity with a kick in it we should send the future world parliament to deliberate on one of the remoter Hawaiian islands There, instead of having informal discussions in stuffy hotels, they can have them lying near each other on surf-boards (" About this Siborgian question, old man, I think Here's beauty coming, look out " Bubble, bubble) or l about on the beach Then at sundown they can come and dress for dinner, coconut oil and lava-lavas Afterwards, fanned by the trade winds, under the stars of both hemispheres, they can hold high debate But not f more than three hours, closure at ten o'clock sh And anybody who mentions the Siborgian question after that shall be de-lava-lavaed

* * *

An article I was reading the other day reminded me of old Tommy Churton He was a dear old man but his clerks used to complain that when doing his round he seldom got past the first case There was a story (se non è vero, e ben trovato) that having been called in for consultation by a busy GP he began to put into practice his usual meticulous methods The GP, having a long visiting-list, grew restive and eventually suggested that he would leave the professor to his investigations and communicate with him later by telephone Reaching home some hours later he found a note from the patient which read " For Heaven's sake fetch this man away ! " Rumour had it that when last seen the professor, armed with a tallow dip, was descending into the nether regions of the patient's house to investigate the drainage system. One cannot help feeling that such methods, like the lives of certain saints, are proposed for our admiration rather than our imitation Although a physician Churton was very interested in surgery, and rumour said that he once let his pince-nez drop into one of Mayo Robson's abdomens, thereby enabling that eminent surgeon, when he published the case, to attribute the patient's death to septic peritonitis—a variant from his favourite formula of ether bronchitis

* * *

I yield to no man in my dislike of small children They are always wanting to be read to, shown pictures, sung to, shod or unshod, unbuttoned and buttoned up again, conversed with, carried on shoulders or lifted on to and jumped down from high places , worst of all, they keep asking questions to which I don't know the answers On my half-holiday (ha ha) I sometimes chop or split wood not because I enjoy doing so but because (*a*) the wood is there to be chopped or split and (*b*) my wife says it is my job to chop or split it and her decision is as final as any editor's It will be thus understood that I find it doubly exasperating to be called upon to chop or split wood with a couple of very small boys hanging around as audience One or other or both of them repeatedly contrive to get in the way just as with appalling vigour and ferocity I am bringing down the axe, and I wonder whether I am going to cleave through a little skull—were I to do so I doubt if the immediate satisfaction obtained would make up for the subsequent unpleasantness. Today's wood was particularly unyielding First I tried chopping it but the axe just glanced off. Single-handed I tried the double-handed saw but it pinched Lastly I had recourse to the beetle and wedge (" biddle and wodge " as we call them in these parts) but the wedge bounced out every time I struck it All this time I was subjected to a running fire of questions and commentary from the audience (" What you goin' to do now ? " " You can't do it, can you ? " " It won't saw, will it ? " " You can't break it, can you ? ") It was a great relief when I broke the handle of the beetle and was able to call it a day even though it did mean yet another rendering of those infernal nursery rhymes

* * *

I read in pharmacology that alcohol is an anæsthetic, but I never realised how good it was till the Swiss was brought in He had been under a bus for half an hour, and his left femur was comminuted They had needed the fire brigade to extricate him But he lay there, dressed in many layers of clothing, and demanded to be allowed to walk home Long before the houseman had given him morphia or the morphia had taken effect he was waving his squashed thigh in the air , it crepitated horribly as we held it down, " Let me go home," he said " I want to go home I can walk fine " He was just pleasantly drunk, just in the stage of confidence and golden visions Later he became petulant He had to go home The heat cradle was a nuisance he wanted to turn over " If I do not turn over," he said with dignity, " I shall die " And so saying, like an irritable child— died

Obituary

HAROLD ANTOINE DES VŒUX

M D BRUX M R C S, L S A

Dr Des Vœux's long and useful life closed on May 20 at his beautiful home on the edge of the New Forest to which he had retired after giving up an extensive West End practice Of French descent (the family name was de Bacquencourt) and Irish blood he was educated at Wellington and St George's from which he qualified in 1883 having made lifelong friends After resident posts at St George's and West London he soon started a practice in Westminster which grew and grew, and his rooms in Buckingham Gate became the rendezvous of many distinguished people who came to rely on his diagnostic ability and his wise guidance Evenings he was apt to spend at medical societies and for long he was treasurer of the Medical Society of London It was presumably this double confidence that led to his success in the last war as treasurer of the relief fund for elgian doctors and pharmacists when a sum of 25,000 was raised, largely from British and Dominion octors, and so wisely spent as to leave some over for ehabilitation after the armistice His other considerble public work was as devoted but less productive f immediate results The gloom of the dirty London ky always peeved him and he was the driving force again as treasurer) of the Coal Smoke Abatement ociety Just thirty years ago now was the all-in onference, with the support of Napier Shaw, S A asey, J B Cohen, Bailie W Smith and J S Owens, hich made atmospheric pollution a great national sue Lately he had seen something of its results His death is a personal loss to this journal, for he was ne of Squire Sprigge's intimate circle and his work ften brought him to this office

RICHARD KING BROWN

M D R U I, D P H

Dr King Brown, who died on April 28 at Goring-by-Sea in his 79th year, was a many-sided man His father was the Rev Samuel Edgar Brown, who was at that time presbyterian minister at Lisburn, co Antrim, and well known as a mathematician and classical scholar Richard was himself educated for the Church From Coleraine he went to Queen's University, Belfast, where he took his B A degree and then accompanied an invalid uncle to Australia On his return he decided on a medical career, re-entered Queen's as a medical student and qualified in 1891 He also represented the university at rugby football After practising for a few months at Ligoniel, Belfast, in 1892 he married Sarah Elizabeth Smith, an American nurse at the Royal Hospital, Armagh, where he had been resident, and migrated to London as assistant to Dr C H Hartt, physician to the Miller Hospital and MOH for Greenwich King Brown took his D P H in 1894 and in 1898 went into practice on his own in the Old Kent Road In 1901 he was appointed MOH for Bermondsey and the next 23 years were busy in improving the lot of the 29,234 families (the 1928 figure) in the borough, most of whose breadwinners were tied to the Thames shore by the casual nature of their work Some 3000 of these families, he found, were living in one room and he was happy in getting ten acres cleared for municipal houses, whose accommodation he insisted should be exactly suited to their needs He established a municipal dental surgery and made fame over a solarium based on the experience of Otto Bernhard of St Moritz, a pioneer of heliotherapy, whose book on light treatment in surgery he translated into English, and he induced his borough to reserve six beds at Leysin for the treatment of children with surgical tubercle For many years he was secretary of the New Cross Medical Society After his retirement King Brown maintained his interest in physical methods and was for several years medical editor of the *British Journal of Physical Medicine* He also translated Schliephake's book on short-wave therapy Shortly before the war ill health led him to the south coast He leaves his widow with one unmarried daughter His only son is in practice in Peckham with charge of several municipal anti-diphtheria clinics A grandson has just qualified from St Thomas's and a grand-daughter is a masseuse at Guy's

Lafayette

THOMAS OLIVER

KT, M D GLASG, D C L DURH, F R C P

Sir Thomas Oliver, who died at Newcastle-on-Tyne on May 15, was well known in the North of England as a consulting physician and over the rest of the world as a specialist in industrial medicine Three years ago at the age of 86 he underwent a thigh amputation, but he made a gallant recovery, even experimenting with an artificial limb, till a few months past when he began to fail

Oliver was born at St Quivox, and was educated at Ayr Academy and the University of Glasgow, where he qualified in 1874 After postgraduate study in Paris, the beginning of a long and fruitful association with the Continent, he set up in practice in Preston in 1875 Four years later he moved to Newcastle where he quickly won recognition as a consultant and was appointed to the staff of the Royal Victoria Infirmary In those days follow-up departments were unheard of, but Oliver insisted on knowing what happened to his cases and pursued his patients to the outpatient department, the operating-theatre—where he showed an inquiring interest in technique—or, if need be, to the post-mortem room At this time the King Edward VII bridge was being built at Newcastle, and there were many industries in the district, including factories for the production of white lead As a result Oliver saw many cases of plumbism and caisson disease, and realised the need to counter the hazards of industry by the application of scientific principles He had joined the staff of the College of Medicine of Durham University as lecturer in practical physiology in 1881, and in 1889 he was appointed to the chair This work fitted in well with his ever growing interest in industrial medicine, for he associated physiology with clinical medicine to the enlightenment of his students and the furtherance of his research When he succeeded to the chair of medicine in 1911 he continued to make the institutes of medicine memorable for those he taught

Meanwhile his work as an industrial expert was growing He became Home Office expert on dangerous trades, a member of the 1892 White Lead Commission, and of the special inquiry on lucifer matches and the potteries, while constant visits abroad to salt mines, phosphorus works or tunnel constructions where hookworm abounded gave him scope for useful work which was acknowledged with friendship and honours The University of Danzig made him an hon D Sc, France awarded him the gold medal of public assistance and made him chevalier of the legion of honour, Brussels gave him a medal of honour, Boston, Mass made him a freeman, and his own country gave him the accolade At the age of sixty he had retired with regret from appointments which he had enjoyed, but his plans were ready for new work He was a dignified and attentive president of the Durham College of Medicine from 1926–34 From 1928–30 he was vice-chancellor of the university, and in 1931 at Geneva he was hon president of the International Congress of Accidents and Industrial Diseases

During the last war Oliver with the help of a local committee raised the Tyneside Scottish Brigade of which he became honorary colonel He was deputy lieutenant of Northumberland and on the commission of peace for most agreeable colleague I cannot help feeling that these two are romantically associated They seem an ideal pair! They both lack surgical experience and have not their fair share of surgical courage Then there is a rather comic chap, named Dr Un, in charge He speaks practically no English and has no real qualification in a Western sense Then there are about six nurses, two being well trained The others look about twelve years old, but are keen and work hard and understand more or less about sterility There are no night nurses There hasn't been a surgeon here for a long time, so I found a lot of things waiting for me For example, a man with a simple fistula in ano had been having dressings applied for 14 weeks! When there was an air-raid two foreign doctors in the town came in and operated, but they have no official position here Surgically I do as I like and have started working systematically through the inmates

There's no organised transport for military wounded in *this part of the world, but it's amazing what cases do* survive We have a man now who had a bullet wound through the abdomen, the entrance being near the umbilicus and the exit in the middle of the sacrum Both wounds are healed and symptomless He is here because of the persistent sinus from a subphrenic abscess So the surgery I get here is chronic Of 60 soldiers here at the moment three-quarters have sinuses, fistulæ or ulcers—i e, unhealed wounds of one sort or another Without X rays one has to decide which sinuses to explore Personally I take a radical view of the situation and am going through the list pretty thoroughly Yesterday I opened up the tarsus in a man with a fixed ankle and three discharging sinuses You amputate as a last resource in China This man had nine operations in military hospitals in 3 years I thought there was no point in beating about the bush and I made a decent opening and came on a large piece of shell-casing The man is hugely elated and extravagantly flattering in what he says about his tenth and I hope last operation Many of them are simply crying out to be operated on One poor wretch who is most anxious for surgical treatment has a bullet wound from the urethra through the rectum and out in the lower sacral region I mean to do a suprapubic cystotomy next week and then try to close his perineal and sacral fistulæ Another has a small bullet wound in one parietal region and a hemiplegia on the other side There is no evidence of the bullet having ever come out One wonders whether in the absence of X rays exploration is justified I rather think it is And so it goes on We do three operating lists a week. At this rate the clinical material won't last long Personally I hope we shall be able to make this place a sort of centre into which to move cases needing surgery from a series of military hospitals scattered about the province Some of these have completely amateur staffs, who do no surgery at all Later I have plans for making a tour of the fighting zone in north Kiangsi and seeing if one cannot collect some really fresh cases This would be great fun

A dollar is worth 3*d* M&B 693 costs 6 dollars a tablet NAB 0 3 g ampoules are sold for 80 dollars each If I'd brought a suitcase full of NAB I should be a millionaire by now.

* * *

"Plague Year," by Anthony Weymouth (London *Harrap and Co Pp 246 10s 6d*) is the diary by a BBC official for the year ending Feb 28, 1941 His job *is to arrange, censor and take part in talks,* and the book is like one of them—quite interesting, rather drawing-room and drab, with an occasional modulated sparkle He is also a doctor, but he doesn't know what a "conditioned reflex" is (p 172) The blurb on the cover says that the historian in the future will &c, but this putative person, who may even now have attained molecular status in the germplasm of sixteen of us, when he sees all the books that he ought to read may wish he had never been assembled I last read Defoe on the plague of London as a holiday task over thirty years ago and the grim pictures that it conjured in my mind are still there Although this book deals with as exciting a time it gives only faint impressions Why? Probably because the author was a tired man when he wrote his diary The last words, in big print, are, IT MUST NEVER HAPPEN AGAIN But it will if we are governed by tired men If we want to be ruled by sanity with a kick in it we should send the future world parliament to deliberate on one of the remoter Hawaiian islands There, instead of having informal discussions in stuffy hotels, they have them lying near each other on surf-boards ("A this Siborgian question, old man, I think Here's beauty coming, look out" Bubble, bubble) or l about on the beach Then at sundown they can come and dress for dinner, coconut oil and lava-lavas A wards, fanned by the trade winds, under the stars of hemispheres, they can hold high debate But not more than three hours, closure at ten o'clock sh And anybody who mentions the Siborgian question a that shall be de-lava-lavaed

* * *

An article I was reading the other day reminded me old Tommy Churton He was a dear old man but clerks used to complain that when doing his round seldom got past the first case There was a story (se i è vero, e ben trovato) that having been called in consultation by a busy GP he began to put into pract his usual meticulous methods The GP, having a l *visiting-list, grew restive and eventually suggested* t he would leave the professor to his investigations a communicate with him later by telephone Reach home some hours later he found a note from the pati which read "For Heaven's sake fetch this man away Rumour had it that when last seen the professor, arm with a tallow dip, was descending into the nether regi of the patient's house to investigate the drainage syste One cannot help feeling that such methods, like the li of certain saints, are proposed for our admiration rat than our imitation Although a physician Churton w very interested in surgery, and rumour said that he o let his pince-nez drop into one of Mayo Robson's ab mens, thereby enabling that eminent surgeon, when published the case, to attribute the patient's death septic peritonitis—a variant from his favourite formula ether bronchitis

* * *

I yield to no man in my dislike of small childr They are always wanting to be read to, shown pictur sung to, shod or unshod, unbuttoned and buttoned again, conversed with, carried on shoulders or lifted to and jumped down from high places, worst of all, th keep asking questions to which I don't know the answe On my half-holiday (ha ha) I sometimes chop or sp wood not because I enjoy doing so but because (*a*) t wood is there to be chopped or split and (*b*) my wife sa it is my job to chop or split it and her decision is as fi as any editor's It will be thus understood that I find doubly exasperating to be called upon to chop or sp wood with a couple of very small boys hanging arou as audience One or other or both of them repeated contrive to get in the way just as with appalling vigo and ferocity I am bringing down the axe, and I wond whether I am going to cleave through a little skull—we I to do so I doubt if the immediate satisfaction obtain would make up for the subsequent unpleasantne Today's wood was particularly unyielding First I tr chopping it but the axe just glanced off Single-hand I tried the double-handed saw but it pinched Lastly had recourse to the beetle and wedge ("biddle a wodge" as we call them in these parts) but the wed bounced out every time I struck it All this time I w subjected to a running fire of questions and commenta from the audience ("What you goin' to do now "You can't do it, can you?" "It won't saw, will it "You can't break it, can you?") It was a great rel when I broke the handle of the beetle and was able to c it a day even though it did mean yet another renderi of those infernal nursery rhymes

* * *

I read in pharmacology that alcohol is an anæsthet but I never realised how good it was till the Swiss w brought in *He had been under a bus for half an ho* and his left femur was comminuted They had needed t fire brigade to extricate him But he lay there, dress in many layers of clothing, and demanded to be allow to walk home Long before the houseman had given hi morphia or the morphia had taken effect he was wavi his squashed thigh in the air, it crepitated horribly we held it down, "Let me go home," he said "I wa to go home I can walk fine" *He was just pleasant* drunk, just in the stage of confidence and golden visio Later he became petulant He had to go home T heat cradle was a nuisance he wanted to turn ove "If I do not turn over," he said with dignity, "I sh die" And so saying, like an irritable child, he died

ON AMPUTATION

TEN COMMANDMENTS*

GORDON GORDON-TAYLOR, C B O B E, M S LOND, F.R.C S; SURGEON REAR-ADMIRAL

THE following "commandments" have suggested themselves as the result of observation of war surgery for nearly three years They are not offered in any spirit of criticism of the work of my splendid colleagues, the surgeons of Great Britain but in the hope that they may add to the number of lives which are saved, and diminish still further the later complications of amputation. The suggestions contained in the commandments are no concern of those who may be charged with the duty of secondary amputation, but may be of value to those who have to undertake a primary or an emergency amputation on an injured man

1 *A second expert opinion should always be sought* where possible, before amputating a limb especially if it be the upper limb which is threatened with removal

2 *Anæsthetic.*—In severe shock, spinal anæsthesia is certain euthanasia. Gas and oxygen is still the anæsthetic which is most likely to promote a successful result in the severely shocked patient or the "desperate adventure."

3 *Tourniquet.*—Apart from its use in first-aid work, the tourniquet is a barbarous mechanism with destructive potentialities. Where competent assistance is available for control of the blood-supply of the limb to be removed avoid a tourniquet altogether. Many years have elapsed since I have employed a tourniquet for a simple amputation.

4 *Remember the long knife and do not be afraid to use it*—The employment of a small scalpel to cut through the muscles and connective-tissue structures of a limb is ill-timed and unworthy bravado! The epic operators of the pre-anæsthetic days, famous by reason of necessity for dazzling speed and brilliant dexterity, paid atention to their surgical cutlery, length of blade and sharpness of steel. Amputation knives were forged and fashioned for a purpose. In the name of Heaven use them!

5 *Nerves and blood-vessels*—Cut through the nerves of the limb with the same circular sweep of the long sharp knife that sections the muscles. Do not add cruelty to your disagreeable task by pulling on, crushing or ligaturing the nerves or injecting them with alcohol If it is possible to ligature separately from the nerve a bleeding artery coursing within the nerve sheath, take pains to do so Every pull or insult to the nerve is an added pain to be borne. Blood-vessels are best ligatured with silk, linen thread or cotton. It is immaterial whether artery and vein are included in the same ligature or whether they are tied separately.

6 *Hurry up!*—The time taken to perform an emergency amputation should be reckoned in minutes and not in hours The surgeon who spends the best part of an hour or more in performing any of the ordinary emergency amputations of war surgery has not only missed his vocation but wastes the time of his assistants, fails in his duty to his patient and penalises the chances of others who are awaiting surgical aid. One's temptation is to use to the surgical dawdler those words which Cromwell addressed to the Long Parliament, and which were employed again on another more recent but memorable occasion: "You have sat too long here for any good you are doing. Depart, I say, and let us have done with you. In the name of God, go!"

7 *Transfixion.*—In the direst emergency, when life is gravely threatened, speed can be further accelerated by transfixion-flaps, and the limb may be removed at the site of the fractured bone. This is a manœuvre only to be employed in the exceptional case, but its utility was proved from personal experience in the last war in the case of men who had been lying out in the shell-holes and the mud of Paschendaele, drinking their own urine. The sobriquet "Telephonic address, Middle Third" given to me by Major-General Sir Charles Gordon-Watson in the last war is one of which I am still proud!

8 *Do not waste further time* by putting a desperate case in plaster-of-paris for other injuries which may complicate a high amputation of the lower limb A Thomas splint can be more rapidly applied and can be replaced by plaster subsequently, if this seems desirable

9 *Hæmostasis*—In a case of severe shock few vessels will require ligature even in an amputation of the thigh but oozing may take place later. It is therefore rarely advisable to suture the flaps closely without drainage; a piece of corrugated rubber drain at each corner for 24 hours will prevent a hæmatoma and certainly does no harm If early transport is probable, it is important not to suture the flaps of an early amputation too closely, and if amputation has been delayed for more than 10 to 12 hours after injury do not perform primary suture of flaps at all

10 *Avoid massage to the stump like the devil*—The patient whose stump is massaged and who does not develop a painful limb must be under the special protection of Heaven

---

[*] Part of a presidential address "Concerning Amputation," delivered to the Medical Society of London on April 27, 1942. Some of the information in this section of the address has already appeared in the M.R.C War Memorandum No 5

CHARCOAL BLANKET FOR DEODORISING DISCHARGES

STANLEY ALSTEAD, M.D LPOOL, M.R.C.P LOND
ROBERT POLLOK LECTURER IN PHARMACOLOGY AND THERAPEUTICS IN THE UNIVERSITY OF GLASGOW ASSISTANT VISITING PHYSICIAN, STOBHILL HOSPITAL, GLASGOW

THE object of this paper is to describe a simple method for minimising the nuisance of offensive smells associated with foul discharges The problem is of major importance in many hospitals especially during the hours of black-out when ventilation is necessarily restricted Thus in cancer hospitals nurses are sometimes nauseated by the stench from the beds of patients suffering from inoperable cancer of the uterus accompanied by foul discharge, and it is significant that these patients rarely have visitors Formalin sprays have a certain deodorant value but their effects are fleeting—merely a few minutes—and it is generally agreed that perfumed preparations make the smell even more sickly Charcoal has been used for a long time as a local dressing for foul ulcers, but there it often fails as a deodorant probably because some of the discharge leaks through the dressing Furthermore, when the discharge is profuse the charcoal dressing must be changed frequently, and this is wasteful and expensive (guaranteed activated charcoal costs about 6s a pound) It was therefore decided to try the effect of a blanket containing charcoal particles After testing various materials it was found that charcoal in a suitable form could be dispersed satisfactorily in hospital wadding (figs 1*a* and *b*). The wadding is a coarse unbleached cotton-wool, light brown in colour; white cotton-wool is much less satisfactory in retaining the charcoal in position.

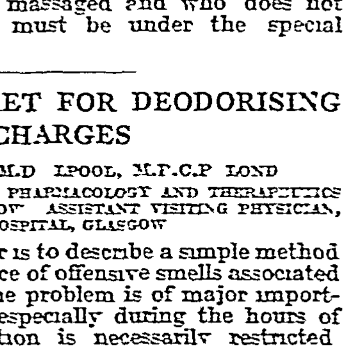


FIG 1—Charcoal blanket in plan (*a*) and section (*b*).

MAKING THE CHARCOAL BLANKET

A piece of finest mesh cotton gauze measuring 6 ft 4 in by 4 ft. 4 in. is spread on a table and pinned down. Next a piece of hospital cotton-wool 6 ft by 4 ft is evenly separated into two equal layers; this is facilitated by previously drying the unrolled cotton-wool in a warm oven or on a radiator, for it swells to twice its usual thickness when dry One of the pieces of cotton-wool is placed in the centre of the gauze, rough surface uppermost, and is uniformly sprinkled with three-quarters of a pound of activated charcoal in the form of coarse grit The cotton-wool is supplied in rolls of varying widths. If necessary narrow strips can be joined by sewing a length of 2 in gauze bandage over the adjacent edges of the cotton-wool strips on their rough surface, this gauze must top, so as to discharge around the jet, a better distribution of the particles throughout the chamber is obtained, and if the outlet pipe instead of being carried out from the side into the dust cyclone separator, were carried out from the centre of the chamber in accordance with my normal practice, then instead of 95% of the powder being carried through into the cyclone and the dust bag, as little as 5% only should be carried forward, the 95% coming down into the main chamber If this design is properly carried out instead of the rather crude method shown, it should be possible to leave the walls free from powder and not have the difficulty of this adhering

Wilkinson and his colleagues state that the plasma solution containing some 4–10% solids does not require precondensation If however, a suitable and up-to-date precondensing system is used, it is advantageous to increase the percentage solids so that the output of the spray drier is correspondingly increased This new method of evaporation should be available for laboratory and general use at an early date

J ARTHUR REAVELL,
Chairman

Kestner Evaporator & Engineering Co Ltd

Medical News

Royal College of Surgeons of England

On Tuesday, June 2, and Wednesday, June 10, at 2 30 P M, Dr John Beattie will speak on the fate of transfused plasma Both lectures will take place at the college, Lincoln's Inn Fields, London, W C 2

Medical Society of London

Sir Robert Kelly will give the annual oration on some experiences of vascular surgery during and after the last war (Monday, June 1, 5 P M, at 11, Chandos Street, W 1)

Biochemical Society

The next meeting will be held in the institute of physiology, the University of Glasgow, on Saturday, June 6, at 11 A M

Medical Honours

The O B E has been awarded to Surgeon Lieutenant D M Armstrong, M B Glasg, R N, and the D S O to prob Temp Surgeon Lieutenant Johnstone Dickie, F R C S E, R N V R

Society of Medical Officers of Health

A meeting of the fever hospital medical services group will be held at the London School of Hygiene, Keppel Street, W C 1, on Friday, June 12, at 3 P M, when Dr E H R Harries will open a discussion on the clinical aspects and control of typhus fever

London Jewish Hospital Medical Society

On Thursday, June 4, at 2 45 P M, Dr P M D'Arcy Hart will open a symposium at BMA House, Tavistock Square, London, W C 1, on tuberculosis with special reference to its problems in war time Dr F J Bentley will deal with public health aspects, Dr C O S Blyth Brooke with clinical and subclinical tuberculosis in adults and Prof Edmund Nobel with childhood tuberculosis

Faculty of Radiologists

The annual meeting of the faculty will be held at the Grand Hotel, Manchester, on June 5 and 6 The diagnostic section will meet at 11 A M on June 5, and the therapy section will hold a clinical demonstration at the Christie Hospital and Holt Radium Institute On June 6 there will be a symposium on the problems of post war reconstruction in radiology at which Prof Geoffrey Jefferson, Prof W V Mayneord, D Sc, Dr C G Teall, Dr H Graham Hodgson, Mr G F Stebbing and Dr Ralston Paterson will take part Further particulars may be had from the secretary of the faculty, 32, Welbeck Street, London, W 1

Dr Melville Mackenzie will open a discussion at the Royal Sanitary Institute on the louse in relation to typhus fever (Wednesday, June 3, at 2 30 P M, at 90, Buckingham Palace Road, S W 1)

Dr G G Kayne will speak to the Association of Austrian Doctors in Great Britain on the rôle of the general practitioner in the control of tuberculosis at 69, Eton Avenue, London, N W 3, on Sunday, June 7, at 11 15 A M

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export

ROYAL MEDICAL BENEVOLENT FUND

THE annual meeting of the fund, held at Sir Thomas Barlow's house in Wimpole Street on May 21, was a typical war-time affair, those who were there were mainly the few who quietly carry on the work during the year Sir Thomas, who presided, was in his usual form No-one can remember when he wasn't Dr L G Glover presenting the accounts said that although the total subscriptions fell short of the high figure of 1938 by nearly £1000 they were £400 up on last year, and it had been a good year for legacies The sum of £22,269 was distributed as against £21,909 in the previous year The small increase in the average grant was, said Dr C O Hawthorne, amply justified by the increased cost of living, it still fell short of what the case committee would like to do if it had the means Reference was made by Sir Arnold Lawson (chairman of business) and by the President to the cordial relations with medical bodies who help on the work, the Medical War Relief Committee has left it to the fund to distribute its periodic grants The President ascribed the success of his Christmas appeal mainly to the help of the medical press Letters from recipients reveal what a difference an odd thirty shillings or so has made in the seasonal outlook The same is true of the funds raised by the Ladies' Guild, largely devoted to comforts and educational needs, which are also up on last year Everybody was agreed that what the fund wants is more regular subscribers, even of small amounts A copy of the accounts is being circulated this year on demand to existing subscribers who will receive a letter from the chairman reminding them that when they remember the fund in their wills they should also remember its precise name to avoid legal difficulties later It may be stated here without unbecoming modesty that a casual glance at a paragraph such as this once brought the fund a legacy of £27,846 The other want, present in the minds of management and case committees, is of new blood to carry on their good work when they are not so young The hon secretary of the fund is Mr R M Handfield-Jones and the address 1, Balliol House, Manorfields, London, S W 15

Births, Marriages and Deaths

BIRTHS

BARRY —On May 21, at Edinburgh, the wife of Captain C T Barry R A M C —a son
BEILBY —On May 20, at Weybridge, the wife of Dr F J Beilby West Byfleet—a son
DUNN —On May 20, at Londonderry, the wife of Dr G Newton Dunn, of Kincardine Salisbury—a daughter
FELL —On May 17, at Colchester, the wife of Captain John Fell, R A M C —a son
FERGUSON —On May 15, at Cardiff, the wife of Major Ian Ferguson, R A M C —a son
NAIRAC —On May 20, the wife of Dr M L Nairac, Kidderminster —a daughter
O'REILLY —On May 20, at Redruth, the wife of Dr Edward O'Reilly, of Chacewater—a son
PHILLIPSON —On May 15, the wife of Major Dick Phillipson, R A M C, of Fleet, Hants—a son
POOLMAN —On May 19, at Ottery St Mary, Devon, the wife of Lieutenant John Poolman R A M C —a son
PORTER —On May 17, at Faversham, the wife of Dr T W Herdman Porter—a son
REES JONES —On May 24, at Newmarket, the wife of Captain G I Rees Jones, R A M C —a daughter
RICHARDSON —On May 12 at Lincoln, the wife of Flying Officer G O Richardson—a son
ROCHE —On May 22, at Cairo, the wife of Lieut Colonel L S C Roche R A M C —a son
RUSBY —On May 15 at Hertford to Dr Elizabeth Rusby (née Broadhead) and Dr Lloyd Rusby—a son
SALAMAN —On May 21 at Stansted, Essex, the wife of Dr Arthur Salaman—a daughter
SQUIRE —On May 16, at Molesey, the wife of Dr John R Squire—a daughter

MARRIAGES

BRAMWELL—BRADFORD —On May 23 at West Coker, near Yeovil John Byrom Bramwell, M B, R A M C, to Daphne Harold Bradford
KERR—TALBOT —On May 9, at Cairo, John Guthrie Kerr, M B, captain R A M C, to Mary Talbot, Q A I M N S

DEATHS

BRAND —On May 20 at Sundridge Shaftesbury Dorset, William Brand B A MANITOBA, M B EDIN, formerly tuberculosis officer for Camberwell
DES VOEUX —On May 20 at Battramsley Close, near Lymington, Hants Harold Antoine Des Voeux, M D BRUX, L R C I, L S A
JAMES —On May 21, Francis Percy Roesch James L R C P I, formerly of Clapham

of thiomethourea and strong caustic soda in tube B To ensure complete and rapid interaction of the reagents, the tube B is immersed in a waterbath (thermos flask) at about 96° C The gas passes to the screen consisting of the piece of charcoal blanket Any methyl mercaptan penetrating the screen is caught in a 0 01% solution of isatin in concentrated sulphuric acid (20 c cm), an amber coloured liquid which turns light green in the presence of methyl mercaptan, deepening to a vivid grass green as the concentration of the gas increases The addition of a water trap A provides a method for checking that the bell jar compartment is airtight The outlet from tube C is connected to a 25 litre bottle which is filled with water and can be used as an aspirator

It was found that when air was aspirated at 40 c cm per min through a mixture containing 10 mg of thiomethourea and 0 2 c cm of 40% sodium hydroxide, sufficient mercaptan was evolved to turn the isatin solution to a medium shade of green within 30 minutes The progress of the reaction was plotted by comparing the colour of the reagent every 5 min with a shade card The graphs (fig 3*a*) show that methyl mercaptan easily penetrates a cotton-wool screen, but when the experiment was repeated under identical conditions except that a cotton-wool screen containing charcoal was used only a small fraction of the gas passed through It can be shown that the efficiency of a charcoal blanket is proportional to the degree of dispersion of the particles in the cotton-wool Charcoal dust is undoubtedly the best for maximum adsorption, but it is unsuitable for blankets because it soon penetrates the cotton-wool and blackens the bedclothes

EFFICIENCY OF CHARCOAL BLANKET IN ADSORBING METHYL MERCAPTAN EVOLVED FROM VARIOUS QUANTITIES OF THIOMETHOUREA

Blanket used	Mg thiomethourea	Smell of meth mercap in—	
		Bed compt	Ward
Control	1 2	+	+
Charcoal	1 2	0	0
Control	3 6	+++	++
Charcoal	3 6	? trace	0
"	4 8	slight	0
	6	+	0

With the coöperation of Messrs Sutcliffe, Speakman and Co Ltd , a number of charcoals of different types and varying mesh were examined, and one having the characters of coarse grit was found to be most suitable, the particles being fine but adhering satisfactorily to the cotton wool Tests were made to find the minimum quantity of this kind of charcoal that would be required to make the blanket (fig 3*b*) These tests were made in the presence of a much higher concentration of gas than would ever occur under clinical conditions, and so it is reasonable to assume that the "minimal effective quantity" (3 g in the screen, equivalent to ¾ lb in a blanket 6 ft by 4 ft) actually represents an excess over actual requirements without adding unduly to the bulk and weight of the blanket The rapid rate of aspiration of the gas through the screen and the high concentration, however, bear little resemblance to clinical conditions Furthermore, the absence of colour change in the isatin solution when using 3 g of charcoal grit in the screen (fig 3*b*) does not necessarily mean that the air passing through had been completely deodorised , small quantities of mercaptan, easily detected by the sense of smell, may leave the chemical indicator unchanged The question still remained Is the charcoal blanket effective in the presence of very low concentrations of mercaptan ?

To investigate this point, an attempt was made to reproduce as closely as possible the conditions which exist clinically By means of special wooden boards and rubber sheets the lower two-thirds of a standard hospital bed was converted into a box-like compartment (fig 4) A thermos flask containing the reagent tube was clamped so as to stand firmly on the middle of the mattress and was separated from the bedclothes only by a large iron tripod Access to the apparatus was gained at the upper end of the compartment, but during an experiment this was closed by a rubber sheet which extended from the roof of the compartment to the lower edge of the pillow It was found that using a cotton-wool blanket (no charcoal) in addition to the ordinary bedclothes the minimum quantity of thiomethourea that gave a definite smell of mercaptan in the bed compartment on lifting up the flap at the foot of the bed after 10 min was 1 2 mg , the air in the ward also had a distinct smell of the gas To facilitate detection of the mercaptan by the sense of smell, observations were made after absence from the ward for 5 and 10 min The table shows that the charcoal blanket was effective in dealing with small quantities and that leakage began only when comparatively large amounts of gas were present Fig 5 shows the contrast between the screening action of the control blanket (cotton-wool only) and the charcoal blanket when the amount of foul gas evolved was at least fifty times as great as is likely to be encountered clinically

DISCUSSION

The charcoal blanket provides a means of surrounding a patient with a barrier of adsorptive material The cotton-wool which acts as a matrix for the charcoal has the additional advantage that it tends to retard the rate of escape of malodorous gases from the interior of the bed, and these relatively static conditions favour complete adsorption It is essential that a guaranteed activated charcoal should be used , many preparations on the market are inert Although the gases which are liberated in the presence of foul discharge are exceedingly offensive, the amount evolved is very small A blanket containing ¾ lb of activated charcoal will therefore last indefinitely The blanket should not be washed but it can be autoclaved as often as is necessary, and the calico fringe can be taken off and laundered It can be shown experimentally that the interposing of a bed sheet between the patient and the charcoal blanket does not affect the adsorptive action appreciably The sheet is, in fact, desirable because it protects the charcoal blanket from excessive wear and tear due to the movements of the patient's limbs The use of the charcoal blanket has practically eliminated smells from patients with offensive discharges, but satisfactory results can be obtained only when all such patients in a ward are provided with the blankets It is not suggested that this method offers a complete solution to the problem A small quantity of gas is bound to escape into the ward during bedmaking and other physical disturbances The effect of this is to produce staleness of the air rather than offensiveness For hospital staffs this is of little importance, but visitors are more susceptible The elimination of these traces of gas from the atmosphere of the ward or bedroom constitutes a problem in air-conditioning, and further investigations are proceeding on these lines

SUMMARY

A method is described for making a charcoal blanket for use as a deodorant in cases of inoperable cancer of the uterus with foul discharge and similar conditions The blanket has been tested clinically and under experimental conditions and its usefulness has been confirmed

I am indebted to Prof Noah Morris and Dr Adam Barr for their interest in this work , Mr David T Gibson, D Sc , of the chemistry department in the University of Glasgow for advice on chemical methods , and Miss J A Nivison and Mr D Graham of Stobhill Hospital for technical assistance

---

CARMICHAEL PRIZES of £150 and £100 will be awarded for the best essays submitted before Feb 1, 1943, on the state of the medical profession in Great Britain and Ireland The president and council of the Royal College of Surgeons in Ireland will judge the essays and further particulars may be had from the registrar of the college, St Stephen's Green, Dublin

CERTIFICATES FOR LACTIC CHEESE —A doctor who was asked by a patient for a certificate to enable her to buy "lactic" cheese is puzzled because the certificate was said to be required by the manufacturers of the cheese It appears that supplies of hard cheese, one of the raw materials from which lactic cheese is made can only be obtained by manufacturers if their application is supported by medical certificates then be covered with a thin layer of cotton-wool to ensure even distribution of the charcoal The remaining piece of cotton-wool (6 ft by 4 ft) is replaced so as to cover the charcoal completely Another piece of cotton gauze (6 ft 4 in by 4 ft 4 in) is then placed on top of the cotton-wool so as to coincide with the lower piece In order to prevent movement of the layers they are tacked together by means of thread here and there before the blanket is lifted off the table and passed through a quilting machine It is essential that this operation should be done with the least possible disturbance, and the charcoal blanket should be held in horizontal by two workers The cotton gauze overlapping the edge of the cotton wool is used to reinforce the material The quilting process divides the blanket into spaces measuring 2 in square and this tends to maintain the uniform distribution of the charcoal grit All round the blanket, except at the upper end, a strip of calico or similar material not less than 12 in wide should be sewn on to the edge of the cotton-wool, when in use, this calico fringe is tucked under the mattress to keep the main part of the blanket in a central position on the bed It is an advantage to insert weights into the upper corners of the cotton-wool These weigh about 2 oz each and are made of scrap lead, they should be fixed in position by means of thread passing through a hole in the centre of the weights Alternatively small packets of sand might be used A broad piece of tape is attached to the upper edge of the cotton-wool over a length of about 18 in , the two ends are long enough to pass round the patient's waist and can be tied in front for greater comfort The object of weighting the upper corners and fixing the blanket at the patient's waist is to minimise the escape of gas from the bed when the patient moves, especially when he sits up Blankets 5 ft wide (excluding the calico fringe) may be necessary for fat patients or when a bed cage is in use The charcoal blanket is applied over the patient's top sheet, but the sheet should be folded at the foot of the bed so that its upper end does not reach beyond the patient's waist Other blankets, bed-cover, &c may be applied over the charcoal blanket according to the patient's requirements

CLINICAL TRIALS

With the cooperation of Miss Nivison of Stobhill Hospital three charcoal blankets were made For control observations another blanket was made, similar in all respects to the others, but containing no charcoal Tests were made on patients suffering from uterine cancer accompanied by foul discharge and on one patient with very offensive syphilitic condylomata In several instances the smell was so strong that patients in adjacent beds had complained of its sickening effect The use of the charcoal blanket invariably resulted in a well-marked lessening of the odour Experienced sisters and nurses gave an immediate assurance that the blankets were remarkably effective, and urged that a sufficient number should be procured to meet the requirements of all the patients needing them The control blanket was occasionally substituted for the charcoal blanket and its uselessness in preventing the penetration of the offensive gases showed that the effectiveness of the deodorant blanket was entirely due to the charcoal contained in it

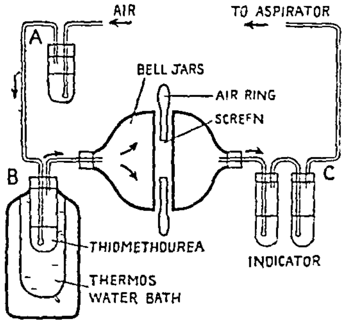


FIG 2—Testing apparatus A, water trap B, tube containing thiomethourea and strong caustic soda, producing methyl mercaptan C, tubes containing the indicator isatin

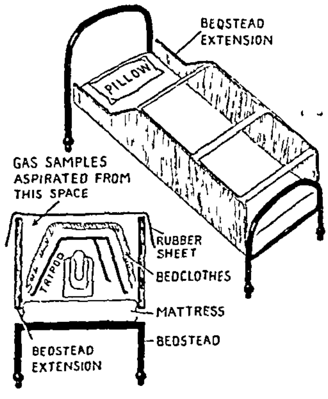


FIG 4—Experimental bed in elevation and cross section

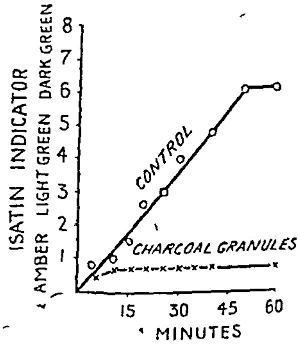


FIG 5—Screening action of control blanket and charcoal blanket using 60 mg of thiomethourea giving a very high concentration of methyl mercaptan

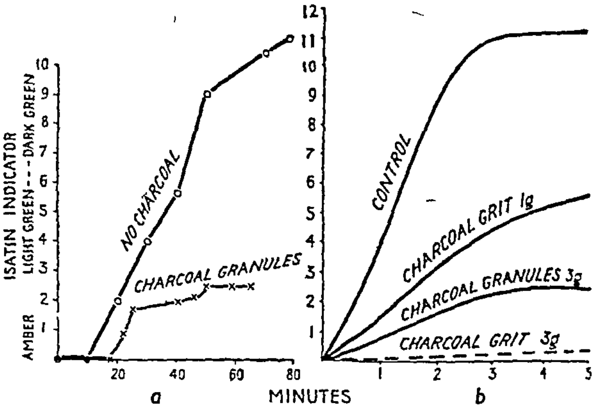


FIG 3—(*a*) Methyl mercaptan penetration of cotton wool screen when containing no charcoal and when containing charcoal granules (*b*) Efficiency of various screens at high concentration of methyl mercaptan.

EXPERIMENTAL WORK

For experimental purposes it was necessary to select a gas suitable for quantitative estimations The products of protein putrefaction have been classified by Alvarez [1] as follows

1 *From the aromatic radicals* —Indol, skatol, phenol, cresol and the pressor bases

2 *From the fatty acid radicals* —Fatty acids, acetone ammonia, cadaverin, putrescin, ethylidenediamine, isoamyl amine

3 *From the sulphur containing radicals* —Hydrogen sulphide, methyl mercaptan, ethyl mercaptan, ethyl sulphide

Of these, many are difficult to obtain, and others are unsatisfactory because they are too diffusible For example, in a stoppered bottle fitted with a manometer the powerful adsorbent action of activated charcoal for H_2S can be readily demonstrated When H_2S is aspirated through a charcoal screen, however, adsorption is greatly reduced and a good deal of the gas escapes This can be confirmed by putting on a civilian respirator and entering an atmosphere containing sulphuretted hydrogen, the smell of the gas is easily appreciated even in low concentration Methyl mercaptan is more satisfactory for experimental work it occurs naturally in the offensive gases of body discharges, it has a disgusting smell in low concentration, it is not excessively diffusible (BP 7 6° C), and there is a simple chemical method for detecting the gas and measuring its concentration

The apparatus devised for testing the efficiency of the blanket (fig 2) consists essentially of two bell jars, the mouths of which can be clamped tightly together A piece of blanket lying inside a rubber air ring (the inner edge having been cut open) is placed between the bell jars which are then clamped firmly against the rubber so as to make an airtight compartment The methyl mercaptan is produced by the interaction

---

[1] Alvarez, W C *Physiol Rev* 1924 4 352

TABLE II—CALCIUM METABOLISM

—	No of cases	B M R	Periods of three days						
			Intake	Output	Balance	Output		Balance	
						Mean	Range	Mean	Range
			(g)			(mg per kg body weight)			
Normals[1]	9	– 8	0 34	0 75	– 0 41	13 3	9 1–19 3	– 7 58	– 3 9 to – 11 7
Untreated thyrotoxicosis[1]	30	+ 29	0 28	1 34	– 1 06	26 41	11 9–46 2	– 20 88	– 7 5 to – 40 5
Thyrotoxicosis on iodine[2]	27	+ 2	0 28	1 12	– 0 84	21 2	8 2–37 9	– 15 26	– 1 to – 33 1
Thyrotoxicosis after operation[2]	30	– 10	0 28	0 71	– 0 43	13 3	5 3–23 6	– 8 44	+ 1 to – 20 4
Untreated myxœdema[3]	3	– 41	0 28	0 65	– 0 37	8 62	7 9– 9 7	– 4 78	– 3 5 to – 6 2
Treated myxœdema[3]	3	+ 5	0 25	0 92	– 0 67	13 51	9 9–19 4	– 9 79	– 7 6 to – 13 8
Parathyroid tetany[4]	7	– 11	0 25	0 48	– 0 23	8 7	6 8–11 5	– 4 12	– 2 to – 6 5
Hyperparathyroidism[1,4] *	8		0 33	1 4	– 1 07	24 64*	18 3–28 7	– 17 62*	– 10 4 to – 22 7

* The mean of five of the eight cases where weights were recorded

RESULTS OF SUBTOTAL THYROIDECTOMY

Serum calcium and inorganic phosphorus after subtotal thyroidectomy are given in table II, the same patients having been studied in the untreated stage of the thyrotoxicosis The mean serum calcium was 10 52 mg and mean inorganic phosphorus 3 74 mg per 100 c cm, compared with the normal of 10 39 mg and 3 83 mg and with the corresponding values in thyrotoxicosis of 9 71 mg and 3 17 mg These results have been studied statistically by Robertson[2] when it was found that a significant rise in both the calcium and inorganic phosphorus occurred in thyrotoxicosis after subtotal thyroidectomy The postoperative serum findings agreed well with those for the normal controls

Calcium output—Table II shows the mean negative balance to be 8 44 mg per kg of body-weight, demonstrating that the increased output of calcium in untreated thyrotoxicosis had returned to normal There was also an appreciable fall in the calcium output after operation compared with the output after the maximum effect of iodine It has already been pointed out that iodine caused a significant fall in the calcium output from a negative balance of 20 88 mg to 15 26 mg per kg Subtotal thyroidectomy brought about a further fall from 15 26 mg to 8 44 mg The difference between these last two mean values is also highly significant ($t = 4\ 11$, $P = 0\ 001$)

After subtotal thyroidectomy the ratio of the fæcal to the total output of calcium approached normal, thus reversing the abnormal fæcal to urinary ratio of untreated thyrotoxicosis (table V) From the results of Aub and his colleagues[11] a slight increase in the urinary excretion of calcium appears to persist after subtotal thyroidectomy Examination of their protocols however showed the presence of high basal metabolisms in some of their cases after operation This suggests that there was a persistence of the thyrotoxicosis despite subtotal thyroidectomy and would explain a urinary excretion of calcium above normal

Phosphorus output—The total output of phosphorus is shown in table III In view of the variable phosphorus intakes the phosphorus balance is probably a more accurate index for study It will be seen that the mean phosphorus balance after iodine was minus 10 76 mg per kg and that this fell to minus 2 41 mg after subtotal thyroidectomy There is a highly significant difference between these mean values for $t = 3\ 57$ and $P = 0\ 001$ The phosphorus balance of normals in table III is minus 10 54 mg per kg There is a highly significant difference between this value and the minus 2 41 mg for cured thyrotoxicosis There is thus a diminished phosphorus output in thyrotoxicosis after subtotal thyroidectomy

If an average of the six cases of Aub and others[11] is taken it is found that the partition of phosphorus in the urine and fæces after thyroidectomy is almost equal (table V) In normal subjects 68% of phosphorus is passed in the urine This table shows that the fæcal phosphorus falls to normal after operation but that the urinary output of phosphorus has fallen below normal

CALCIUM AND PHOSPHORUS METABOLISM IN MYXŒDEMA

It is a natural corollary to the increased calcium output in thyrotoxicosis to find a reduced output of calcium in myxœdema, and since subtotal thyroidectomy reduces the increased calcium output of thyrotoxicosis to normal one would expect adequate thyroid medication to raise the reduced calcium output in myxœdema to normal There is little or no evidence from radiographic studies that in myxœdema the bones are denser than normal Golden and Abbott,[26] in a study of 51 cases of hypothyroidism, could find no evidence of excessive calcification of bone

Serum calcium, inorganic phosphorus and phosphatase—In a previous paper[3] the serum calcium and inorganic

TABLE III—PHOSPHORUS METABOLISM

—	No of cases	B M R	Periods of three days						
			Intake	Output	Balance	Output		Balance	
						Mean*	Range	Mean*	Range
			(g)			(mg per kg body weight)			
Normals[1]	9	– 8	1 12	1 71	– 0 59	31 3	23 4–41 5	– 10 54	– 0 4 to – 19 5
Untreated thyrotoxicosis[2]	30	+ 29	1 59	2 3	– 0 71	44 8	28 4–70 7	– 14 68	+ 7 4 to – 34 8
Thyrotoxicosis after iodine[2]	27	+ 2	1 54	2 12	– 0 58	40 6	24 –54 9	– 10 76	+ 5 9 to – 24
Thyrotoxicosis after operation[2]	30	– 10	1 55	1 7	– 0 15	31 4	13 –41 8	– 2 41	+ 14 9 to – 16 6
Untreated myxœdema[3]	3	– 41	1 62	1 31	+ 0 31	18 2	10 –28 7	+ 4 21	+ 9 3 to 0
Treated myxœdema[3]	3	+ 5	1 54	2 24	– 0 7	32 8	22 1–43 4	– 9 88	– 7 6 to – 11 8
Parathyroid tetany[4]	7	– 10	1 4	1 46	– 0 06	27 2	22 8–36 8	– 1 02	+ 2 9 to – 7 1

* In view of the variations in the phosphorus intakes by as much as 0 5 g the phosphorus balance is a more reliable index for comparing various diseases than the phosphorus output

CALCIUM AND PHOSPHORUS EXCRETION IN THYROTOXICOSIS AND MYXŒDEMA

J DOUGLAS ROBERTSON, M D , D SC ST AND , D P H
CLINICAL CHEMICAL PATHOLOGIST TO THE MIDDLESEX HOSPITAL

(*Courtauld Institute of Biochemistry, Middlesex Hospital*)

IN this paper an attempt is made to determine the mechanism of the increased calcium excretion in thyrotoxicosis Several theories have been put forward, but none appears to explain satisfactorily the various disturbances in calcium and phosphorus metabolism As a result of observations published by Beaumont, Dodds and Robertson [9] and by Robertson [1 2 3 4 15 16] on thyrotoxicosis before and after operation, myxœdema before and after treatment and parathyroid tetany a theory is put forward which explains many of the disturbances of calcium metabolism met with in dysfunctions of the thyroid gland Kummer [17] was among the first observers to draw attention to an altered density of the bones in thyrotoxicosis and this has since been confirmed by Plummer and Dunlap [18] and Aub and others [11] That decalcification in thyrotoxicosis may even lead to osteomalacia has been described by von Recklinghausen [19]

UNTREATED THYROTOXICOSIS

Serum calcium and inorganic phosphorus —There is no unanimity about the level of the serum calcium in thyrotoxicosis , Aub and his colleagues [11] stated that it was normal though later [20] they said it was slightly raised McCullagh [21] agreed with the earlier view of Aub and his colleagues, while Wade [22] found the serum calcium low This problem has recently been investigated by Robertson [2] and the results are given in table I The mean serum calcium is 9 71 mg and mean inorganic phosphorus 3 17 mg per 100 c cm , compared with the normal values of 10 39 and 3 83 mg per 100 c cm The difference in the serum analyses between thyrotoxics and normals is highly significant (for calcium t = 7 25 , P < 0 001 and for inorganic phosphorus t = 5 4 , P < 0 001) There seems to be no doubt therefore that in untreated thyrotoxicosis the serum calcium and inorganic phosphorus are low

Calcium output —On a low calcium intake of 0 1 g daily, normal subjects excrete chiefly in the fæces but also in the urine about 0 26 g per day, resulting in a net loss to the body of 0 16 g calcium daily [9 10] In thyrotoxicosis on a similar intake of calcium there is a much greater negative balance Towels [23] was one of the first observers to note this great disparity in a study of 3 cases of thyrotoxicosis Aub and his co-workers,[11] Hansman and Wilson [12] Puppel, Klassen and Curtis,[24] and Beaumont, Dodds and Robertson [9] have extended these observations In table II are given the findings of the last group of investigators There was a well-marked increase in the calcium output in thyrotoxicosis compared with that in normal controls On a low calcium intake the net loss to the body rose from the mean normal of 7 58 mg per kg of body-weight to 20 88 mg

Most investigators agree that on a low calcium intake normal subjects have a urinary output of calcium which is less than the intake and averages a quarter of the total output Thus Aub and others [11] found per three-day period that on an intake of 0 33 g their normal subjects excreted 0 19 g in the urine and 0 6 g in the fæces In thyrotoxicosis they [11] stated that there was a proportional increase in the calcium excretion in both the urine and fæces whereas in hyperparathyroidism Aub [29] and Thomson and Collip [25] said that the urinary output alone rose These statements have been quoted until it has become accepted that one of the pathognomonic features of thyrotoxicosis is an augmented fæcal excretion of calcium In table IV analyses of the differential calcium output in normal subjects, hyperparathyroidism and thyrotoxicosis are given The findings have been taken from papers by Bauer, Albright, and Aub,[6 11] Hunter and Turnbull [5] Bassett [7] and Garlock [8] As the calcium intakes are approximately the same the respective outputs are comparable

In both hyperparathyroidism and thyrotoxicosis there was a greatly increased urinary output of calcium, averaging six times the normal There was one case of thyrotoxicosis where the fæcal output rose to three times the normal mean, but this was accompanied by a urina output fifteen times the normal mean All the oth cases of thyrotoxicosis had a fæcal output of calciu within the average normal limits The two mean valu of 0 6 g for normals and 0 77 g for thyrotoxicosis (tal IV) have no significant difference (t = 1 27 , P > 0 If a similar calculation is made for the fæcal output calcium in hyperparathyroidism the mean values 0 6 g for normals and 0 36 g for hyperparathyroidis have a highly significant difference (t = 3 2 , P < 0 0 With regard to the differential output of calcium it seem in conflict with current opinion, that in thyrotoxico the fæcal output of calcium is normal and in hype parathyroidism it is diminished, whereas in both diseas there is an equivalent increase in the urinary output calcium

Phosphorus output —In table III the phosphorus outp in thyrotoxicosis is given with corresponding valu for the normal controls The negative phosphor balance is 14 68 mg per kg of body-weight which increased above the normal of 10 54 mg This loss mu partly be due to the phosphorus liberated in prote katabolism By assuming that in thyrotoxicosis thyrox mobilises tertiary calcium phosphate from the bone Aub and his colleagues [11 20] believe that the residu phosphorus is the amount combined with calciur Sherman and his colleagues [13 14] found that in norm people 32% of the excreted phosphorus appeared in th fæces (table V) On a three-day intake of 1 93 g pho phorus the fæcal excretion was 0 67 g and the urinar output 1 46 g On a similar intake, Aub and his co leagues [11] found in six cases of thyrotoxicosis an averag urinary excretion of 2 3 g and a fæcal output of 1 03 This shows a proportional and significant increase in bot the fæcal and urinary output of phosphorus

TABLE I—BLOOD SERUM STUDIES IN THYROPARATHYRO DISEASES

—	No of cases	Serum calcium		Serum inorganic phosphorus		Calciu × pho phoru produ
		Mean	Range	Mean	Range	
		(mg per 100 c cm)				
Normal controls [1]	60	10 39	9 9–11 1	3 83	3 1–4 8	39 8
Untreated thyrotoxicosis [2]	14	9 71	9 1–10 8	3 17	2–3 5	30 8
Thyrotoxicosis after subtotal thyroidectomy	14	10 52	9 8–11 2	3 74	3 2–4 7	39 3
Untreated myxœdema [3]	9	10 51	9 8–11 2	3 93	3 5–4 5	41 3
Treated myxœdema [3]	9	9 85	9–10 6	4 22	3 8–4 7	41 6
Parathyroid tetany [4]	10	6 83	3 4–8 7	5 64	4 1–8 4	38 5
Hyperparathyroidism [5 6 7 8]	8	14 35	13 3–16 7	1 87	1–2 6	26 8

EFFECT OF IODINE

Tables II and III show the alterations in the calciu and phosphorus outputs consequent on iodine medicatio It is well known that iodine brings about a symptomat improvement in thyrotoxicosis with a fall in pulse-rat and basal metabolism The maximum benefit is reache in about ten days and this artificial remission is in th majority of cases maintained for several weeks Th was the sequence in the cases reported in tables II and II During the remission and at a time when the bas metabolism was constant, the calcium and phosphoru outputs were estimated *It will be seen that the mea* calcium and phosphorus output fell as the heat outpu diminished In a previous publication by Beaumont Dodds and Robertson [9] it was pointed out that althoug the mean mineral output fell, in several cases no diminu tion in the calcium and phosphorus output occurred Despite this a statistical analysis shows *that the fal* in the calcium and phosphorus output after iodine i significant (for calcium t = 3 38, P = 0 001 , for phos phorus t = 4 2 , P = 0 001)

TABLE V—DIFFERENTIAL CALCIUM AND PHOSPHORUS OUTPUTS IN NORMALS AND IN DISEASES OF THE THYROPARATHYROID GLANDS (3-DAY PERIODS)

Diagnosis	Calcium metabolism							Phosphorus metabolism						
	Intake	Output						Intake	Output					
		Urine			Fæces				Urine			Fæces		
	(g)	Total (g)	Mg / kg	% Output	Total (g)	Mg / kg	% Output	(g)	Total (g)	Mg / kg	% Output	Total (g)	Mg / kg	% Output
Untreated thyrotoxicosis[11, 1]	0 28	1 27	24 6	60	0 8	15 2	40	2 07	2 3	45 1	73	1 03	19 6	27
Thyrotoxicosis after subtotal thyroidectomy[11]	0 28	0 41*	8 9	39	0 65	13	61	1 96	0 82	16 6	55	0 66	13 2	45
Untreated myxœdema[11, 4]	0 21	0 11	1 8	19	0 46	7 2	82	1 72	0 86	13 6	55	0 71	11 2	45
Treated myxœdema[4, 11]	0 26	0 29	5 4	40	0 43	7 4	60	1 53	1 41	25 4	75	0 48	5	25
Parathyroid tetany[3]	0 26	0 13	2 1	23	0 43	7 1	77	1 7	0 76	12 5	44	0 96	15 8	56
Hyperparathyroidism[5, 6, 7, 8]	0 33	1 04	20 7	74	0 36	7 2	26							
Normals[11, 13]	0 33	0 19	3 2	24	0 6	8 9	76	1 93	1 46	26 6	68	0 67	12 2	32

* The protocols of Aub et al [11] give a mean total calcium output of 21 9 mg /kg as compared with 13 3 mg for a like series reported obertson.[3] Bauer et al [13] found the normal calcium output 12 1 mg /kg and Robertson in his series [3] 13 3 mg /kg The higher output zed by Aub et al postoperatively may be due to a persistence of the thyrotoxicosis in some of their cases, for the BMRs after operation + 18, + 1, + 7, + 27, + 12, and − 6 † Calcium ‡ Phosphorus

sphorus and a low serum inorganic phosphorus, and relief of thyrotoxicosis by subtotal thyroidectomy ccompanied by a rise to normal in serum inorganic sphorus In myxœdema there is a diminished renal retion of phosphorus which is increased by adequate roid feeding On the other hand, there are several ections to the view that thyroxine has a specific action controlling the loss of phosphorus by the kidneys er successful thyroidectomy (when presumably the roxine secretion is normal) the urinary phosphorus s well below normal In thyrotoxicosis the urinary l fæcal phosphorus are both increased Although roid feeding causes an increased output of urinary osphorus in myxœdema, it is accompanied by a nificant rise in the serum inorganic phosphorus

There is also evidence to support the view that there is definite relationship between thyroxine secretion and renal excretion of calcium In thyrotoxicosis there an increased renal excretion of calcium, the fæcal tput being normal, and a low serum calcium, the ief of thyrotoxicosis by subtotal thyroidectomy brings out a return of the calcium excretion and serum lcium to normal In myxœdema there is a diminished al excretion of calcium (the fæcal output is normal), spite a serum calcium slightly above normal; adeate thyroid feeding raises the renal excretion of calcium e fæcal output is unchanged) and causes the serum lcium to fall

All these factors can be explained by postulating that thyrotoxicosis an excessive secretion of thyroxine acts rectly on the kidneys and stimulates them to increase eir output of calcium. This may be achieved by wering the renal threshold for calcium or by a simple crease in renal metabolism The first appears to be e more likely,[15] since Aub and others [11] have shown at an increased metabolism per se does not increase the lcium output The diminished secretion of thyroxine myxœdema produces the converse picture It follows erefore that the renal excretion of phosphorus, except here it is related to protein katabolism and anabolism, secondary to the calcium output in the urine

A theory has been put forward to explain the decalcication in thyrotoxicosis[15] It is suggested that in yrotoxicosis an excessive secretion of thyroxine acts rectly on the kidney and lowers its threshold for calum. This causes a fall in the serum calcium and as a sult there is an increased mobilisation of calcium from e bones in an attempt to raise the diminished serum lcium. Conversely in myxœdema a diminished cretion of thyroxine raises the renal threshold for lcium and the calcium output in the urine falls below ormal In other words the mechanism responsible for e increased urinary excretion of calcium in thyrooxicosis is not one of vis a tergo akin to that of the arathyroid hormone The mechanism is a vis a fronte hereby the normal excretion of calcium in the urine is ccelerated or depressed according to whether a greater r lesser secretion of thyroxine than normal prevails

The urinary excretion of phosphorus is believed to be secondary to the urinary excretion of calcium except when it is related to protein metabolism

SUMMARY

In untreated thyrotoxicosis the serum calcium and inorganic phosphorus are diminished, subtotal thyroidectomy, in the absence of any impairment of the parathyroids, results in a return of the serum calcium and inorganic phosphorus to normal

In untreated thyrotoxicosis the calcium output is above normal The increased loss of calcium is in the urinary output only, the fæcal loss being essentially normal Iodine causes a significant diminution in the mean calcium output, but the output still remains above normal Subtotal thyroidectomy results in a return of the mean calcium output to normal

In untreated thyrotoxicosis the phosphorus balance is more negative than normal and the loss is predominantly in the urine Iodine therapy results in a return of the mean phosphorus balance to normal Subtotal thyroidectomy lowers the phosphorus balance to below normal There is a highly significant difference between the phosphorus balance of normal subjects and of thyrotoxic cases after a successful subtotal thyroidectomy.

In untreated myxœdema the serum calcium and inorganic phosphorus are normal while the serum phosphatase is diminished With thyroid feeding the serum calcium falls and the inorganic phosphorus rises to a level which makes the calcium and phosphorus product the same after as before thyroid feeding The serum phosphatase rises to normal

In untreated myxœdema the calcium output is diminished. Adequate thyroid feeding increases the calcium output to normal, and the younger the subject the greater is the increase in the calcium excretion The fall in the calcium output only affects the urine, and it is in the urine that the increased calcium output occurs after thyroid feeding The fæcal output of calcium is normal in myxœdema and is not affected by thyroid feeding

In untreated myxœdema the phosphorus balance is positive, compared with a negative balance in normal people Thyroid feeding converts the positive balance into a negative balance in the region of normal The diminution in phosphorus output is in the urine There is a normal fæcal output of phosphorus The diminished phosphaturia is both total and relative Thyroid feeding produces a great increase in the phosphaturia and at the same time a significant fall in the output of phosphorus in the fæces to below normal

It is suggested that thyroxine directly affects the renal threshold for calcium Excessive secretion of thyroxine in thyrotoxicosis lowers the threshhold whereas deficient secretion in myxœdema raises it

The raised excretion of phosphorus in thyrotoxicosis and the lowered excretion in myxœdema are probably secondary to the changes in calcium excretion.

References at foot of next page

phosphorus were stated to be normal in a series of nine cases The mean and range of these cases are given in table I The phosphatase was found to be diminished

Calcium output in myxœdema before and after treatment has been studied in five cases by Aub and his colleagues[11] and in three cases by Robertson[3] Both found a diminished calcium output in untreated myxœdema Robertson found the calcium output in his three cases to be 7 85, 9·69 and 8 62 mg per kg, with a mean value of 8 62 mg, compared with the mean normal output[1] of 13 3 mg per kg with a range of 9 1–19 3 mg These figures are all for periods of three days The calcium balance, probably a more accurate index for comparison, showed a mean negative balance of 4 78 mg per kg of body-weight, compared with the normal of 7 58 mg (table V)

In table V are given the findings in six cases of myxœdema—five investigated by Aub and others[11] and one by Robertson[3] A statistical study of the results show that it is in the urine only that there is a significant reduction in the calcium output, the fæcal calcium output is normal

Phosphorus output is diminished Normally there is a negative phosphorus balance (table III) amounting to 10 54 mg per kg body-weight, while in his three cases of untreated myxœdema Robertson[3] found a mean positive balance of 4 21 mg per kg and Aub and others,[11] in their five cases, found a mean positive balance of 3 94 mg per kg

There is a well-marked fall in the urinary output of phosphorus in myxœdema—13 6 mg per kg compared with the normal of 26 6 mg (table V) This difference is highly significant ($t = 3\ 75$, $P < 0\ 01$) The fæcal output of phosphorus is normal ($t = 0\ 365$, $P > 0\ 7$)

RESULTS OF THYROID MEDICATION IN MYXŒDEMA

Serum calcium and inorganic phosphorus —Adequate thyroid therapy produced significant changes in the blood-serum There was a fall in the serum calcium from a mean of 10 51 mg to 9 85 mg per 100 c cm, a rise in the inorganic phosphorus from a mean of 3 93 mg to 4 22 mg per 100 c cm, and the phosphatase, which was diminished to a mean of 5 41 units, rose to a normal mean of 7 37 units The rise in the inorganic phosphorus might be explained as an attempt of the body to maintain a constant calcium × phosphorus product If this is so these findings were in contrast to those found in thyrotoxicosis where the serum calcium and inorganic phosphorus were both diminished

Calcium output —The diminished negative balance of 4 78 mg per kg per three days increased to 9 79 mg after thyroid feeding which was in excess of the normal mean of 7 58 mg In the three cases investigated the greatest increase in calcium output took place in the youngest subjects in whom the negative balance rose from 3 51 to 13 8 mg In the five cases of myxœdema reported by Aub and others[11] thyroid feeding produced an increased calcium loss in two cases, while three cases excreted less calcium after thyroid than before

Thyroid produced a well-marked rise in the urinary output of calcium The mean values of 1 8 mg per kg and 5 4 mg for urinary calcium (table V) before and after thyroid feeding have a highly significant difference ($t = 2\ 26$, $P = 0\ 05$) The fæcal output of calcium remained unchanged and within normal limits ($t = 0\ 46$, $P > 0\ 6$)

Phosphorus output —Thyroid feeding caused definite changes in the phosphorus metabolism In untreated myxœdema the body stored phosphorus at the rate of 1 4 mg per kg of body-weight daily After thyroid the positive balance changed into a negative balance of 3 3 mg daily, compared with the normal negative balance of 3 5 mg The phosphaturia of untreated myxœdema was much diminished both totally and relatively (table V) After thyroid feeding there was a highly significant rise in the urinary output of phosphorus to normal The normal fæcal output of phosphorus in myxœdema of 11 2 mg per kg fell to 5 mg These differences are significant for $t = 3\ 06$ and $P < 0\ 01$

MECHANISM OF CALCIUM AND PHOSPHORUS LOSS IN THYROTOXICOSIS

The various theories put forward to explain the calcium loss in thyrotoxicosis have already been discussed[1] They include an increased basal metabolism per se, an increased phosphorus excretion, vitamin-D deficiency, the direct stimulating katabolic effect of thyroxine on bone, and a coexisting hyperparathyroidism In has centred around the two last

Direct action of thyroxine on bone —This theory was p forward by Aub and his colleagues[11] and has received support from Hunter,[27] Thomson and Collip,[25] Cope and Donaldson[28] and others They have argued that thyroxine has a direct katabolic effect on bone, causing a flow of the products of demineralisation into the blood stream then to be excreted to a large extent by the kidneys but also to an appreciable extent in the fæces In other words, the excessive calcium loss is the result of a vis a tergo For this theory to be acceptable the serum calcium in thyrotoxicosis should be raised or at least normal, depending on whether the excretion of calcium cannot or can keep pace with calcium mobilisation In fact, the serum calcium in thyrotoxicosis is diminished Further evidence that thyroxine does reduce the serum calcium is its similar action in myxœdema and parathyroid tetany

Coexisting hyperparathyroidism —The presence of a coexisting hyperparathyroidism as the cause of the increased calcium loss in thyrotoxicosis has been put forward by Hansman and Wilson[12] Like the previous theory such a conception would demand a raised or normal serum calcium, and not a diminished one as is present in thyrotoxicosis Further the calcium output findings in hyperparathyroidism and thyrotoxicosis are not similar In hyperparathyroidism the fæcal output of calcium is below normal, whereas it is normal in thyrotoxicosis Again such a conception does not explain why in thyrotoxicosis iodine causes a significant fall in the calcium output, and subtotal thyroidectomy causes a return of the calcium output to normal The presence of an established hyperparathyroidism should not be influenced by either of these clinical conditions It is true that in the published figures little correlation appears to exist between the severity of the thyrotoxicosis and the calcium loss, but there is probably a danger of laying too much stress on the accuracy of the urinary and fæcal samples for calcium estimation The collection of specimens is a crude method and three days seems to be too short an observational period to compare in accuracy with an estimation of basal metabolism

TABLE IV—COMPARISON OF DIFFERENTIAL CALCIUM EXCRETION IN NORMALS, HYPERPARATHYROIDISM AND THYROTOXICOSIS

(Results expressed in grammes per three days)

Calcium intake			Urinary output calcium			Fæcal output calcium		
Normals[10]	Hyperparathyroidism[5,6,7,8]	Thyrotoxicosis[11]	Normals[10]	Hyperparathyroidism[5,6,7,8]	Thyrotoxicosis[11]	Normals[10]	Hyperparathyroidism[5,6,7,8]	Thyrotoxicosis[11]
0 31	0 3	0 32	0 20	1 5	0 68	0 44	0 52	0 85
0 21	0 45	0 21	0 11	1 42	2 92	0 38	0 59	1 82
0 31	0 3	0 31	0 30	0 68	1 39	0 41	0 24	0 71
0 29	0 3	0 29	0 05	1 36	1 08	0 49	0 24	0 69
0 34	0 3	0 28	0 06	0 5	1 04	0 39	0 38	0 56
0 28	0 31	0 32	0 2	1 31	0 65	0 55	0 19	0 5
0 38	0 38	0 34	0 23	0 81	0 38	0 65	0 43	0 58
0 33	0 3	0 24	0 04	0 77	0 81	0 86	0 3	0 45
0 38			0 09			0 71		
0 39			0 24			0 96		
0 34			0 27			0 31		
0 35			0 16			0 44		
0 26			0 38			0 33		
Mean 0 33	0 33	0 29	0 19	1 04	1 12	0 6	0 36	0 77

Renal excretion of calcium and phosphorus —There are significant alterations in the renal excretion of phosphorus and calcium in thyrotoxicosis and myxœdema This suggests a direct action of thyroxine on the kidneys It would follow that there is a direct relationship between the secretion of thyroxine and the renal output primarily of phosphorus or calcium or both

Several findings favour a direct relationship between thyroxine secretion and the renal output of phosphorus In thyrotoxicosis (when presumably thyroxine secretion is increased) there is an increased renal excretion of

86 Calculated from these figures, the standard error of the differential drop due to amytal is 1 064, the observed drop is 3 16 times greater and is therefore significant

While on the average the drop in IQ attributable to the dose of amytal is only 3–4 points, in individual cases large rises and falls are observed But similar large individual rises and falls are found in the experiments with two inert capsules The standard deviation of individual variations in IQ between the two versions is not much greater under amytal (10 92) than without (9 86) It is a function of the correlation between the two versions of the test, since it is the deviation of scores on the B version for any given score on A, and its square = $(1 - r^2) \sigma^2$, where r is the correlation between the two versions and σ is the standard deviation of scores on the B version If amytal has an exceptional effect on any appreciable proportion of the cases, the correlation between scores on the two versions will be lower when amytal is given with one of them From the equation the correlation when no amytal was given can be inferred as 0 84, and when it was given, 0 81 The difference is only 0 91 of its standard error (using Fisher's[2] procedure) and is therefore of an order which could be expected by chance 3 or 4 times in 10

A drop of 3–4 points in an individual's IQ does not represent an appreciable decline in his mental efficiency, nearly 400 cases were needed to find whether the differential drop of this amount was large enough to be significant IQs vary much more widely among people in a single occupation, even when highly specialised For instance, a diagram on p 27 of the handbook for the Cattell tests shows that the middle 50% in the range of normal IQs of persons in each of 25 different professions or trades varies by as much as 20–30 points A variation of 3 or 4 points is not likely to affect an individual's working efficiency seriously, when the ability of his compeers varies between so much wider limits

Intelligence, it is true, is not the only psychological factor on which occupational success depends Salesmen need to be fluent, architects need to judge shapes well, policemen need stable temperaments, and so on, but all need an appropriate modicum of intelligence—it is the factor which most generally determines success It is also the one which can be measured most adequately Tests which purport to measure other functions are usually found to measure them only to a secondary extent, success in doing them, as in occupations, depends mainly on intelligence This does not take into account the special conditions which arise when emotional equilibrium is disturbed

It may therefore be concluded that, in doses of gr 3 or less, there is no evidence that sodium amytal impairs intellectual efficiency to any important extent The actual dose employed in clinical practice will have to be chosen with individual susceptibilities and requirements in mind For those engaged on highly specialised work, its effect on the special aptitudes involved should be separately tested

SUMMARY

In an experiment on 390 men it was found that a dose of gr 3 of amytal lowered IQs by 3 36 points on an average This result is statistically significant, taking the numbers into consideration, but is not important for the individual Thus where amytal is indicated as suitable clinically, no fear need be felt, in prescribing doses up to gr 3, that it may interfere with the functioning of the patient's intelligence It must however be prescribed with individual susceptibilities and requirements in mind

---

[2] Fisher R A Statistical Methods for Research Workers, Edinburgh 1938 Section 35

DIFCO SS AGAR
THE DIAGNOSIS OF BACILLARY DYSENTERY

A W Pot, M D UTRECHT
ACTERIOLOGIST IN THE PUBLIC HEALTH SERVICE OF CURACAO, NETHERLANDS WEST INDIES

EVERY bacteriologist who has to examine dysenteric ools realises that his positive results do not represent ore than a part of the actual number positive Notithstanding the rôle bacteriophage is said to play in apidly lysing dysentery bacilli in the samples, one cannot scape the impression that our usual culture media are ot the most suitable for these fastidious organisms he bacteriological diagnosis of typhoid and paraphoid fevers has been greatly improved in the last ecades by such concentrating and selective media as he tetrathionate broth of Muller and the very useful ismuth-sulphite agar of Wilson and Blair, but for ysentery no other media have been available than gars containing lactose and a suitable indicator, which hile allowing an easy differentiation between fermenters and non-fermenters of milk sugar at the same ime favour a luxurious growth of *Bacterium coli* There ore the detection of the relatively few dysentery bacilli hat are found in the later days of the disease or in he stools of carriers is very uncertain Moreover in a aboratory working apart from the hospital it is rarely ossible to examine freshly passed stools, in most samples other organisms have had ample time to proliferate in spite of the addition of glycerol

Recently the Difco Laboratories of Detroit, U S A, have prepared a dehydrated medium, S(almonella)-S(higella)-agar, which, according to its manufacturers, should be selective for both the salmonella group, *Bact typhosum* included, and the dysentery bacteria The dry powder contains

Bacto beef extract	5 g	Sodium thiosulphate	8 5 g
Difco proteose peptone	5 g	Ferric citrate	1 g
Bacto lactose	10 g	Bacto agar	17 g
Bacto bile salts no 3	8 5 g	Bacto neutral red	0 025 g
Sodium citrate	8 5 g	Bacto brilliant green	0 33 mg

Of this powder, 63 5 g must be suspended in one litre of distilled water, boiled for a minute or two and without any further sterilisation poured into sterile petri dishes The surface of the plates must be quite dry when inoculated

The medium is being used in several public-health laboratories in the United States, and the good results reported by Mayfield and Gober,[1] have induced me to compare SS agar with Endo's, which I have used for this purpose for more than ten years, first in Holland (National Institute for Public Health, Utrecht) and later in Curacao Each of a series of 200 fæcal specimens sent to this laboratory for bacteriological examination for dysentery bacilli between Oct 23 and Dec 15, 1941, has been inoculated in the usual way on two large dishes (diameter ca 6 in) with Endo agar and on one normal petri dish with SS agar The results are given in the table

Species of dysentery bacilli	Isolated from—		
	both Endo's and SS agar	Endo's agar only	SS agar only
Flexner group	16	1	13
Sonne	2		2
Schmitz			1

All Flexner strains recorded agglutinated in one or more of the Flexner V to Z sera from the Standards Laboratory, Oxford, so-called inagglutinable strains have been disregarded In 7 instances the growth of *Bact coli* had been so far suppressed on SS agar that it was possible to inoculate the peptone water tube and the sugar tubes for further differentiation directly from this plate, Endo's agar has only once given a nearly pure culture of dysentery bacilli *Proteus vulgaris* does not spread on the SS plate The difference between the two media seemed to me great enough to justify further use of SS agar

In the examination of stools and urines for *Bact typhosum*, a comparison of Endo's, SS agar and Wilson and Blair's old standard media, performed on a small series of samples, proved that Wilson and Blair's medium is certainly superior to both the others

I wish to express my thanks for the help given me by Prof A D Gardner of Oxford

---

[1] Mayfield C R and Gober, M *Amer J publ Hlth*, 1941, 31, 363

Dr R L SMITH, medical officer for Rugby School, has been appointed health adviser to the National Association of Boys' Clubs

INFLUENCE OF SODIUM AMYTAL ON INTELLIGENCE-TEST SCORES

PATRICK SLATER
M A OXFD, D PSYCH
STATISTICAL PSYCHOLOGIST TO THE WAR OFFICE, PSYCHOMETRIC PSYCHOLOGIST TO ST THOMAS'S HOSPITAL

WILLIAM SARGANT
M B CAMB, M R C P, D P M
PSYCHIATRIC SPECIALIST TO THE EMS, ASSISTANT TO THE DEPARTMENT OF PSYCHIATRY, ST GEORGE'S HOSPITAL

MARGARET GLEN
TECHNICAL ASSISTANT

(From an EMS Neurological Unit)

IN times of temporary stress, a drug which reduces apprehension without greatly lowering intellectual efficiency has many obvious uses It may be used, for instance, not only therapeutically but also prophylactically, the man who fears he may have a sudden attack of panic if a particular situation arises is fortified in advance if he knows that he carries in his pocket an efficient antidote During air-raids on London various sedatives were tried on anxious patients, among others, sodium amytal was found to reduce apprehension and induce a state of relative mental calm Its effect lasts about 4 hours; it is completely metabolised by the body and has no cumulative or undesirable after-effects It has been used in clinical practice for many years The most useful dosage is, for different subjects, gr 1–3 by mouth Too large a dose can produce an increasing degree of euphoria and absence of restraint and self-control, or an imperative desire to sleep To determine its practical usefulness it is essential to have some notion of the degree to which it may impair the normal processes of thinking, and the capacity to react reasonably as well as calmly to an emergency The following experiments were designed to investigate this problem, by measuring the effect of the drug on intelligent thought processes as exemplified by a standard intelligence test

First experiment —Men who come into hospital in one week are given a routine intelligence test in the next week The investigation was incorporated in this routine The men were tested one day, usually on the Monday, and re-tested next day, in groups of 12 or less at a time An hour before each test they had a capsule, one time it contained 3 gr of sodium amytal, the other time a small amount of glucose The routine was the same, the capsules appeared identical The tests used were Cattell IIA and IIB [1] They are exactly parallel tests, suitable to the men's general level of ability Each has 6 sections (synonyms, classification, opposites, analogies, completion, and miscellaneous problems) and makes an intelligence test of standard type with m verbal but some non-verbal items, taking 66 min to A short practice test used on the first occasion expl the types of question Scores on each test can converted into intelligence quotients, which should strictly comparable Scores may improve slightly on the second occasion through practice So amytal was give sometimes on the first day and sometimes on the secon always with the B version The table gives the essenti data obtained each time the experiment was made

RESULTS IN TWO EXPERIMENTS

In the first experiment amytal was given to those doing the B form and inert capsules to those doing the A form In the second experiment inert capsules were given to all subjects

Date	Cases	Average IQ		Difference	Standard deviations	
		(a) A form	(b) B form		(a)	(b)
FIRST EXPERIMENT						
May 26–27, 1941	29	89 59*	87 52	− 2 07	16 32	17 96
June 1–2 ,,	11	91 55	77 45*	−14 1	16 37	18 59
,, 9–10 ,,	30	96 0	87 83*	− 8 17	17 13	19 66
,, 16–17 ,,	8	87 0*	76 38	−10 62	17 06	16 03
July 7–8 ,,	20	87 25*	79 25	− 8 0	20 35	18 28
,, 21–22 ,,	17	93 47	82 59*	−10 88	14 35	16 91
,, 28–29 ,,	30	91 5	76 83*	−14 67	18 42	16 84
Aug 18–19 ,,	11	98 36*	93 36	− 5 0	18 04	15 69
Feb 9–10, 1942	14	87 71*	82 71	− 5 0	15 84	18 54
,, 16–17 ,,	16	91 38*	85 12	− 6 26	16 98	22 61
SECOND EXPERIMENT						
Oct 13–14, 1941	23	93 96*	92 00	− 1 96	21 86	20 54
,, 20–21 ,,	20	89 5*	87 75	− 1 75	20 84	18 74
,, 27–28 ,,	6	96 17	91 17*	− 5 0	19 4	16 62
Nov 3–4 ,,	12	95 33	89 08*	− 6 25	17 54	17 26
,, 10–11 ,,	16	99 81	91 69*	− 8 12	16 42	18 69
,, 17–18 ,,	9	95 33*	91 44	− 3 89	17 93	17 65
,, 24–25 ,,	16	97 94	92 94*	− 5 0	15 77	15 16
Dec 1–2 ,,	21	99 86	88 67*	−11 19	13 06	12 86
,, 8–9 ,,	32	86 84*	85 44	− 1 4	17 51	17 42
,, 15–16 ,,	19	102 79	93 84*	− 8 95	13 62	20 16
,, 23–24 ,,	11	93 82*	91 55	− 2 27	16 76	15 08
,, 29–30 ,,	12	105 75*	97 83	− 7 92	10 13	16 25
Jan 5–6 1942	7	102 0	97 0 *	− 5 0	15 74	16 41
,, 12–18 ,,	23	97 87	90 26*	− 7 61	19 21	19 76

* Version given first

Excluding the last 10 cases, there are 176, half of whom did the B version first and half second When their scores are combined, the influence of practice is excluded, and the average observed change must be due either to an absolute difference in the IQs obtained from the A and the B versions of the test or to the effect of the drug (or a *combination of both)* On the A form the average and standard deviations are 91 40 and 17 51, on the B form 82 88 and 18 45 The drop of 8 52 points in the B version is 4 4 times its standard error, and therefore too great to be attributable to chance

Second experiment —At the start of the investigation it was presumed that the A and B versions would give equivalent IQs and that any observed difference would be directly due to the drug But it was decided to check this by testing whether there was any absolute difference in the IQs from the two forms The same routine was followed except that inert tablets were given on both occasions The results are shown in the table

Excluding the last 13 cases, there are 214, half of whom did the A form first and half second On the A form the average and standard deviations are 95 95 and 18 34, on the B form 90 79 and 17 99 The drop of 5 16 points is 2 94 times its standard error, and is therefore too great to be attributable to chance

DISCUSSION

Clearly a like amount of the observed drop under amytal can be attributed to the initial difference between the A and B versions of the test, and only the balance, 3 36 points, need be attributed to the effects of the drug Is it large enough to be significant? The difference of 8 52 between the average score on the A version and the B version under amytal is also the average of 176 varying differences observed in individuals' pairs of scores This range of differences has a standard deviation of 10 92 The corresponding SD of differences without amytal is

---

[1] Cattell, R B Cattell Intelligence Tests, London, 1939 Scale II, form A and form B, and handbook

---

DR ROBERTSON REFERENCES

Continued from previous page

1 Robertson J D (1941) *Lancet*, ii, 97
2 — (1941) *Ibid*, p 129
3 — (1941) *Ibid* p 216
4 — (1941) *Ibid* p 156
5 Hunter, D and Turnbull, H M (1931) *Brit J Surg* 19, 203
6 Bauer, W, Albright, F and Aub, J C (1930) *J clin Invest* 8, 229
7 Bassett, S H (1935) *J Nutrit* 9, 323
8 Garlock, J H (1936) *Ann Surg* 108, 347
9 Beaumont, G E, Dodds, E C and Robertson, J D (1940) *J Endocrinol* 2, 237
10 Bauer, W, Albright, F and Aub, J C (1929) *J clin Invest* 7, 75
11 Aub J C, Bauer, W, Heath, C and Ropes, M (1929) *Ibid*, p 97
12 Hansman, F S and Wilson, F H (1934) *Med J Aust* i, 37
13 Sherman, H C, Wheeler, L and Yates, A B (1918) *J biol Chem* 34, 383
14 Gillett, L H and Pope, M H (1918) *Ibid*, 34, 373
15 Robertson, J D (1941) *Nature, Lond* 148, 724
16 — (1941) *Lancet* ii 795
17 Kummer, R H (1917) *Rev med Suisse rom* 37, 439
18 Plummer, W A and Dunlop, H F (1928) *Proc Mayo Clin* 3, 119
19 v Recklinghausen, F (1891) Festschrift für Rudolf Virchow, Berlin
20 Albright F, Bauer, W and Aub, J C (1931) *J clin Invest* 10, 187
21 McCullagh, E P (1928) *Arch intern Med* 42 546
22 Wade, P A (1929) *Amer J med. Sci* 177, 790
23 Towles, C (1910) *Ibid*, 140, 100
24 Puppel I D Klassen, K P and Curtis, G M (1939) *J Amer med Ass* 112, 1104
25 Thomson D L and Collip, J B (1932) *Physiol Rev* 12 309
26 Golden, R and Abbott, H (1933) *Amer J Roentgenol* 30, 641
27 Hunter, D (1930) *Lancet*, i, 947
28 Cope, C and Donaldson, G H (1937) *J clin Invest* 16, 329
29 Aub, J C (1928-29) *Harvey Lect* 24, 151.

s a primary paratyphoid B meningitis Infants are eculiarly liable to meningitis during the invasion period f infections which in older children and adults usually ocalise elsewhere primarily The evidence that the case s primary lies in the history, the presence of, normal tools from which repeated cultures were negative and he low positive agglutination titre A supporting point s the fact that there were 3 other children and 2 adults iving mainly in one room under very dirty conditions and yet all remained well The apparent rarity of either type of paratyphoid B meningitis has already been commented on In paratyphoid B fever the organisms are even more numerous in the blood than in typhoid fever, and suppurative lesions are not uncommon Purulent meningitis is, therefore always a possibility and it is not unlikely *that it is commoner than records* show, particularly where the enteric infections are endemic

Clinically there were no special features in relation to the meningitis except that the onset was less acute than one would have expected and that neither patient appeared as ill as the CSF revealed that they were This made the assessment of benefit derived from chemotherapy difficult but it is noteworthy that both patients recovered from a disease of notoriously high mortality and that two members of the sulphonamide group of drugs were tried in each case Drug and dosage were a matter of experiment It is true that claims have been made in support of chemotherapy in typhoid and paratyphoid fevers but bearing in mind the natural variability in the course and duration of both diseases the results are not convincing In addition the danger of agranulocytosis in these leucopenic fevers has been emphasised Generally speaking in diseases for which the sulphonamides have proved of value the response to adequate dosage is prompt and striking I decided, therefore, to give a fairly big dose but not to prolong the course if there was no obvious benefit From the temperature records it may seem that the therapy was effective, but this was not supported by the condition of the patients It was possible to culture the organism from the CSF in both cases after a course of sulphapyridine and sulphathiazole, and in case 1 the fluid only became normal 6 weeks later It is reasonable to argue that the amount of sulphathiazole given (7 g to case 1 and 3 g to case 2) was inadequate Serial estimations of blood and cerebrospinal sulphonamide levels and periodic leucocyte counts would have been of value in estimating if the dose was adequate and safe The only leucocyte count done was in case 1, 24 hours after stopping treatment, when it was 9400

The relapse of case 2 is interesting , similar recrudescence is known to occur in other diseases for which the sulphonamides are almost specific The reason usually given is inadequate dosage Katsampes and Bradford (1940) gave 1 g of sulphapyridine daily for 19 days to an infant a month old with salmonella meningitis yet a relapse occurred 3 months after the onset of the original attack.

Though it is becoming customary to reduce the number of lumbar punctures to a minimum 9 punctures were done in case 1 and 7 in case 2 Repeated examination of the CSF, particularly in case 1, was found to help considerably in judging progress and guiding convalescence

SUMMARY

Published reports of paratyphoid B meningitis are few only 7 could be found The condition is probably commoner than records show The fatality in salmonella meningitis generally is high

A primary and a secondary case of paratyphoid B meningitis are reported here Both patients, one aged 8 years and the other 5 months recovered

Sulphapyridine and sulphathiazole were used in both cases Neither drug appeared in any way specific as compared with the effects of sulphonamides in some forms of meningitis, but sulphathiazole is probably to be preferred until some better compound is discovered

REFERENCES

Fahrenburg J H and Ecker E E (1937) *J infect Dis* 60, 81
Caselli E G (1939) *Arch argent Pediat* 10 416
Hageman P O (1938) *Amer J med Sci* 195 487
Katsampes C P and Bradford W L (1940) *J ped* 16 79
Osler W McCrae T (1907) System of Medicine London p 157
Storey, W E (1938) *J med Ass Ga* 27, 472

Medical Societies

ROYAL SOCIETY OF MEDICINE

At the annual general meeting of the section of medicine on May 26, with Dr GEOFFREY MARSHALL the president in the chair, a discussion on

Mineral and Vitamin Requirements and War-time Dietary

was opened by Dr R A McCANCE Net requirements of minerals, he said, had not been altered by the war , the question therefore was are diets today adequate, as satisfactory as before the war and likely to remain so ? Only calcium and iron need be considered Before the war it had been fashionable to represent people as all living on the verge of calcium starvation , a good many women and children and certain men were certainly not getting enough Diets had been much altered by the war Before the war they had been regulated by preference and price , now they were a matter of planned distribution Milk had been taken out of the milk-bars and redistributed practically free to children so that adults were short Some experiments showed that the calcium intake in certain women and children was slightly higher now than before the war ; men were getting slightly less The only children likely to be deficient were those leaving school at 14 and not getting their school milk The position about iron was much the same , there was less meat but far more iron in the bread The question was . were these minerals as well absorbed as before the war ? Experiments had suggested that calcium was not *Brown bread had been suspected of preventing calcium absorption* On diets in which 40–50% of the calories were provided by bread the subject invariably showed a drop in calcium absorption when brown bread was substituted for white The laxative action had been eliminated as a cause the other possibility was the presence of phytic acid which precipitated the calcium Mellanby had shown that cereals and notably brown flour, encouraged rickets in puppies In 1939 Harrison and Mellanby had shown that rickets could be produced by adding sodium phytate to a puppy's diet War-time experiments on man indicated that if phytate were added to white bread there was a big drop *in calcium absorption*—even sometimes a negative absorption was produced with more calcium in the fæces than in the food Magnesium was affected in the same way Iron especially ferric iron had also a very insoluble phytate and the same drop in absorption appeared in changing from white bread to brown There was an enormous increase in intake and an enormous drop in absorption This work required repetition, but the result with calcium was quite certain Addition of calcium carbonate to bread precipitated all the phytic acid and further calcium added became available for absorption It was not easy to remove the phytic acid but it was possible When bread so treated was eaten the absorption of calcium was improved but was never so good as from white bread because the phosphates remaining interfered with the absorption of calcium If the phosphates were removed as well as the phytic acid the calcium absorption closely approached that from white bread Magnesium always did the same thing as calcium Dephytinising was not commercially possible for the whole country though it was practicable for patent foods Addition of calcium to bread therefore seemed the only solution The present 85% loaf had about half as much phytic acid as the 92% bread used in the experiments The addition of calcium did not seem to call for discussion , the evidence for it was sound It was pathetic to think that arteriosclerotics could have so little judgment as to think this measure would affect them unfavourably.

Prof R A. PETERS showed X rays illustrating the effect on a man of 53 of 13 months consumption of an 85% loaf with prepared chalk added , no evidence of calcification was present

Mr L J HARRIS D Sc said he had tested groups of people to ascertain if their nutritional status had deteriorated or not since the war He had particularly used the saturation test with a view to establishing a quantitative index It was now possible to demonstrate the effects

PARATYPHOID B MENINGITIS

TWO CASES WHICH RECOVERED

W H PATTERSON, M D BELF, D C H
MEDICAL SUPERINTENDENT OF BOOTH HALL CHILDREN'S HOSPITAL, MANCHESTER

THESE cases are reported because meningitis due to paratyphoid B is apparently rare, the fatality of the small number of cases recorded is very high, and the use of sulphonamides is of topical interest Purulent meningitis occurring as a complication of typhoid fever in the 3rd or 4th week of the disease has been described in text-books for over 30 years (Osler and McCrae 1907), but it is usually referred to as " very uncommon " Fatality-rates given vary between 50 and 100% Hageman (1938), reviewing the literature, found 50 cases of purulent typhoid meningitis described and all had died Bahrenburg and Ecker (1937) found that in 1908–37 meningitis due to members of the salmonella group had been reported in 34 cases Only 20 of these records were complete enough to be classified, and *Bacterium paratyphosum B* was the causative organism in 5 The high fatality (19 out of 20 died) led them to conclude that " salmonella meningitis must, therefore, be considered fatal until more evidence to the contrary is produced " Storey (1938) and Caselli (1939) have each reported one case of paratyphoid B meningitis Storey's patient recovered but it has not been possible to refer to either original article Katsampes and Bradford (1940) record meningitis in an infant, due to *Salmonella panama* Their patient recovered This was among the earliest of such cases in which chemotherapy (sulphapyridine) was used

CASE-HISTORIES

CASE 1 —A boy of 8 years was admitted to hospital on Aug 12, 1941, with a diagnosis of endocarditis Had been ill for 6 days with fever, cough and constipation Nothing of note in history Rest of family in good health Temperature 102° F, pulse rate 108, moderately ill, heart normal, spleen just palpable Aug 15, Widal positive for paratyphoid B and stool culture grew the bacillus Aug 21 (15th day of disease) headache Aug 23 fully conscious, rational, and cooperative Neck rigidity Lumbar puncture produced obviously purulent cerebrospinal fluid, cells found to be nearly all polymorphonuclear, paratyphoid B cultured from fluid Sulphapyridine begun (18th day of disease, 3rd day of meningitis), initial dose 1 5 g, 6 doses of 1 g, 4 doses of 0 75 g, 3 doses of 0 5 g Total given in 56 hours, 12 g After 10 g CSF still grew paratyphoid B Aug 25 no striking change, sulphapyridine stopped Aug 27 pyrexia unchanged, CSF turbid, culture negative Aug 28 after 64 hours without chemotherapy, sulphathiazole, 7 g, given in next 55 hours Aug 30 fever lower, neck still rigid Aug 31 clinical improvement, CSF turbid, *Bact paratyphosum B* present on culture Sept 1 blood count, white cells 9400 (polymorphs 52%) Sept 4 neck rigidity absent, fever finally settled, CSF opalescent but negative on culture in this and all subsequent specimens By Sept 10 he was clinically well CSF remained abnormal, and fæces positive for the bacillus up to Oct 5 Oct 12 normal CSF obtained Oct 17 discharged Three months later appeared normal in every way

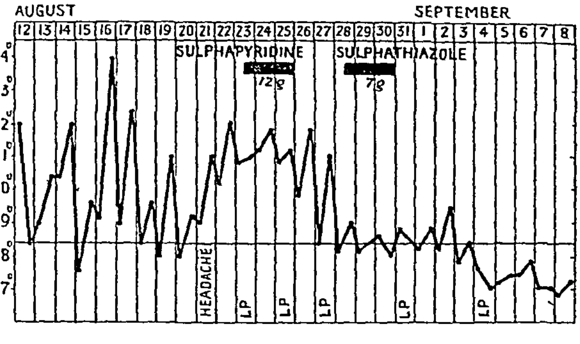


FIG 1—Temperature chart in case 1 LP = lumbar puncture

CASE 2 —A girl of 5 months was admitted to hospital on Sept 20, 1941, because of convulsions Had been vaguely ill for 6 days and had vomited daily during this time normal and not frequent First convulsion on before admission Nothing relevant in history, rest family well T 100° F, pulse rate 144, irritable, resistance to neck flexion, fontanelle bulging, spleen palpable Lumbar puncture produced opalescent CSF which gram negative bacilli were numerous and proved to *Bact paratyphosum B* on culture Sulphapyridine 2 hours after admission, 11 25 g given in 80 hours

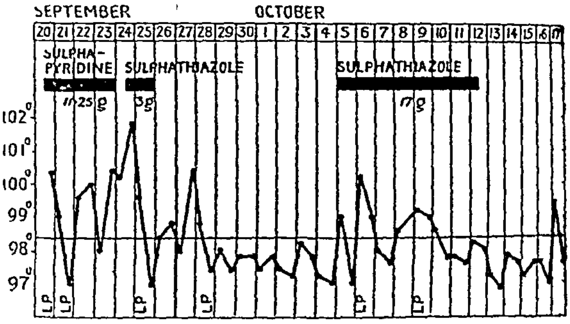


FIG 2—Temperature chart in case 2

on Sept 24 and sulphathiazole substituted, 3 g being given in next 24 hours Sept 23 Widal reaction positive for paratyphoid B Sept 26 clinical improvement not striking; much neck stiffness, CSF turbid but no organisms cultured Sept 28 temperature normal, blood culture sterile after 5 days incubation Sept 29 CSF turbid, *Bact paratyphosum B on culture* Oct 1 *condition unsatisfactory* though temperature normal Oct 5 fontanelle tense, temperature raised again Oct 6 CSF heavily bloodstained (traumatic), no organism on culture, sulphathiazole begun again and 17 g given in next 7 days Oct 9 convulsions Oct 10 temperature again settled Oct 13 still ill, definite neck stiffness Oct 14 improved, good progress from this date Dec 12 discharged Seen 6 weeks later, aged 9 months, seemed normal for age No signs of organic trouble in the central nervous system

Bacteriology —The CSF was cultured on MacConkey's medium and also in brilliant green broth After culture overnight the brilliant green broth was subcultured on to eosin brilliant green agar Colonies picked off from both the MacConkey's medium and the eosin brilliant green agar gave typical fermentation reactions and agglutinations to titre with the Oxford standard *Bact paratyphosum B* H serum

Widal reaction in case 1 after 24 hours was *Bact typhosum* H, nil, *Bact paratyphosum B*, H, 1 in 10,240, *Bact paratyphosum B* O, 1 in 320, salmonella 1 in 2560 In case 2 *Bact typhosum* H, nil, *Bact typhosum* O, nil, *Bact paratyphosum B* H, 1 in 80, *Bact paratyphosum B* O 1 in 80, salmonella, nil, organism from patient's CSF, 1 in 40

FINDINGS IN CEREBROSPINAL FLUID

Case no and date	Cells per c mm	Globulin	Protein (mg per 100 c cm)	Chlorides (mg per 100 c cm)	Culture *Bact paratyphosum B*
Case 1					
Aug 23	Purulent				+
25	,,				+
27	Polymorphs 95 %		60	646	−
31	Turbid				+
Sept 4	537	Excess	40		−
11	140	,,	30	708	−
22	176	,,	40		−
Oct 5	33		30	740	−
13	4	No excess	20	742	−
Case 2					
Sept 20	870 (polymorphs 60 %)		80	640	+
21	Purulent				+
26	,,				−
29	240				+
Oct 6	Blood stained				−
10	Blood present		50		−
24	,,				−

DISCUSSION

Case 1 is an example of meningitis occurring during the course of paratyphoid B fever Case 2 can be classified

The other things depended on other factors of nutrition as well An increase of 5 mg of iron per day per person in this country would only require an extraction of 80 tons a year of iron ore, and would be entirely simple A person in a state of permanent unsaturation must be more likely to step over into deficiency than another person, no more could be or had been claimed The individual prewar brown bread consumer was not relevant, brown bread was not necessarily war bread The most popular brown bread was a mixture of white flour and wheatgerm, and most of the phytin was in the bran, not in the germ There was a good deal of loose terminology in this sphere Brown bread must not be identified with wholemeal bread or even with bread of high extraction

Dr McCance, in reply, said that requirements had to be defined in terms of the diet and particularly of the cereal eaten, and individuals varied enormously He had never been in calcium balance during a two years' diet of brown bread It was easy to find out an individual's calcium requirements but very difficult to assess the requirements of a population Calcium could be added to brown bread to make it a neutral product, like white bread, or to make it a source of calcium The present proposal did the former only Evidence from individuals was useless, a man who got 70% of his calcium from other sources naturally would never show calcium deficiency as a result of changing from white bread to wholemeal

---

SOCIETY OF MEDICAL OFFICERS OF HEALTH

At a meeting of the Fever Hospital Medical Service group of the Society of Medical Officers of Health on May 8, with Dr E H R Harries in the chair, a discussion on

Recent Improvements in the Preparation of Antitoxins

was opened by Mr L F Hewitt, Ph D He recalled that unprocessed antitoxic serum with its low potency and its tendency to produce severe serum reactions was first superseded by antitoxic globulins from which a considerable amount of inert protein fractions had been removed With this material and the improvements introduced from time to time more potent antitoxins became available and the incidence of severe serum reactions was greatly reduced. More recently enzyme-treated antitoxins have been developed, in which not only have inert proteins been removed but the antitoxic proteins themselves have been split into active and inert fractions This result was obtained by proteolytic enzymes such as pepsin acting under conditions in which the proteins were disaggregated into smaller molecules without allowing true digestion into peptones and amino-acids The antitoxin thus produced was of high potency and possessed other advantages, including rapidity of absorption, slow disappearance from the body and a reduced tendency to cause serum reactions or sensitisation even when administered in massive doses There is no evidence of the absence of any essential factor from this enzyme-treated material Recent laboratory work on diphtheria has failed to reveal any other antibody necessary for treatment—for example late diphtheritic paralysis in animals has been shown to be due to ordinary diphtheritic toxin and to be prevented by early administration of antitoxin Factors have recently come to light explaining the high toxigenicity of gravis strains of *Corynebacterium diphtheriæ* in patients and their comparatively low toxigenicity in the usual artificial culture media The culture media usually employed are deficient in iron and strains other than gravis produce potent toxins, but when the iron content of the medium is increased to a level comparable to that obtaining in the throat the toxigenicity of gravis is still considerable while that of other strains is greatly reduced, thus providing an explanation of the clinical findings Dr Hewitt urged the importance of obtaining clinical reports on the new antitoxin preparations

Dr E H R Harries said that reactions so rarely follow the injection of these refined products that it is difficult to find serum rashes to demonstrate to students He is coming to the conclusion that, provided all or part is injected intravenously, doses in excess of 50,000 units are seldom required

Dr H J Parish said that experiments in the laboratory have shown that there are wide differences between strains of *C diphtheriæ* in respect of toxigenicity and virulence These variations may explain why antitoxin is more effective in some cases than in others It is not always realised that many valuable hours can be gained and expense saved by administering antitoxin intravenously A relatively small dose given intravenously so as to be immediately available is more useful than many times the unitage given intramuscularly Antitoxin neutralises toxin in the circulation but cannot deal with toxin already fixed to the cells of the body Is antitoxin less effective unit for unit today than before the introduction of refined serum, and has it become qualitatively different since the early days of serum therapy? Dr Parish recalled that there was a tendency some years ago to employ a very high therapeutic dosage—e g, 300 000 units intravenously—but he was told that in one hospital equally good results were obtained with 50,000 units or less This does not suggest that antitoxin has become "weaker" but is it general experience?

Dr L J M Laurent said that with modern concentrated antitoxin there are still two problems requiring solution first, the rigors after intravenous injections which are not due to serum hypersensitiveness and seem associated with certain batches of antitoxin, secondly, the delayed response of some severe cases of diphtheria to antitoxin, even when adequate intravenous doses are given early Variations in the infecting strain, in the patient's susceptibility and in some hypothetical 'avidity' factor in antitoxin have been put forward in explanation, but no explanation accounts for all the facts This occasional delayed response to antitoxin was well known twenty years ago when only natural serum was used His experience of those days did not bear out the view that improvement was then more rapid than it is now

Dr H S Banks said that serum sickness as well as the anaphylactoid reaction following intravenous injection are practically abolished by the use of "digest" concentrated antitoxin The thermal reaction which arises about half an hour after intravenous injection was produced by earlier batches but not by those now in use Some recent cases of apparently simple tonsillar diphtheria treated with as much as 40 000 units intravenously on admission progressed to the "bull-neck" stage with extensive palatal membrane and œdema within 12–24 hours Such cases are however, rapidly controlled by a further injection of 100,000–150,000 units intravenously Although there is sometimes a time lag in its action, large intravenous doses of the new antitoxin, repeated if necessary, can be relied on to effect a rapid cure of the early hypertoxic case of diphtheria, often without paresis or other complications

Dr Maurice Mitman said that for some years he has regarded thermal reactions—rigor and collapse—as fundamentally different from the antigen-antibody reaction responsible for serum disease, chiefly because a serum rash may appear 7–10 days after the administration of serum to a patient who had a rigor 20 minutes after the injection If thermal reactions have materially diminished in frequency with protein disaggregated serum some light may be thrown on their ætiology. In diphtheria he does not regard the extension of local manifestations within 24 hours of the administration of serum as positive proof of the failure of serum The appearance of membrane is an end-result of a biological process which may have begun before the serum was given, at the time of administration there may be little or no clinical evidence that the mucosa is affected He thought some generally acceptable simple nomenclature for the different sera is desirable, such terms as "refined sera" are being used for both concentrated and protein disaggregated sera and there may be confusion

Mr C G. Pope, B Sc, drew attention to the difference in time required to purify and concentrate antitoxic sera by the old ammonium sulphate method compared with the newer enzyme-heat denaturation method In the old method, technical difficulties due to poor filtration of the ammonium sulphate fractions made the process a lengthy one and some degree of bacterial of subclinical deficiencies Changes in individuals were not seen, but the analysis of the group as a whole revealed statistical differences The minimal absorption of a vitamin produced obvious clinical symptoms, the optimal promoted maximal health, and there was an appreciable gap between the two In animals vitamin-C deficiency short of scurvy produced diminished growth rate, failure in production of new tissues (e g , teeth or wound healing) and increased liability to infection These applied also to human beings, although this was a controversial issue One thing against it was the work of Fox in South Africa, who studied a group of miners on 12–25 mg of ascorbic acid a day A few of these actually developed scurvy, but there was no evidence that the health of the group as a whole was worse than that of another group receiving supplementary vitamin C over a 7 months period The second argument was Crandon's experiment on himself, in which he showed no failure to heal artificial wounds and developed no infection on a vitamin-C-free diet for several months But this was only one subject, another on a diet deficient in vitamin C developed whooping-cough with severe complications A number of recent publications at home and abroad supported the belief that addition of vitamin C to the diet led to better growth and increased resistance to infection Tonsillitis was cut short and its complications did not arise, and dental and surgical wounds healed better Tests to measure the level of nutrition were valuable because vitamin deficiency might appear suddenly if the levels were not being watched, and because general levels of nutrition in war-time could be followed Test doses of vitamin were given to see how many days the subject took to reach the plateau of excretion There was relatively little scatter, delay was proportional to the deficiency in the previous diet Children of well-conducted institutions were still better off than children in poor homes, but there was a drop all round in vitamin C, owing to the shortage of fruit After the summer, however, nearly all groups were up to a satisfactory figure Care was needed in providing vitamin C during the winter Dark-adaptation could be made a specific and reliable test for vitamin-A deficiency, about 9% of the children in an institution, about 15% of children in homes, and 18% in village homes had a subclinical deficiency which could be put right by administering vitamin A Slit-lamp examination of the cornea for vascularisation of the limbus showed that 6% of Cambridge children had riboflavin deficiency, but children showed this sign less than adults

Dr H M **Sinclair** thought the whole subject was very difficult as there was so much conflicting evidence to be weighed up He asked whether the iron situation was satisfactory We regularly threw away a great deal of iron by separating plasma at blood-transfusion centres could not some of that be added to bread ?

Dr A P **Meiklejohn** also asked about addition of iron as he thought hæmoglobin levels were now commonly rather low In a recent survey in Lancashire a random sample of young married women had a level of about 76% He also asked Dr Harris to define subclinical deficiency more precisely There was undoubtedly a period of vague ill health between the institution of an inadequate diet and the appearance of definite deficiency symptoms, but it seemed dangerous to assume that a patient in a state of suboptimal nutrition was necessarily suffering therefrom It was easy to collect a group of people with lassitude and insomnia, they had no bromide in the urine but were not necessarily suffering from bromide deficiency It was very difficult in practice to apply vitamin-deficiency tests Correlation between results of test-dose experiments and the clinical side was needed

Dr **Harris** replied that the balance of evidence suggested that resistance to infection was affected, the fact that one group did not show this was neither here nor there A negative result did not necessarily prove anything, whereas a positive result did A group had subclinical deficiency if, as a group, they showed improvement on increased vitamin dosage, individuals might not show anything The saturation test enabled the observer to determine the relative position of the group, he had never said that saturation was necessary

Dr R A **Murray Scott**, speaking as a practitioner among specialists, said that his co in Leeds had been seeking effects of faulty w diet They had decided that anæmia was the most identified defect There seemed to be a definite inc in anæmia in the country, especially among wo Medical students had shown 100–105% hæmoglobin the commonest reading for six years before the last year the largest group had been 90–95%

Dr **Geoffrey Evans** believed there was a cer amount of mineral and vitamin deficiency today, e allowing for the psychological action of vitamin ministration He had been struck by the response acne rosacea with conjunctivitis and keratitis to r flavin, 3–6 mg daily Some who suffered from lack power of concentration found real benefit from vita B He was much impressed by the number of peo who had low hæmoglobin values—80% or less—and obvious benefit conferred by bringing it to a m normal level We should not be iron-conscious, vi conscious and so on, but food-conscious Diffe people, and perhaps different families too, had diffe powers of assimilating these substances He knew family of six with definite evidence of muscular hypoto on a diet undoubtedly adequate in vitamins, there been much improvement in many directions from gi calcium and vitamin D Enormous doses of the f soluble vitamins could cause real poisoning therapeu doses must be given

Prof J R **Marrack** had estimated the vitamin in many meals in British Restaurants and canteen In the former he found over 20 mg per meal in Londo but in Bishop's Stortford in March it never reached tha and was under 10 mg in a third of the meals In th schools, a third of the dinners supplied under 10 mg an a third over 20 mg, with a maximum of over 60 mg Saturation tests confirmed the meal analyses The tes was comparable with the urea-concentration test The worst vitamin-C supply was in a school with a rathe poor cook where the headmaster grew potatoes only In the school with best meals the headmaster was enthusiastic gardener, and there were large supplies o green vegetables On the full diet in a hospital he ha investigated patients managed fairly well, but the ligh diets in the same hospital supplied less than 10 mg o ascorbic acid on five days out of twelve, and never mor than 30 mg daily He had been surprised to find him self feeling better and less tired on a diet high in vitamin C

Dr H E **Magee** said that the word minimum di not appear in the League of Nations recommendations The Ministry of Health had been criticised, especi ally with reference to cod-liver oil On the advic of the Medical Research Council it had accepted th League's 1938 standards The standards had been se up by methods which were not clear-cut and definite, a protein and mineral standards had been It was not matter of balance where intake and output were de termined, but of the recognition of diseased states Th standards were therefore speculative, and much signi ficance should not be attached to specific figures

Mr W R G **Atkins**, Sc D, F R S, pointed out tha there were traces of nearly all the elements in seawater and food coming from the sea might be expected t contain substances not present in inland foods Ther also might be substances in the soil, such as manganese preventing the absorption of iron He had carried ou experiments on a number of men In one case 50 men fed from the same kitchen showed differences of saturation according to whether they had their vitamin tablets before or after breakfast How long did it take for a change from one diet to another to affect a man ? Of 100 men tested lately, 40 had been done ten months ago and left saturated then Yet these 40 showed no quicker saturation than the others Obviously if they normally stored 7–8 g this would not be so It appeared that the man who had a big supply got rid of it very quickly

Mr A L **Bacharach**, B Sc, thought only one logical conclusion could be drawn from Fox's experiments that ascorbic acid reduced the risk of scurvy and did nothing else That however, did not prove that the vitamin had no other effects The state of nutrition of these natives was such that the only thing vitamin C could do for them was to reduce the incidence of scurvy

THE LANCET

LONDON SATURDAY, JUNE 6, 1942

COURAGE TO ORDER

A MILD manic-depressive cycle is apparent among a high proportion of normal people, and most creative work of the first order is done in short bursts of mental exhilaration that come as mysteriously as they disappear It is therefore not surprising that man has never ceased to search for the means to summon at will these brilliant interludes in what is often an all too drab existence In modern warfare the search assumes even greater importance Blitzkrieg makes enormous demands on the shock-trooper's mental and physical reserves If a drug could be found that would facilitate the association of ideas and thereby increase initiative without impairing judgment, abolish fatigue and the desire for sleep for about 48 hours, and yet produce no harmful effects such as incoördination that might impair accuracy in shooting, the discovery would go far towards completing the revolution that we are seeing in military strategy

Alcohol has a time-honoured reputation as a cerebral stimulant, and though its cause (within narrow limits) has been championed by reputable pharmacologists,[1] the general opinion is that alcohol should be eschewed by a soldier who has at the same time to exercise careful judgment and endure prolonged physical exertion For relieving the sense of fatigue after the ordinary exertions of the day's work caffeine in the form of tea or coffee stands alone, notwithstanding the theoretical disadvantages of the continued use of a cerebral stimulant over a long period When it is taken in large doses, however, to obtain a more long-lasting and intense stimulation, side effects are apt to be troublesome, especially palpitation due to direct stimulation of the heart muscle, and the diuretic action may also be inconvenient The disadvantages of large doses of caffeine apply even more to the other xanthine derivatives, theobromine and theophylline Nevertheless there can be no doubt that when they are skilfully used these drugs still rank high among cerebral stimulants The action of cocaine serves to remind us that we demand of cerebral stimulants something more than excitement and increased staying power These effects are achieved at an exorbitant price when the power to reason is simultaneously impaired, for the delirifacient that suits the artist might become a menace in the hands of a commando The advantages and disadvantages of particular drugs are often enumerated but the distinction is arbitrary, and the lists are often interchangeable according to the object we are trying to achieve Thus cerebral excitation and consequent insomnia are the principal disadvantages when ephedrine is used for its sympathicomimetic effect, as in the treatment of enuresis and asthma On the other hand, when it is used as a cerebral stimulant the converse becomes true—that often the effect is achieved only with the troublesome complications of retention of urine, dysuria or even painful micturition The chemical structure of ephedrine, however, provided a clue for the synthesis of amphetamine sulphate ('Benzedrine Sulphate') which has carried us a step further in the search for a potent but non-toxic cerebral stimulant Its usefulness has been proved in a variety of clinical conditions including postencephalitic parkinsonism, narcolepsy, psychoneuroses characterised by depression, and arterial hypotension As a cerebral stimulant for soldiers, however, it is not sufficiently powerful Thus, SARGANT and BLACKBURN[2] recorded only an 8% increase in intelligence-test scores following amphetamine, with a 7 to 1 chance against this apparent improvement being fortuitous Furthermore, amphetamine is not sufficiently selective if we judge by the toxic effects which have been reported on other parts of the body ANDERSON and SCOTT[3] have drawn attention to its untoward effects on the cardiovascular system, including vasomotor instability with fluctuations in blood-pressure and pulse-rate and among six patients collapse, heart-block and anginal pain were noted With the deftness of a modiste re-modelling last year's hat, the pharmaceutical chemist has created 'Methedrine' (BWCo), which differs from amphetamine in having an additional methyl group and from ephedrine in having no OH group The indications and contra-indications for its clinical employment are much the same as for amphetamine It is not yet clear whether it is better than amphetamine as a temporary stimulant to enable the soldier to endure exceptional strain over a period of 2 or 3 days, but the pressor effects and the action on the gastro-intestinal tract are sufficient to warrant caution EICHHOLTZ[4] has reviewed the pharmacology of its German version, called 'Pervitin' Experiments suggest that this drug speeds up the association of ideas to such an extent that the executive part of the brain is unable to cope with the torrent of fresh mental concepts Unfortunately the drug also produces an obsessional urge which may interfere with the carrying out of a prearranged plan, and doses only slightly exceeding the optimum are liable to cause disorientation and hallucinations This is regrettable, for Caliban was never an asset to parties of saboteurs and dynamiters Furthermore, strong sympathomimetic effects so familiar in its predecessors are still a bugbear, and another dominant strain which bespeaks the amphetamine lineage is a tendency to cause addiction

In war a reduction in fear, if it can be attained without too great a sacrifice of mental efficiency, is often as useful as intellectual stimulation, and on another page SLATER, SARGANT and GLEN describe an investigation into the effects of sodium amytal, gr 1–3 of which produces relative mental calm for some four hours, without, apparently, more than a slight impairment of mental powers as measured by Cattell intelligence tests In military strategy the usefulness of mental soothers or stimulants will always depend on accurate timing of operations, and the dangers from side-effects and after-effects in unusually susceptible individuals are likely to remain an anxiety to the commander who employs these drugs The keen interest which the Germans have taken in them was revealed after the battle of Crète, and when the history of the war is being written the Germans may contamination was almost unavoidable , by the newer method, which has been highly mechanised it is possible to begin the concentration of 300 litres of plasma one day and to have the process complete by about the end of the next day This improved technique may account for the reduction in the pyrexic reactions seen when enzyme-refined serum is employed

---

[1] See *Lancet* 1941, i 575

[2] Sargant W and Blackburn J M *Ibid* 1936 ii, 1385 annotation p 1475

[3] Anderson E W and Scott W C N *Ibid*, p 1461

[4] Eichholtz F *Dtsch med Wschr* 1941 67, 1355

Dr **ROBERT CRUICKSHANK** supported the evidence that in toxic diphtheria a local worsening of the infection may occur during the 24 hours after an apparently adequate dose of refined antitoxin has been given intravenously The swelling of the neck glands and tissues is probably associated with an invasive property in the gravis and intermedius strains responsible for severe infections In fatal cases these types of the diphtheria bacillus can be isolated from both cervical and mesenteric glands which show inflammatory and necrotic changes, and antitoxin is apparently unable to counteract this invasive factor in the bacillus He wondered, too, if over-refinement may not reduce " avidity " although little seemed to be known about this property in antitoxin In prophylaxis, more rapid absorption will necessitate a longer interval between the Schick test and the prophylactic dose if a reliable reading is to be obtained He asked whether the very small volume of the prophylactic dose may result in more rapid elimination and hence a shorter period of protection

In reply, Dr **HEWITT** observed that it seemed apparent from the clinical results described that enzyme-treated antitoxins met with the general approval of clinicians These newer preparations are clearly a definite improvement on previous antitoxins, though it seems likely that if there is close cooperation between clinicians and serum laboratories continued improvement can be anticipated

Reviews of Books

Native African Medicine

GEORGE WAY HARLEY, M D Cambridge, Mass Harvard University Press, London Humphrey Milford, Oxford University Press Pp 294 20*s*

MANY people pass their lives among interesting material without noticing it , the few find in their surroundings a constant stimulus to observe and record Dr Harley is one among these few After ten years residence as a medical missionary among the Mano people of Liberia he has written an informative book on the practice of " medicine " by this tribe, of interest alike to anthropologist, psychologist, pharmacologist and physician

The African native is born into a world in which the struggle for existence is unending , every object in his environment, animate and inanimate, he endows with specific qualities, a kind of quintessence which may be used for good or ill It is man's object to gain control of the power which all objects exercise Any object thus under control is " nye " or medicine, while " wi " is the power on the part of the individual to use and control such objects Dr Harley discusses these basic conceptions and their evolution and shows how " medicine " governs the whole of the native's life, being invoked to prevent and cure disease, to turn aside misfortune, to overcome an enemy, and for the practice of black magic The native looks for a cause behind every effect and " makes medicine " to meet the situation Among the chapters of particular interest to the anthropologist are those on the initiation ceremony for boys, associated with the idea of rebirth from out the belly of the great crocodile, on divination, and on secret societies and guilds including those of medicine-men The sections on treatment of disease are exceptional in that every plant mentioned has been identified and referred to a botanical list

Diseases of the Heart

(3rd ed) Sir THOMAS LEWIS, M D, F R C P, F R S London Macmillan and Co Pp 297 15*s*

IN writing this book for practitioners and students Sir Thomas Lewis did the profession a great service, in no other work is there a clearer perspective or more succinct description of the basal principles of cardiology The emphasis is on the observation and interpretation of physical signs, and consideration of the instrumental methods—electrocardiography and radiography—is deliberately kept to the minimum book is now larger than earlier editions owing to the of thicker paper Only very slight alterations have made in the text , it may indeed be asked if some sections could not have been brought a little more up to date—for example, in the section on the thyrotoxic state by more emphasis on the common type in middle-aged women in which the eyes are not prominent, and with which the cardiologist is particularly concerned

Manual of Otology, Rhinology and Laryngology

HOWARD CHARLES BALLENGER, M D, F A C S, assistant professor of otolaryngology, Northwestern University School of Medicine, Chicago London Henry Kimpton. Pp 302 18*s*

Dr Ballenger is well known for his share in the larger work which bears his name In his preface to this manual he describes it as an abridgment of the older book, meant especially for undergraduates This sort of statement in authors' prefaces is apt to mean little the book dedicated to advanced students and general practitioners can often only be appreciated by the specialist , but Dr Ballenger is trustworthy His book is brief, compact, well illustrated and printed, and on the whole accurate Descriptions of operative technique are omitted, although the type of operative treatment is indicated and stress is laid upon its intention and scope Similarly, although unusual conditions are described they are placed in reasonable perspective The student should have no anxiety lest he is being asked to digest unnecessary provender The practical, balanced, sane outlook of the whole book is pleasing , for instance, the categorical statement, in the account of atropic rhinitis, that " the treatment is essentially that of intranasal cleanliness " is a refreshing sentence at a time when much is uncritically written about treatment with sex hormones

Bibliographica Primatologica

A classified bibliography of primates other than man T C RUCH, Yale University School of Medicine Springfield, Ill C C Thomas Pp 241 $8 50

COMPILING a bibliography is in itself a labour of love, and often the task of the bibliophile rather than the scientist Ruch has happily combined the functions of both in this important work As Prof J F Fulton points out in his introduction, during the last 25 years the primates other than man have been studied increasingly in the hope of throwing light on human biology The timely classification of material so far accumulated, before its bulk has become overwhelming, is a wise step Even so, between four and five thousand works are described and serially numbered in this first volume Alphabetical classification by authors has been courageously discarded and the arrangement is based on subjects and their *subdivisions* *A list of cross references* at the end of each subsection is designed to give the minimum of labour to the greatest number of users Bibliographically, the book appears to be above reproach Complete information is given about every work cited, and the volume is beautifully produced There is an author index, and the subheadings are skilfully chosen Medical science owes Dr Ruch and his assistants—and his inspirer, Professor Fulton—a debt which will not diminish with time for their years of exacting labour

Year Book of Obstetrics and Gynæcology, 1941

Editors JOSEPH B DELEE, M D , J P GREENHILL, M S , M D , F A C S Chicago Year Book Publishers, London H K Lewis Pp 704 16*s* 6*d*

ONCE again, and in spite of war difficulties, the latest edition of this book has safely reached us This year its value is enhanced by the fact that our own research has been curtailed and by the relative scarcity of medical periodicals from other parts of the world The high standard set by preceding volumes has been more than maintained , it remains a trustworthy symposium of important original papers produced during the twelvemonth, and the occasional editorial comments are always to the purpose A double index—of subject matter and authorship—spares the reader's time and temper being treated and diminish or increase as required. A negative Wassermann, except that it indicates that treatment is being effective is of no permanent value. A positive Wassermann in the cerebrospinal fluid during the first two years is nothing to be alarmed about but if it is still present after the third year it is an indication that the victim is a candidate for late nerve syphilis and he should be treated accordingly. On the continent it is common to complete treatment by giving a course of malaria but this idea has not taken root here. Treatment on these lines should give a much less sombre picture than one taken from statistics of 25 years ago. But there is still no hundred-per-cent cure in this, any more than there is in any other malady.

DIAGNOSIS OF INTESTINAL INFECTIONS

APART from epidemics, a case of typhoid fever is now a rare phenomenon in the experience of any individual doctor, and even when he has the infection in mind its recognition in the early stages is almost impossible on clinical grounds alone. Later the diagnosis may be obvious but a case left undiagnosed until the second or third week of infection may have serious consequences for both the patient and the community. The difficulties of clinical diagnosis are enhanced when paratyphoid fever is in question for here the infection is often mild and atypical especially in the young. Unfortunately there has lately been a considerable increase in paratyphoid which from its very mildness seems likely to spread and become a common endemic infection in this country. If the practitioner is alive to this possibility he may reduce the difficulties of diagnosis by calling in the help of the laboratory early, indeed W M SCOTT[1] maintained that any patient with fever lasting more than three days without obvious explanation required laboratory assistance to confirm or exclude a diagnosis of enteric fever. The popularity of the Widal test for the diagnosis of this group of infections dies hard it is necessary to state again and again that the Widal reaction is not the diagnostic method of choice. Besides its uselessness for early diagnosis its pitfalls have been accentuated by the increasing number of the population who have received prophylactic TAB inoculations. In the first week of infection blood-culture is most likely to give the diagnosis although the practitioner fights shy of doing his own blood-cultures. But if he insists on the Widal test and takes the blood with sterile precautions culture of the clot in bile-broth will often yield the organism.

Bacteriological examination of the fæces has in the past been given only secondary consideration in diagnosis and was said not to yield positive results until the later stages of the infection. HOLT and his colleagues[2] have shown in an outbreak of paratyphoid in Liverpool that examination of the fæces by selective media yielded 89% of positive cultures in the first week of infection while in a total of 446 cases the diagnosis was confirmed by fæcal culture in 92% at the first examination. The lactose-containing media in current use for the isolation of the intestinal pathogens have the common disadvantage that the non-pathogenic coliform bacilli are not inhibited, so that a pathogen must be present in a ratio of 1 100 to *Bacterium coli* if it is to appear as an isolated colony when the fæces are spread on a 4-inch plate. In the past 20 years WILSON and BLAIR[3] have developed a bismuth-sulphite-iron medium which by inhibition of *Bact coli* has greatly facilitated the isolation of the typhoid and paratyphoid organisms but many bacteriologists have hesitated to use this medium because of the difficulties of satisfactory preparation and consequent irregular results. These difficulties were largely solved by the supply of a dehydrated Wilson and Blair medium (prepared by Difco Laboratories) which needed only the addition of water. Import restrictions have temporarily limited supplies of this concentrated medium but the modified formulæ of WILSON and of TABET[4] may be relied on to give good results. Various coli-inhibitory substances have also been used in fluid media for the isolation of the salmonella bacteria. HYNES[5] has compared the relative merits of three of these "enrichment" media containing respectively brilliant green, tetrathionate, and brilliant green plus Esbach's reagent (Ruys's[6] medium), and has confirmed that preliminary inoculation of the fæces into these media followed next day by plating on a selective rather than on MacConkey's medium increases considerably the proportion of positive results in paratyphoid and food-poisoning infections but is not superior to direct plating on Wilson and Blair's medium in the case of typhoid fever. These enrichment media are most useful in the later stages of infection when the pathogens are less numerous and HYNES recommends tetrathionate broth as being the most generally useful. Both he and the Liverpool workers have shown that cases of paratyphoid may continue to excrete the pathogen for weeks after clinical recovery, and even in cases of food poisoning excretion of the salmonella may go on for several weeks. The selective media also bring to light symptomless contact carriers who, otherwise undetectable may be spreading infection to others. A point of importance in the examination of family groups for such cases is to ensure that the specimen is passed directly into a sterile container a wide-mouthed screw-capped grease-proof cardboard tumbler serves the purpose, or use may be made of rectal swabs which, if there is likely to be more than a few hours' delay in their examination should be dipped in saline-agar at the bottom of the container. As long as the specimen, whether fæces or rectal swab is not allowed to dry, typhoid and paratyphoid bacilli, and more surprisingly the Flexner and Sonne dysentery organisms, will remain alive at atmospheric temperatures (15° C) for several days at least.

The diagnosis of bacillary dysentery has always been handicapped by lack of laboratory confirmation in a fair proportion of clinical cases, and this handicap has lately been increased by the greater prevalence of mild atypical infections such as are associated with the Sonne bacillus. Although dysentery in civil practice is not, apart from the very young and the aged and infirm, a severe infection, its great infectivity creates serious administrative problems, particularly in children's hospitals mental hospitals and be able to add a chapter on the value of this part of their preparation for the campaign. In the meantime we should not lose sight of the fact that a man is likely to acquit himself well in an emergency if he is in good health and does not lack either food or sleep. "Give me health and a day," exclaimed **Emerson**, "and I will make the pomp of emperors ridiculous!"

---

[1] Scott W M *Lancet*, 1941 i 389
[2] Holt H D Vaughan A C T and Wright H D *Ibid* 1942 i, 133
[3] See Wilson W J *J Hyg Camb* 1938 38, 507
[4] Tabet F J *Path Bact.* 1938 46 181
[5] Hynes M *Ibid* April 1942 p 193
[6] Ruys, A C *Brit med J* 1940, i, 606

ADEQUATE ANTISYPHILITIC TREATMENT

The question what is an adequate course of treatment to prevent the sequelæ of syphilis has vexed clinicians for over four hundred years. There are many reasons for this. The disease, even if left untreated, has a natural tendency to clear up that may be disastrously deceptive. If inadequately treated it may lie dormant for years, breaking out eventually either mildly or severely in what **Jonathan Hutchinson** used to call "reminders." Signs and symptoms so mild as to pass almost unnoticed may end in a devastating paresis. Even with immediate and vigorous treatment there are still certain cases, luckily rare, which are completely resistant to every known form of therapy, dying within a year or two of the contagion in spite of every care. It seems, therefore, that in some instances we are dealing with seeds of greater or less virulence, and in others with soils that are less or more resistant to the spirochæte. Another handicap to adequate treatment is the poisonous nature of the various curative agents. Gone are the days of **Ulrich von Hutten** and his vaunted lignum vitæ, or China root and sarsaparilla. Even potassium iodide, popularised by **Wallace** in early Victorian days, and used so extensively by clinicians in the pre-arsphenamine era, has lost much of its former reputation. For only such heavy metals as produce protoplasmic poisoning are of recognised value today, and only certain of these metals are as yet clinically safe. Lead is still too dangerous. Antimony, after the unfortunate experiment of **Paracelsus**, was banned by the faculty and dropped out of active use for centuries, surviving historically only when associated with guaiacum in Plummer's pill; now that organic preparations are available, however, it may come into favour again. Silver produced argyrism, and even silver arsphenamine is suspect on that account. Gold, in addition to other contra-indications, is suspected of producing epilepsy if used in any lengthy treatment such as syphilis requires. Arsenic until **Ehrlich**'s time was much too poisonous. It therefore came about that mercury stood alone for centuries as the one and only curative agent. This was a great handicap, for the poisonous dose was so close to the curative that adequate treatment always was a major difficulty. Waves of enthusiasm for such adequate treatment periodically swept the profession, overdosage became common, and the results of treating the disease rather than the patient were so appalling that even the public got to know of them, and boxes of popular purgative pills had to be labelled "contains no mercury."

When the Wassermann reaction was discovered clinicians gave a sigh of relief. "Now we shall know when a cure is complete," they exclaimed. That hope too has faded. We do not know what a persistent positive Wassermann means. One school of thought believes it indicates that active syphilis is still present. This sounds a logical explanation and it may be true. But, after the discovery of the reaction, thousands of patients who had been treated in the old mercurial days rushed to have their bloods tested, and many of them proved positive though they had been free from any signs for thirty, forty and even fifty years. Clinically these people were cured, and giving them courses of arsenic subsequently, as conscientious physicians urged, made no difference. They still were Wassermann fast. Actually, as they had passed the dangerous quarter of a century after which late sequelæ practically do not arise, such treatment was unnecessary, the slow protoplasmic poisoning of two or three years of continual mercurial treatment having eradicated in their cases the danger of the spirochæte, if it had not actually destroyed it. Then came the arsphenamine era. A new technique was adopted, and the experience of centuries was forgotten. Therapia sterilisans magna! In the words of Dr **Schutzmacher** of The Doctor's Dilemma, "Cure guaranteed." It was a dream that those at the centre soon found *was* a dream, but its effects lasted through the war of 1914–18, and it was the huge aftermath of relapse cases in 1919–21 that drove the lesson home and restarted long and continuous treatment again. Happily bismuth was introduced about this time, and, being less toxic than mercury, gradually supplanted it as the protoplasmic poison necessary to keep up the knock-out effect of the arsenicals.

It is this aftermath of the inadequate treatment of the last war years that is now appearing. Statistics of these after-effects are now becoming available. The most recent are those of **Aggerbeck**[1] on the incidence of cardiovascular syphilis 20–25 years after the primary infection. Normally cardiac lesions show themselves 15–25 years after the primary stage. **Aggerbeck** reports on 220 patients infected 20–22 years ago, and finds that 19·6% on examination showed evidence of cardiovascular complications. He next reports on 550 cases of frank cardiovascular syphilis, and the previous treatment given. He found that 220 of these had had what was considered adequate treatment in the primary stages of the disease, but nevertheless had developed aortitis or other cardiac complications. This is a gloomier picture than we are accustomed to draw in this country, and reflects the results of the short courses of treatment formerly considered sufficient. We are no longer afraid to push arsenicals. The fear of peripheral neuritis and that late nerve lesions were likely to be increased by arsenical treatment has not been borne out. We have learnt that we cannot depend on the arsenicals alone to combat the disease. We require also long courses of the heavy metals, mercury or bismuth. The older drug owing to its toxicity has to be given with intervals between courses. Bismuth with its lower toxicity can in most cases be given continuously. The number of courses of arsenic depends mainly on the age, weight, sex and physical condition of the patient. Women seem to require a much smaller dosage than men of the same weight. Obviously a healthy young adult of twenty to twenty-five can stand more than a man of fifty to sixty. Three or four courses of half a gramme per stone is a fair average—that is, a ten stone man requires five grammes in each course. But one *should always* remember that it is the patient not the disease that is

---

[1] Aggerbeck, I *Nord Med* 1942 13 874

THE NATION'S TEETH

THE memo presented by the British Dental Associa-on[1] to the Interdepartmental Committee on Social surance and Allied Services deals not only with the roblem of dental benefit under the NHI Acts but with e whole question of the dental treatment of the dustrial population from the cradle to the grave he fundamental attitude of the association is that in e present generation at least no great results are to be xpected from attempts to prevent dental diseases, and hat regular examination and treatment at frequent tervals throughout life are essential to maintain easonable efficiency Grant this, and the inadequacy f present arrangements—antenatal preschool, school dolescent, and adult—must be admitted. The terrible ental condition of the average school entrant of 5 or years and the relapse common in adolescence when the hild even if made dentally fit at school, is no longer le to obtain treatment are mortifying facts, and the anner in which the dental benefit regulations have ndirectly encouraged the removal and replacement f teeth rather than their preservation is acknowledged. The association recommends a complete reconstruction f public dental service They ask for a much greater egree of central control for children s dental treatment nd extension of the service to include senior dental ppointments, provision for adolescents, and annual xamination and necessary care for all insured workers The substitution of statutory dental benefit for the present additional benefit (only available now to members f approved societies with a disposable surplus) is one f the principal recommendations Remuneration of the dental practitioner would be on a per-capita basis, and the scale of fees placing a disproportionally high value on extraction of teeth compared with their conservation would be abolished As complement to the rather distressing vista of unending dental treatment we may hope to learn of an equally studied campaign to apply such measures of prevention as we possess The national regulation of diet now in force offers opportunities impossible a few years ago. It has been maintained both in this country and the United States that only in conjunction with a determined and successful prophylactic campaign will adequate dental treatment for all become economically possible The programme which the association recommends in many ways the logical successor of the partial service now in force, is the more acceptable in that it seems to foreshadow, in the long run, a diminishing rather than a permanent charge on the national purse

PSYCHE AND SOMA

In a Swiss military hospital Dr R Brun[2] has investigated 259 patients in the neurological centre with a view to finding out how many showed psychoneurotic symptoms grafted on an organic illness He found such symptoms in 30–40% usually following either head injury or neuritis or neuralgia Of the 53 who had had head injuries 22 were neurotic—a proportion identical with that found among civilian head-injury cases before the war Brun takes this as confirming his opinion that neurosis develops after head injury in those with a neurotic predisposition It would have been valuable if he had given more details of the site and extent of the injuries in the neurotic and the non-neurotic groups and of the interval between the accident and the first appearance of neurotic symptoms—factors which may well have had as much bearing as predisposition A third of the 69 patients with neuritis or neuralgia showed psychological symptoms, but here again no details are given about the time of onset in relation to the basic illness Brun had reason to suspect that many similar cases were to be found in the rheumatic wards of the hospital but the problem of extracting neurotic patients from medical and surgical wards is unsolved in Switzerland as it is elsewhere He lays special emphasis on cases of anxiety neurosis with autonomic symptoms—vegetative neurosis, in the continental phrase—which he regards as true borderline cases between psychiatry and neurology. though he takes a purely neurological view of their origin insisting that psychogenesis and psychological complexes are absent in such cases, and differentiating them sharply from cases with a neurotic superstructure. His hypothesis of these psychosomatic disorders based on the speculations of Monakow, is one of increased excitability of the autonomic centres excessive endocrine secretion, and a breaking down of the barrier between blood and cerebrospinal fluid so that the brain is flooded with hormones having a toxic effect on cerebral function This excursion into theory is in contrast with the rest of his article, which keeps close to figures and facts He admits however that psychogenic processes may influence the autonomic mechanism, so that his dividing line is somewhat blurred

CHRONIC LUNG DISEASE IN CHILDREN

THE section of the Royal Society of Medicine for the study of disease in children held a joint meeting with the maternity and child-welfare group of the Society of Medical Officers of Health on May 22 to discuss the prevention of chronic lung disease in childhood Primary (allergic) asthma and tuberculosis were excluded from the discussion which dealt with the "catarrhal child —the one who gets recurrent and chronic respiratory tract infection—and that group of chronic lung disorders which goes by various titles (pulmonary fibrosis damaged lung, unresolved pneumonia) and often ends up in bronchiectasis The suggested causes of chronic lung infection and measures for their prevention more or less fell into two broad categories according to the occupation of the speaker The clinicians stressed the importance of collapse of the lung, the frequency of infection of the nasal sinuses and the abuse of sulphapyridine therapy The public-health workers dealt with more general measures and stressed in particular the prevention of primary pneumonia in the infant and the occurrence of lung complications in whooping-cough and measles Dr C E Field indicated quite clearly how often massive collapse precedes bronchiectasis, and both she and Dr Maurice Davidson pleaded for prompt use of the bronchoscope in all such cases to 'take the load off the cilia" in the striking phrase used many years ago by Chevalier Jackson Several speakers thought that collapse may be encouraged by the use of atropine and belladonna during acute disease of the lungs these drugs tending to favour the production of thick mucus plugs Plenty of fluid and possibly drugs such as iodides to encourage bronchial secretion were better lines of treatment All were agreed that pulmonary collapse is common, that it is often missed or mistaken for tuberculosis and that active measures to deal with it are essential As regards sinus infection several speakers testified to its frequency and the public-health workers were asked if their organisation is capable of doing more for the diseased upper respiratary tract in children than mere removal of tonsils and adenoids. The abuse of sulphapyridine was approached from several angles Has the use of the drug tended to increase chronic lung conditions? If properly used probably not, but it was stressed that under-dosage is far too frequent and if the drug is to be used at all it must be given in adequate amount From the public-health angle Dr Norah Wattie spoke of what is being attempted in Glasgow to prevent chronic lung infection For the prevention of acute pneumonia she looked to education of the public on the dangers of droplet infection poor-law institutions Any method for the better detection of atypical cases and symptomless carriers is therefore welcome Utilising the discovery of LEIFSON[7] that sodium desoxycholate in the presence of sodium citrate inhibited the growth of *Bact coli* without much effect on the intestinal pathogens, HYNES prepared a desoxycholate-citrate medium based on the formula of the Difco SS agar, and tested it for the isolation of the causative organism in Flexner and Sonne dysentery infections His results showed that the new medium was greatly superior to MacConkey's, and this opinion is supported by the findings of POT, *reported on another page*, using the Difco medium itself HYNES'S also revealed a high incidence of convalescent carriers, and this confirmation of a suspicion entertained by clinicians from the occurrence of return cases should help to prevent the premature discharge from hospital of convalescent dysentery carriers who might otherwise spread infection The value of this new medium has *corroborated by workers*[8] *in the Emergency* Health Laboratory Service, one of whom rem that the desoxycholate-citrate agar may well pro to be as indispensable in the bacteriological diagno of dysentery as the tellurite medium is in that diphtheria The medium has the further advanta that it can be used for the isolation of the salmonell group, where HYNES has found it equal—or nea so—to Wilson and Blair's medium for paratyph and food-poisoning infections though less useful in typhoid fever *Another feature of his medium is* that it inhibits the growth of rough Sonne strains and possibly rough variants of other bacteria, and is thus proving of value to those concerned with the maintenance of smooth strains for the preparation of vaccines and antisera

---

[1] From the dental secretary of the BDA at 13 Hill Street London, W 1

[2] *Schweiz med Wschr* 1941 71 1597

---

[7] Leifson, E *J Path Bact* 1935, 40, 581

[8] *Mon Bull emerg publ Hlth Lab Serv* May, 1942, p 6

Annotations

SULPHAMETHAZINE

SINCE the introduction of the sulphonamides into clinical medicine six years ago, a succession of new preparations has appeared, each claiming advantages over its predecessors When sulphanilamide was shown to be the active radicle of prontosil, various chemical linkages with it were prepared and those with a heterocyclic ring attached to the parent substance were found to be therapeutically most effective—e g , sulphapyridine, sulphathiazole and sulphadiazine The chief advantages of these heterocyclic compounds is their *curative action against bacterial infections insusceptible* to sulphanilamide, such as pneumococcal, staphylococcal, Welch and Friedländer bacillus infections The present import difficulties have largely limited experience with these new drugs in this country to sulphapyridine, which, while an excellent curative drug, produces gastric upset in a considerable proportion of cases, and, perhaps because of its poor solubility, is apt to produce renal damage and obstruction from deposition of crystals in the urinary tract Sulphanilamide is therefore still the drug of choice in streptococcal and coliforn infections, and is also curative in a high proportion of meningococcal and gonococcal infections, while sulphapyridine should be used for pneumococcal infections, gas gangrene and the more fulminating infections or those of unknown bacterial ætiology *It must again be emphasised that adequate* dosage—an initial dose of 2–3 g followed by 1 g four-hourly until the temperature settles and smaller doses for a further three or four days—is essential for the cure of all the more severe bacterial infections, with the possible exception of coliform pyelitis and cystitis where a maximum of 3–4 g daily should suffice In most cases medication by mouth is effective but in severely ill and comatose patients, or where absorption from the gut is likely to be poor, intravenous therapy is needed to establish an adequate blood-level of the drug as early as possible, and this may mean the difference between life and death The soluble sodium sulphapyridine has been found most useful in such cases , it can also be given intramuscularly, rectally or, in less severe cases which do not quickly respond to oral administration of the ordinary drug, by mouth

The disadvantages of sulphapyridine seem largely to have been overcome in America by the introduction of sulphadiazine, which besides being effective against a wide range of bacterial infections and remarkably free of toxic effects is also well, though not quickly,[1] absorbed and is retained longer in the tissues so that less frequent dosage maintains an adequate blood level of the drug However, the high cost of the drug and its poor solubility with consequent risk of renal damage debars it from being heralded as the ideal sulphonamide for general use in this country Now the research laboratories of Imperial Chemical (Pharmaceuticals) Ltd has prepared a near relative of sulphadiazine which they term sulphamethazine and which, besides being a home product, has the advantage over sulphadiazine of being highly soluble so that a concentrated preparation *(1 g in 3 c cm of fluid) can be given intravenously* where required, while the risk of renal damage from insoluble crystals is probably obviated A group of workers in Manchester have tested this new drug on a series of 73 patients with lobar pneumonia *and in a few* cases of meningococcal meningitis and acute gonorrhœa , their findings appeared in these columns last week (p 639) In their patients with pneumonia they used an initial dose of 4 g followed by 2 g every six hours, which, while clinically effective, gave very irregular blood-concentrations, varying from 2 to 13 5 mg per 100 c cm This irregularity in absorption and in the amount of drug acetylated is found with other sulphonamides, including sulphadiazine, and seems to some extent to depend on the patient rather than on the drug or the disease Estimation of the blood level is not required as a routine—Flippin and his colleagues,[2] working with sulphapyridine and sulphathiazole, found that the therapeutic response in pneumonia was as *good with a blood level of 2 mg* as with 15 mg per 100 c cm —but in any patient not responding within two days to treatment the blood-concentration of the drug should be determined, and if it is below 3–4 mg *dosage should be increased or several doses* of the drug given intravenously In the Manchester series of pneumonia cases clinical improvement was usually noticed within 24 hours, and a fatality of 6 8% was almost identical with that of *an earlier and larger series* treated with sulphapyridine Toxic effects were very few , only 5 of the 73 patients had transient nausea and vomiting , 1 had late jaundice, 2 had rashes and 1 gonorrhœal case had drug fever There were no renal complications although urines were repeatedly examined for crystals, but, oddly enough, renal complications do not seem to be common in cases of pneumonia treated with other sulphonamides *The rapid response to* intravenous therapy in 2 comatose cases of meningococcal meningitis indicates the value of this form of medication in severely ill patients It is to be hoped that supplies of this new drug *will soon be available* at a reasonable cost

---

[1] Long, P H , Bliss, E A and Ott, E *Bull Johns Hopk Hosp* 1941, 69, 297

[2] Flippin H F Reinhold, T G and Schwartz, L *J Amer, med. Ass* 1941, 116, 883

Special Articles

PNEUMOKONIOSIS OF COAL WORKERS

THE late W C Rivers in an unforgettable essay entitled Smudged Country has described how the coalfields of this country exist side by side with the farmstead and the ploughland which they have never entirely obliterated from Lanark to the Rhondda The Medical Research Council's report[1] on chronic pulmonary disease in South Wales coalminers draws a similar picture of a smudged record The collier's lung, write the authors of the pathological section, is like a parchment which has been twice written upon · the original legend is in the form of dust-reticulation and is inscribed over the whole fabric ; the later legend is in a different tongue written in coarser characters and by a heavier hand, the hieroglyphics of silica and the tubercle bacillus The deciphering of this palimpsest (Cummins's elegant term) has been the task of the team of investigators engaged upon the research As it proceeded the evidence accumulated that there existed among the coalminers of South Wales a disabling form of chronic pulmonary disease which did not come within the accepted definition of silicosis and did not qualify for compensation.

The investigation really began with the Workmen s Compensation (Silicosis) Acts In 1934 the Silicosis Scheme was extended to include workers engaged in " any operation underground in any coal mine ' Thereafter the statistics showed the striking fact that there existed a type of disabling pulmonary disease apparently due to employment which did not come within the definition of silicosis The clinical and radiological survey is prefaced by a short but comprehensive description of the South Wales coalfield by Mr Donald Hicks Various grades of miners, comprising 2000 in all, were examined in 16 collieries of the coalfield · in 8 of them the coal mined was anthracite and in 8 non-anthracite , in 5 of the latter it was steam and in 3 bituminous Nearly 500 coal-trimmers from 4 coal exporting ports were also examined It was not found that any particular physical signs could be relied upon as indicating the presence of X-ray abnormalities directly attributable to dust, though the signs were often of value in the detection of associated emphysema or tuberculosis During its chronic ambulatory stage the pneumokoniosis did not produce a raised blood-pressure Of 80 sputa examined from men in one colliery, all were negative for tubercle bacilli The incidence of tuberculin sensitivity appeared to be as high as in the general adult population A reduction both in average total lung volume and in average volume determination was not regarded as likely to be of much value in the individual case.

The X-ray abnormalities attributable to dust are classified as (*a*) normal, (*b*) reticulation (*c*) nodulation, (*d*) coalescent nodulation, (*e*) massive shadows, (*f*) multiple fluffy shadows and (*g*) and (*h*) indefinite Form rather than degree of change was the determinant, and the terms reticulation, nodulation and consolidation are used descriptively, although it was found that they could be correlated with a fairly well-defined pathology The classification is not necessarily applicable to other workers outside the coal industry, and even within the industry it applies mainly to workers in contact with coal and the coal face and less properly to men who are primarily rock workers and whose X-ray shadows approach the types characteristic of classical silicosis The picture of reticulation—a fine net-like shadow—is regarded as being of great significance, and meriting a series of illustrative radiograms in photogravure This type of X-ray appearance has not been seen in South Wales colliery workers unexposed to colliery dust, and if it does occur at all in the general male population of the area its frequency does not approach that among miners Well marked reticulation in a South Wales coalminer may, in fact, be accepted with a very high degree of probability as due to his dusty occupation, and colliers who develop nodulation and the other changes comprising consolidation have all passed through this phase of reticulation. It is not infrequently associated with some degree of respiratory disability, mainly in the second half of life

The pathological report is based upon the examination of tissues from 42 autopsies regarded as the most suitable for correlating clinical and pathological findings The coalminer's lung is a mixed type of pneumokoniosis due partly to silica partly to coal dust and in some cases partly to infective processes In it are recognised at least three more or less distinct types of dust lesion. nodulation, confluent fibrosis and simple anthracosis, or as the writers prefer to call it dust reticulation Nodulation and confluent fibrosis are already well recognised and the report is concerned chiefly with dust reticulation, which it was necessary to correlate with the radiological picture The dust deposits are scattered in a lace-like pattern of fine streaky appearance throughout both lungs The change is diffuse and symmetrical, affecting all parts of the lung more or less uniformly with the exception of the extreme bases, and the distribution is essentially that of the lymphatic pathways and depots The root glands are packed with dust ; there is a heavy storage of it along the interstitial tracts, in the perivascular and peribronchial sheaths, as well as in the interlobular septa and subpleural tissues of the lung Tuberculosis was noted in a small number of cases, and for this special dust-plus-tubercle effect the term " koniophthisis ' is suggested Emphysema was present in all cases Analysis of the dust particles showed that in addition to carbon particles, there was a siliceous dust which was largely a mixture of silicates with some lesser amounts of quartz

Dust reticulation is regarded as a response to excessive quantities of inhaled dust a foreign-body reaction of the simplest type arising from the lung s inability to rid itself of inhaled particles Dust cells or macrophages which are termed koniophages, either pass back into the bronchi and are ejected in sputum or enter the pulmonary lymphatics and are carried off to the hilum glands. The deciding factors are thought to be the motility of the koniophage and the quality of its dust load : some dusts stimulate phagocytosis, others depress it ; coal belongs to the former group, silica to the latter. The more active koniophages tend to move outwards towards the bronchi, the sluggish towards the lymphatic channels Coal dust alone does not stimulate the production of much reticulum Quartz certainly does and some of the silicates also It is concluded, therefore, that the reticulation of colliers is due more to the action of silica than coal The mechanism of production is twofold : (1) The relative immobilisation of dust cells so that they do not escape but tend to accumulate in the lung · (2) the elaboration of reticulum fibres In the collier's lung silicotic fibrosis is always preceded by dust reticulation The progression from one to the other is however sporadic, and a hypothetical factor " X " is suggested which alters the silica, perhaps by dissolving it, into a substance capable of producing redundant collagenous fibrosis, whilst the unaltered silica remains capable only of producing reticulation.

The MRC committee recommends the use of the comprehensive term " pneumokoniosis of coal workers ' for all pulmonary conditions due to dust, in workers engaged in any operation underground in coalmines, in screens workers at collieries, and in coal trimmers at docks For purposes of compensation the required X-ray standard should include reticulation as well as the already accepted nodulation and consolidation From the medical point of view there is much to be said for the initial and periodical examination of all coalminers in South Wales.

MEDICINE AND THE LAW

Unqualified Practitioner's Modest Description

DOES an unqualified man's description of himself as a " specialist in incurable diseases " bring him within section 40 of the Medical Act ? It seems odd that Parliament should allow such a fraud to be perpetrated upon the public when the advertisement of remedies for cancer, diabetes, epilepsy, paralysis and tuberculosis has been made a criminal offence The question did not need to be answered in a recent prosecution quoting her recent work which indicates that the type of pneumococcus present in pneumonia affecting infants under one year are those normally found in the upper respiratory tract Housing and nutrition are also important aspects of the problem She also stressed the need for special convalescence of young children recovering from pneumonia Such children should be moved from acute wards after two to three weeks and treated on sanatorium lines with skilled nursing Dr V. Saunders-Jacobs also emphasised the value of convalescence for the catarrhal child and she indicated the magnitude of the problem by saying that examination of 9777 toddlers had revealed bronchitis in 2918 The prevention, postponement or modification of measles and whooping cough was discussed by several speakers Dr A Sigmy spoke of this as a "sad story," for scientific research made measures available as far back as 1929 but little official encouragement has been received Dr. Wattie told how placental globulin has been successfully used in institutions in Glasgow to produce attenuated attacks of measles and Dr Saunders Jacobs stressed the importance of getting the measles child to bed before the rash appears As regards whooping-cough the modern vaccines in adequate dosage seemed definitely of value Dr Wattie explained that combined vaccination with pertussis vaccine and diphtheria prophylactic is insisted on as a condition of admission to war-time nurseries in Glasgow The practical difficulty with regard to more widespread use of pertussis vaccine appears to be that mortality and lung complications are highest in the infant and, to affect these vaccines must be given probably at three months of age The anti-diphtheria campaign has got the idea of prophylaxis at one year into the minds of mothers and the change to an earlier age, with more chance of some reaction in the infant, may be difficult Speakers from both the clinical and the public health standpoint urged the need for closer cooperation between the pædiatrician and the welfare clinic medical officer to secure adequate investigation of the child with chronic lung disease in its early phases Tuberculin patch test, radiological examination, iodised oil and bronchoscopy were said by Dr Alan Moncrieff in his opening remarks to be an essential programme in all children with persistent pulmonary disease Too much reliance on relatively passive measures—fresh air, rest, improved nutrition—often means valuable time lost and permanent lung disease, curable only by radical surgery, is the tragic result

---

[1] Chronic Pulmonary Disease in South Wales Coalminers I Medical Studies (1942) Medical Research Council Special Report Series No 243 Pp 222 10s 6d (A) Report by the committee on industrial pulmonary disease (chairman C G Douglas F R S) (B) Medical survey by P D Arcy Hart and E A Aslett (C) Pathological report by T H Belt and A A Ferris

DISEASE IN CATTLE

THE loss of milk from four common diseases of dairy cattle—mastitis, contagious abortion, sterility and Johne's disease—has been assessed by the National Veterinary Medical Association at about 200 million gallons a year in this country alone, the equivalent of £15 million The average milking life of a cow is only half what it might be, and 58% of cows passing out of herds are disposed of on account of disease A survey committee[1] of the association has emphasised that preventive veterinary medicine should include testing for and immunisation against disease when possible, and advice on feeding and nutrition which would help to build up resistant stock The committee are primarily interested in improving animal health, but naturally any increase in quality and quantity of dairy products must have a bearing on human well-being, especially now when we cannot afford to maintain animals of low production who are a menace to healthy stock A scheme for the control of disease in cattle has been under consideration by the association for nearly two years and has been discussed with representatives of the Ministry of Agriculture (animal health division), the National Farmers Union and the Agricultural Research Council All seem willing to coöperate, and a voluntary scheme,[2] based on a contract between the veterinary practitio and the farmer, came into action on June 1 It is short-term policy designed to meet the imm demand for milk production, but a long term policy being devised too and will be kept in mind To red streptococcal mastitis, the association advise rout quarterly examinations of all dairy cows by a veterinari treatment with sulphonamides, and irrigation of udder, work in progress indicates that the appropri specific toxoid may be useful in mastitis caused by t *Corynebacterium pyogenes* or by a staphylococc Contagious abortion is likely to be reduced, as we no recently,[3] by the use of the live vaccine sanctioned b the Ministry of Agriculture The committee recommen that facilities for blood testing of cattle should be maintained and extended, that living vaccines should be given to non-pregnant cows and to young heifers between the ages of 4 and 8 months, and that these heifers should be kept apart from the main herd until they calve An extensive field trial should be made with the vaccine on herds kept under controlled conditions Stock owners should keep records of sterility in their cattle and the veterinarian should examine breeding animals periodically and advise on treatment Herds should be tested with johnin for Johne's disease, and positively reacting cattle should be segregated, those clinically infected should be slaughtered, and young stock should be reared apart from adult cattle, and use separate pastures, contaminated pastures should not be grazed for 12 months

The Ministry is coöperating in the new scheme by providing laboratory services and contagious abortion vaccine free, and sulphonamides at a much reduced charge Bovine tuberculosis is not covered by the scheme because it is already being dealt with officially The long-term policy of the committee aims at disseminating veterinary knowledge, and applying it as part of a continuous agricultural plan

MEMO ON BURNS

THE committee on burns appointed by the Department of Health for Scotland, with Sir John Fraser as chairman, has followed its memo of last year on first aid treatment of burns with one on their treatment in hospital[4] In his foreword Professor Fraser remarks that the natural desire to explore alternative methods of treating burns, though admirable, has led to confusion, and the present memo is intended to help the general reader in the choice of treatment by presenting him with a "community" opinion reached by a group who include bacteriologists and a pharmacologist as well as plastic and general surgeons Much of the text has been drafted by Prof W C Wilson, and the memo has been edited by Mr A W Wilkinson F R C S After comparing the classifications employed, ranging from Dupuytren's six degrees to the Scottish two—superficial and deep—the memo gives a detailed account of the local and general pathology of burns and of their clinical course The main part of the memo, on treatment, has a section on burns in special situations, Dr A H H Sinclair writing on burns of the eyes The memo ends with appendices of prescriptions and dosage, and designs for hand baths, an improvised heated tent for use where a "shock room" is not available, and a bacterial filter for the hair dryer used in coagulation treatment

Sir HENRY DALE, president of the Royal Society, will retire from the post of director of the National Institute for Medical Research on Sept 30 To succeed him the Medical Research Council have appointed Prof C R Harington, F R S, who is at present professor of chemical pathology in the University of London and director of the Graham Medical Research Laboratories in University College Hospital medical school entioned at the end of the visit that her servant was ing of smallpox Mary Evelyn caught the disease and proved fatal Of Lord Falkland, Evelyn very nearly—it not quite—says "serves him right"! But the most nvincing evidence of the widespread incidence of the sease is seen in an account of his visit to Mrs Graham her eldest son was now sick of the smallpox, but in a kely way to recover, and other of her children run about d among the infected, which she said she let them do purpose that they might, whilst young, pass that fatal isease, which she fancied they were to undergo one time other and that this would be for the best, the verity of this cruel disease so lately in my poor family onfirming much of what she affirmed"

---

[1] *Vet Rec* 1942, 53, 3

[2] *Ibid*, 1942, 54, 193

[3] See *Lancet* 1942, i 622

[4] Hospital Treatment of Burns EMS Memo No 8 Edinburgh H M Stationery Office Pp 39 9d

* * *

The art of hitch-hiking, which bloomed so swiftly this country, is now fast withering for lack of petrol its heyday it was, for the hiker, an amusing as well a useful way of getting about, for the driver it was n enthralling puzzle "Does he want a lift or is he (*a*) oing to cross the road, (*b*) waiting for a friend, (*c*) admir g the scenery, or (*d*) about to blow his nose? Is she (*a*) opping along to have a chat with a neighbour, (*b*) ondering what to give her husband for dinner, (*c*) aving to the baby, or (*d*) remembering what her other told her about accepting lifts from strangers?" choolgirls can be particularly haughty on the last ount, remarking "No thank you" more snubbingly han any duchess Signals are rare and equivocal, o the driver thinks, the pedestrian feels he has been aving an eloquent thumb for hours What we really eed is a Highway Code for Hikers To mislead a enevolent but busy driver into pulling up spoils the icket for other hikers "Arch your thumbs and give he driver a winning smile," said the sergeant in *Punch*— piece of advice which if followed by all would maintain he industry to the last drop of petrol The hiker, once itched, has another cross to bear he can't read lmost all drivers want to talk, and the few that don't sually have a wife with them whose loquacity explains heir silence There is always danger, too from the g hearted driver who is only going a mile in your irection but would love to take you that far, and there s plenty of room in the back There isn't, but you an't bear to disappoint him and you climb gingerly in, nly to find before you have settled that he is pulling p with the cheery assurance that this is as far as he oes but there will be plenty of cars along presently ittle does he realise that he has parked you on a dead traight bit of road where the cars fly past, and that if ou are to get a lift at all you must trudge back to the trategic corner from which he snatched you up

* * *

We landed on the island, pink with thrift—that's to say the island was—and cruel brutes in evening dress, murderers of the weak, mocked our coming In other words we landed on Annet, Scillonian bastion of the Atlantic, and the greater black-backed gulls withdrew to the rocks and jeered at us, while we examined the carcases of their victims, the Manx shearwaters The thrift here makes a deep soft peat in which the shearwaters—and puffins and rabbits too—find it easy to burrow, and although we didn't see a living shearwater we knew there were hundreds of hens sitting under us, brooding their single eggs The males are far out to sea and will come to feed them with strange ritualistic cries at dusk It's then and at dawn that the gulls do vile murder

This is an island of contrasts, of utter peace and continual warfare, of dark, subterranean domesticity and death on the surface, a lyrical island amid warring seas Our hearts bled for the hundreds of these petrels that had perished and we made lamentation for them O lovely Oceanic, whose swift wing, white as the wave's crest, black as the windward trough, darts tilted o'er the vastness of the sea, untiring in your dive and bank and swerve, more free than *man can ever guess, yet this, this fly-*blown foulness, is your lot when you come back to breed All the same, the species is said to be on the increase

The Isles of Scilly are particularly interesting nowadays The prosperity of a gold rush has descended on them, fortunes from flowers which have few competitors At the beginning of the harvest in mid-winter, they fetched almost their weight in silver, now at the end of it when the "double whites" and even some of the wild gladioli or "jacks" are being marketed, the prices are still good The flower season overlaps with the early potatoes of which they are growing an increasing amount, but on the whole their soil is poor, their one asset being their earliness and their climatic ability to grow the more delicate kinds of bulbs Those who gibe at flower-growing in war-time should remember there are other gleams of light in the blackness of total war—horse racing, hunting, cinemas Personally I prefer the kindly light of flowers which can penetrate where the others don't—in the home One quite small farmer last year told me he had banked £6000 that season, this season has been even better, but they are not talking about it, taciturn, defensive They pay no income-tax, they pay nothing in direct taxation for the soldiers, sailors and airmen who defend them A number of their young men are at sea, but the correspondent in the *Times* who stated the other day that their old men were risking their lives catching fish was talking nonsense I read it to some of them "That must be you and your ole crab-pots, Jarge," they jeered There are richer pots on land They've got one of the loveliest little hospitals in the world If I had to be ill I can think of nowhere where I should prefer to be Their school is on an ideal site, but oh so badly needs altering! The three younger classes are housed in rooms whose only windows are up by the ceiling My guess is that physically the islanders fall below mainland standards and that one of the reasons for this is that in ordinary times they feed too much out of tins Allergic disease seems rather common, yet allergics from the mainland often get better here The prevailing wind off the Atlantic must be dust free, perhaps that accounts for both these observations These two hundred odd islands and rocks, only five of which are inhabited by man, are a naturalist's paradise seals, sharks, shore-life, subtropical plants and trees a wealth of birds, some fascinating insects One scarlet-letter day in 1924 I saw seven crimson-spotted footmen, surely an entomological record for Britain Please God this paradise will not be spoilt by Mammon

* * *

We called her Penelope because we could never quite be certain of her surname She was a grey-haired Cypriot who was sent to our base hospital with a mild attack of fibrositis After recovery she elected to stay on as a resident wardmaid and week after week she continues her monotonous cleaning with a charming smile and no improvement whatever in her English One day last summer she smiled at the almoner as usual and then with a mysterious air made the declaration "Police, Register, Please" several times We had had all this before Penelope can never quite appreciate that she is a British citizen and therefore exempt from certain restrictions in this neighbourhood, so the almoner shook her head and said "No, No" as she had said many times before in a similar conversation But Penelope was not satisfied She repeated her incantation and added surprisingly "Johnny—Egg" Then beckoning the almoner she led the way out of the ward, down past the hut where her cubicle lay to the edge of the medical superintendent's garden There, tethered by one leg to the fence by an unmistakable bandage, was Johnny—a nice, fat hen Our intelligent almoner grasped the situation at once Penelope obviously was inquiring how and where she should register her poultry for food But any explanation of this was difficult and so was the attempt to put across the fact that wardmaids did not usually keep hens However Penelope was undaunted She took the subsequent visits of the ward sister and the sister-housekeeper as compliments and showed them the sleeping quarters—two fire-guards from a reserve ward with straw that came with a lease-and-lend package It was impossible to damp her enthusiasm and the attempt was abandoned pending the weekly visit of Penelope's daughter, a sophisticated young woman who spoke excellent English Meanwhile *it was obvious that food* for "Johnny" was being "borrowed" from the ward and there were strong suspicions that egg-laying (if any) took place in Penelope's cubicle The end came sooner than the daughter Johnny bit through his bandage and feasted on the medical superintendent's spring greens and young peas This was too much a neck was wrung and Penelope accepted it with her usual smiling philosophy We hadn't the heart to press for a solution of the intriguing problem—why "Johnny"?

because the defendant's full description "M D, B Sc, Pathologist, Specialist in Incurable Diseases" was plainly comprehensive enough to justify conviction

Charles Bernard Clark, the defendant, who had exhibited these words at 46, Queen Alexandra Road West, South Shields, pleaded guilty to two summonses charging him with having unlawfully, wilfully and falsely used the title of "Doctor of Medicine" and the description already mentioned, thereby implying that he was registered under the Medical Act The prosecution stated that a lady fell and broke her arm outside Clark's house last February Seeing his plate, and believing him to be a doctor, her husband took her inside for professional attention Clark treated her and accompanied her to her home The patient and her husband continued to think he was a doctor until he began to abuse medical practitioners and hospitals Next day they consulted their own medical attendant and told Clark that his services would not be further required Clark sent in an account for four guineas, when the husband protested, he was told that there would be a similar charge if a specialist were called in Clark's solicitor addressed the court in mitigation of sentence The accused, he said, was a native of Jamaica, aged 33, educated at the Cornwall College, Jamaica, where he obtained the degree of B Sc He had been in England for 7 years and was lately a private in the RAMC where he apparently acquired some medical knowledge before being discharged on grounds of ill health He had applied to the Central Medical Committee and having received the committee's reply he mistakenly thought he could use the word "pathologist" without being registered under the act He had worked as a masseur and had attended cases of broken limbs He had not signed any death or other certificates and none of his patients had died The solicitor expressed Clark's regrets and gave his undertaking that he would not use these titles again

It was perhaps surprising that the accused should have been in any uncertainty about his position as an unqualified practitioner inasmuch as a Liverpool detective constable had previously given evidence identifying him as the man named Clark who was sentenced at Liverpool sessions in May, 1937, to 3 years' imprisonment on a charge of false pretences in acting as a doctor On the other hand there was certainly no evidence that any of his patients had suffered from his treatment On his plea of guilty to the two summonses the prosecution withdrew a third summons relating to his use of the description "pathologist" The magistrates imposed a fine of £15 on each of the two charges, and ordered Clark to pay 8 guineas legal costs and the expense of bringing the police officer from Liverpool to prove a previous conviction which was said to have been denied The proceedings were instituted by the London and Counties Medical Protection Society on information furnished by a member Thus the public is protected as well as the medical profession

---

MEDICAL INSURANCE AGENCY —At the annual general meeting held on May 18, with Sir Humphry Rolleston in the chair, the audited accounts were received and adopted Covenants entered into with the Royal Medical Benevolent Fund and the Royal Medical Foundation of Epsom College (as modified by the Finance Act 1941) will result in a receipt by the charities of a total sum of about £3450 The remainder of the available profit was placed to reserve for taxation The total saved to the profession in rebates of premium is, as usual, much larger than the above sum The chairman's report summarised the year's experience New life business in 1941 was less than the previous year at £434,815 (including £103,736 from the Scottish Office) against £500,764 for 1940 New sickness and accident policies represented a weekly benefit of 307 guineas In motor car insurance 356 new policies were arranged A considerable volume of war damage insurance was effected, and assistance rendered in difficulties over claims to some doctors who had arranged their policies elsewhere Owing to restriction of circularisation, the agency has now to rely mainly on its established reputation for future inquiry The retiring members of the committee were re elected—viz, Sir Humphry Rolleston (chairman), Mr N Bishop Harman, Sir Ewen Maclean, Prof F R Fraser, Sir Robert Hutchison, and Mr Henry Souttar

---

In England Now

A Running Commentary by Peripatetic Correspon

LAST Wednesday I went to get my new ration I live in a dim part of a large city so that my pilgr meant two hours in a queue which I joined in playground of a nearby elementary school Opport for observation, contemplation and reflection nowadays the exception rather than the rule I tried turn my chance to account Two chief imp remain—the dirt and the good humour Barely h joined the queue when I felt something crawling in retro-nuchal region Hand travelled up to neck by a stroke of good fortune was rewarded by getting firm grasp betwixt thumb and forefinger of a f blooded specimen of *Pulex irritans* This inauspiciou start hardly augured well for the rest of my vigil but had now become fully alive to social problems Ev allowing for bad housing, shortage of fuel, ineffecti water-supply, overcrowding, smoke nuisance an poverty, nothing will now persuade me that much what I saw was not due to plain human dirtiness As profession, individually, scientifically and as heal officers we have fought manfully for cleanliness B have we waged total, aggressive and shooting wa against dirt, stigmatised as dirt? Instead of advertise ments featuring the prospective swain coolly weighin his darling's alimentary, respiratory or perspirator features, could we not depict him in contemplation o her coiffure with the caption "Tres charmante, tr chic, but I wonder "? And as for the goo humour, none of your post-office atmosphere here The presiding goddesses at their desks were not merely trying to be civil they radiated good temper Even the girl in the sailor collar (ahead of me, alas), who presented no fewer than sixty ration books, evoked but the mildest comment From the waiting multitude broke peal on peal of laughter as they surveyed the antics of their preschool progeny rolling happily on the filthy floor of the schoolroom, twitted the elderly lady with the game leg who had had the temerity to appropriate a chair, or remonstrated with the inebriated Irishwoman who, as the hour advanced, demanded a place at the head of the queue on the pretext that himself would be waiting for his tea

* * *

I have lately been reading the diary of that highly intelligent and very lovable man, John Evelyn, and have been much struck by the havoc wrought in the 17th century by smallpox, the ravages of which are referred to again and again Among the more important deaths mentioned are those of Queen Mary (how strange that looks in print, I suppose because we nearly always see her name in its hyphenated form, William-and Mary) and of the Duke of Gloucester, the young son of Princess, later Queen, Anne Dr Tenison made one of the rare recoveries to become subsequently Archbishop of Canterbury Evelyn himself suffered as a young man Travelling home from Italy, where he spent some years owing to his dislike of the Cromwellian era, he describes how he reached his inn in the Savoy "being extremely weary and complaining of my head and finding little accommodation in the house, I caused one of the hostess's daughters to be removed out of her bed and went immediately into it whilst it was yet warm, being so heavy with pain and drowsiness that I would not stay to have the sheets changed, but I shortly paid for my impatience, falling sick with smallpox as soon as I came to Geneva, for by the smell of the frankincense and the tale the good woman told me of her daughter having had an ague, I afterwards concluded that she had been newly recovered of the smallpox" He recovered, thanks to his nurse, "a vigilant Swiss woman, whose monstrous throat, when I sometimes awaked out of unquiet slumbers, would affright me" So big, by the way, were some of the goitres in Switzerland then that he says many women had to support them by tying linen cloths over the top of the head Smallpox took a heavy toll of Evelyn's own family, for he lost two daughters, a son, a cousin and a grandson from it One of the very few occasions when he shows just a spice of malice in his equable temperament was when he records the death from smallpox of Lord Falkland, because it was when she was staying with Lady Falkland nine years before that his much loved daughter Mary was taken to call on a lady who casually seldom intervened in public discussions but when he his soundness of judgment, based on a wide know- ge of his subject and a full endowment of common se, carried great weight A particularly valuable k for tuberculosis was the organisation of study rs abroad and courses of postgraduate study at home s he carried out with conspicuous success for many rs and at the cost of an immense amount of work, which his devoted wife helped

DR RUSSELL ANDREWS

rof Fletcher Shaw, P R C O G, writes In your notice Russell Andrews little was said of his work for the ndation of the Royal College of Obstetricians and æcologists, which in all probability will do more to serve his memory than any of his other activities committee first formed to report upon the practic- lity of the proposals, and if found practicable to make crete plans for the foundation of this college, con- ed of Blair Bell, Comyns Berkeley, Maclean and myself, we had not progressed far before we coopted Russell drews To this body he was a tower of strength sane common sense realised how far we could go with easonable chance of success, while it poured cold water unpracticable idealisms On the other hand his strength character opposed the acceptance of compromises less an the attainable simply because such a compromise uld make our progress more easy This work took veral years We met much opposition and many ficulties, and not infrequently seemed to have reached impasse. It was then that Andrews's cheery optimism me into full play Just as he refused to waste energy er unattainable ideals so he refused to be despondent set-backs and was always ready to take up the rden and to try another road where one was blocked ter the foundation of the college Andrews served on e first council and as chairman of the examination mmittee saw many changes made with the object moulding a crude machine to our ideals Never fled by criticism, never goaded into making a hasty mark which would rankle, he remained on the best of rms with his committee and generally ended by guiding em along the path he thought best, though he always stened carefully to opposed views and was open to nviction I owe the college a debt of gratitude for inging me the friendship of Russell Andrews Fond an outdoor life and sports, he brought a breath of clean untry air into any company, while his hatred of malice nd loyalty to friends will long preserve him as a precious emory

---

NFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED MAY 16

Notifications —The following cases of infectious disease ere notified during the week smallpox, 0, scarlet ver, 1103, whooping-cough, 1417, diphtheria, 636, aratyphoid, 14, typhoid, 9, measles (excluding ubella), 5611, pneumonia (primary or influenzal), 1094, uerperal pyrexia, 150, cerebrospinal fever, 178, polio- yelitis, 11, polio-encephalitis, 3, dysentery, 85, elapsing fever, 1, ophthalmia neonatorum, 77 No case of holera, plague or typhus fever was notified during the week

The number of civilian and service sick in the Infectious Hospitals the London County Council on May 13 was 1534, including arlet fever, 172, diphtheria, 149, measles, 217, whooping ough, 453 enteritis 56, chicken pox, 51, erysipelas, 30 umps 61, dysentery, 28 cerebrospinal fever, 27, puerperal epsis, 20, enteric fevers 7, german measles 7, encephalitis thargica, 1 glandular fever 1, other diseases (non infectious), 49, not yet diagnosed, 105

Deaths —In 126 great towns there were 1 (0) deaths rom an enteric fever, 2 (0) from scarlet fever, 1 (0) from easles, 8 (0) from whooping-cough, 11 (0) from diph- heria, 50 (8) from diarrhœa and enteritis under 2 years, nd 21 (1) from influenza The figures in parentheses re those for London itself

Huddersfield reported the death from an enteric fever There ere 7 deaths from diarrhœa at Birmingham and 4 at Leeds ewcastle on Tyne reported 3 deaths from diphtheria

The number of stillbirths notified during the week was 28 (corresponding to a rate of 35 per thousand total irths), including 25 in London

---

In appreciation of his outstanding services to Westminster Hospital, Mr E ROCK CARLING, F R C S, has been elected vice president of the hospital

Letters to the Editor

"AN ACT OF TRUE BROTHERHOOD"

SIR,—At the annual meeting on May 21 I was re-elected president of the Royal Medical Benevolent Fund for the 25th year, and I would like to take this opportunity of expressing my personal thanks, and that of my colleagues, for the wonderful help you have always given to the fund All who have taken an active part in the administration of the fund realise how much is due to you, and to the medical press as a whole, for your unfailing willingness in giving publicity to our work, and for your cooperation in helping forward our various appeals to members of the profession It is a great satisfaction for me to realise that in the second year of war we were able to distribute as much financial help to our beneficiaries as during the days of peace, and also that the Christmas Gift fund was maintained at the same generous scale This would not have been possible without your personal help

I realise that the fund is held by many in very warm regard for the useful work that it has carried out for over a century, and my belief is that with your help the time will shortly be when every member of the profession will feel it to be, not only an obligation, but an act of true brotherhood in becoming an annual subscriber of any sum however small If all would remember, it is after all " our own Benevolent Fund "

1, Balliol House Manorfields,
London, S W 15

THOS BARLOW,
President, RMBF

*** The thanks are due not to us but to our readers to whom we commend the president's silver jubilee appeal —ED L

THE *DIPLOCOCCUS RHEUMATICUS*

SIR,—The letter by Colonel Copeman and Major Stewart in your issue of May 16 is naturally not only of personal interest to me, but a stimulus to any interested in acute rheumatism Researches commenced 45 years ago must surely be extended, improved upon, or set aside, and although in a confusional and ancient state of mind from the severe air-raids on Bath and the close call to my household and myself I do not fail to recognise this certainty I do not, however, think that Paine and I were dealing with two separate types of micrococcus and I have always thought it possible that a micrococcus which we thought produced the varied lesions of acute rheumatism including chorea (one of the chief associates with mitral stenosis) might, though rarely, cause meningitis and yet be the same micrococcus It is, I think, of interest that Wassermann, Westphal and Malkof, while our first paper was in the press in 1900, in their entirely independent research, observed that the micrococcus they had isolated took a diplococcal form in the tissues, a streptococcal form on culture This we had repeatedly noticed and dwelt upon We found diplococci in the tissue of a cardiac valve, a streptococcal chain in the pericardial fluid Diplococci grew on solid media, streptococcal chains in fluid media from the same original pure culture The German investigators, as we did, found it difficult to discover the micrococcus in the human tissues, though for us this became easier after studying the experimental lesions Unfortunately all our specimens have now been destroyed by enemy action —a loss, I think, to English medicine Lastly, I thank the writers for freeing us from the repeated statement that we claimed the diplococcus as the only bacterial cause We believed this to be the case and I still so believe, but to make a dogmatic claim in 1900 on a subject so vast and difficult was not in accord with our views on scientific research In 1942 I remain still of the same opinion

Bath

F JOHN POYNTON

LUBRICANT OR IRRITANT ?

SIR,—Your leading article of May 30 on liquid paraffin does not touch on one of its greatest dangers I have notes of several cases of cancer of the colon or of the rectum in patients who were in the habit of using liquid paraffin regularly as a laxative I have always regarded this substance as liable to set up irritation of the bowel when taken habitually, and am astonished that it should be so largely pres [illegible] octors when there are other

Obituary

HENRY HERBERT TAYLOR

F R C S J P

Dr Herbert Taylor died at Steyning on May 25 in his 84th year. An old rugby international, he was a general practitioner for 45 years in Brighton with a leaning towards ophthalmology, a magistrate for Hove and an alderman of the town council, and on his retirement to the beautiful mediæval house overlooking the South Downs time did not hang heavily with him and only after a stroke some three months ago did his physical powers fail. Taylor qualified with distinction from St George's in 1881 and held house-appointments at the West London before going to Brompton where he was for many years resident medical officer under Percy Kidd with whom he learned the value in clinical diagnosis of the newly discovered tubercle bacillus. After taking the surgical fellowship in 1887 he settled in Brighton and was appointed surgeon to the Royal Alexandra Hospital for Sick Children. Later he joined the staff of the Sussex Eye Hospital and ended by limiting his practice to this specialty. His work took him a good deal as an expert witness into the courts where his evidence was always unbiased. In 1913 he was treasurer to the annual meeting of the BMA held that year at Brighton but he parted from the local division as he did not agree with the official health-insurance policy. From 1914 to 1918 he was attached to the 21st Eastern General Hospital with the rank of major. As a magistrate he worked for establishment of juvenile courts and was a firm believer in the value of psychological examination of the young offender, as chairman of the Watch Committee he had useful contact with the police. In all his dealings, writes L A P, his honesty and straightforwardness were outstanding. His colleagues, who made him president of the local medico-chirurgical society, knew he was incapable of a mean action.

HENRY THORPE STEWART

M B BELF, CAPTAIN R.A M C

Captain T Stewart, who died as the result of a riding accident on March 28, was born in 1916, the son of the Reverend David Stewart of Belfast. He was educated at the Methodist College and the Queen's University, where he obtained his medical degrees in 1939. After a short period of residence at the Stockton-on-Tees and Thornaby Hospital he joined the RAMC in February, 1940, and saw service in the Middle East till he was invalided home last December.

ISAAC ALEXANDER DAVIDSON

M.D. R U I, D P H

Dr I A Davidson died at his home in Belfast on May 15. He was the son of James Davidson and was born at Frevent in France in 1869. He was educated at the Methodist College and at Queen's College, Belfast, where he graduated with honours in arts in 1899 and M B R U I in 1892. Later he took the M D of the Royal University, and the D P H of Cambridge. After a house-appointment in the Royal Victoria Hospital, Belfast, and postgraduate study in Vienna he began practice in Belfast. He soon became interested in diseases of the eye, ear, nose and throat, and joined the staffs of the Ulster Hospital for Children and Women and the Benn Ulster Eye, Ear and Throat Hospital in 1914. During the last war he served in the RAMC as an ophthalmic specialist. He was a past president of the Ulster Medical Society and the Irish Ophthalmological Society and a member of the Ophthalmological Society of Great Britain and Ireland.

Davidson never lost his early love for France and had an extensive knowledge of her literature and her scientific progress, particularly in ophthalmology. He sustained a coronary thrombosis last summer and never regained his health, but his courage and cheerfulness and his for the best in prose and verse helped him and the came suddenly. He leaves his widow with one d and two sons, one of whom is serving in the Duke Wellington's regiment and the other as a lieutenant in the Royal Navy.

JOHN CHRISTOPHER HAWKS

B M OXFD, LIEUTENANT R A M C

Tunbridge Alder

Lieutenant John Hawks, who was killed during c bined R.A.F and Army exercises on Salisbury Plain April 19, was the son of Dr F Swanson Hawks Liverpool. Hawks who was twenty-eight years of was educated at Epsom College where he was head the school, captain of rugby and captain of cricket. In 1932 he entered Magdalen College, Oxford, with a classical scholarship. He took honour moderations before he made up his mind to study medicine, and began his hospital work at KCH in 1936 where he once more proved his all-round ability at work, games and student affairs. In 1940 he obtained both his M A and B M degrees. After holding house-appointments at King's and at an EMS hospital he joined the RAMC in October of last year and served with the Royal Artillery and a field ambulance before he was posted to the London Scottis as battalion medical officer. John Hawks had ra gifts of organisation and leadership. He understoo other people and their problems; his patients foun him a comforter and a guide, and letters from friend reveal something of the trust and affection they had fo him. Dr Hawks married Miss Sara Rosamund Del last June.

REGINALD CARMICHAEL WORSLEY

M R C S

Dr Worsley, who died at Nottingham on May 22 a the age of 77, had a life of varied practice that gav him a wide experience. After qualifying from UC in 1891 he practised for several years at Ramsgate, bu in 1900 the Boer War took him to South Africa, wher he settled in practice at East London, holding th appointments of medical officer to H M Customs an of constructional medical officer to the Cape Governmen Railway. He returned to England in 1907 and practise for many years in Coventry and later in Devon and a Carlton, Notts, where he died—as he had always wishe—in full harness. Dr Worsley leaves a son and daughte by his first marriage. By his second wife, who surviv him, he also had a son and daughter.

His son, Dr Allan Worsley, writes: Interest in hi work and inflexible devotion to duty were my father' basic code of life. He had deep but simple religiou convictions and I can see him now in one little Devonshire church, wearing his surplice as the only member o the choir. He was fond of music, especially singing wood-carving, sketching, and painting, but of late years all his interests were centred upon his work.

WILLIAM BRAND

B A MANITOBA, M B EDIN

Dr Brand who died at Shaftesbury on May 20 ha recently retired from the position of senior tuberculosi officer to the metropolitan borough of Camberwell. There and as medical commissioner to the Nationa Association he had done his public work, and in hi spare time he was treasurer to the Tuberculosis Society and organised postgraduate courses for the Joint Tuberculosis Council. To know William Brand, write J W, was to trust him and to think of him with affection. Naturally shy and retiring, perhaps the result of sufferin and ill health, he was called upon by his fellows to serv in positions of responsibility which he did not seek but the duties of which he carried out faithfully and efficiently. Sensitive though he was, he could be strong in defence of the principles in which he believed and his intellectual honesty had no patience with pretence.

PSYCHOLOGY AND CHILDBIRTH *

ERNEST JONES, M.D., F.R.C.P.

VARIATIONS and difficulties in childbirth are brought out not only by the familiar physical agencies but also the personality of the patient. Neurotic attitudes ke the patient hard to guide, control and help, and y have indirect effects on the course of labour itself, d indeed of the whole pregnancy. They are commonly missed as nuisances, but to try to cope with these ficulties by studying and understanding them is eresting and beneficial. The neurotic difficulties in nexion with childbirth are much more complex than generally thought.

Childbirth is such a tremendous emotional experience it one may say a woman's emotional reaction to it is entially determined by elements in her earliest development, although these elements are completely unknown her and are of a quality alien to her conscious rsonality.

In the first three or four years of life sexual sensations, pulses, and attitudes of mind play an important part. ey are all buried and forgotten subsequently, but they ofoundly influence the mind for the rest of life. alousy alone is enough to stimulate interest in the urce of babies, possibly coupled with a hope of being le to prevent such undesired occurrences, and there e deeper motives still for that interest. Young children now instinctively, as well as from direct observation of egnancy, where babies come from. They can have no nowledge of the womb or any other internal organ. heir knowledge of the inside is derived solely from such periences as eating, colic, and defæcation; in other ords, the child's idea of the inside of the abdomen is sentially an intestinal one, and this in its turn colours in portant ways the later attitude to pregnancy and bour.

Favourite infantile theories of childbirth are that the ild is expelled through the only opening known at that ge—namely, the anus—or that someone cuts the bdomen open—a kind of Cæsarean section—the navel eing the centre of operation. We may call these alternatives the anal or sadistic theories respectively, and both lay a part in the later attitude towards childbirth.

Mutual envy between the sexes is common in early hildhood, and of course in more disguised ways later in fe. The male one, envy of the female's capacity to ive birth to children, is less recognised than its counterpart. It seems to find adequate indirect expression in he creative productivity widely open to men, but races of it are often to be found in its unaltered form. t may well contribute to the various motives at work in he curious custom of couvade, in which the husband up o the last moment acts the part of the wife in labour. Here a plea might be entered for the much neglected heme of the treatment of husbands during labour. Some of their anxiety and distress can be alleviated if one recognises that much of it originates in remorse at he sadistic elements that cooperated in bringing about heir wives' happy but painful state. The anatomical nvy of little girls is fairly well known, although it is easy o forget the central part it plays in women's envy of men, which they prefer to explain on more rationalistic grounds. There are many reasons for it in childhood, but a prominent one that concerns us here is the little girl's belief that the possession of a penis would give her more power to control her sphincters and guard against the accidents that so commonly get charged with terrific meaning in her mind. So strong is this wishful thinking that in the unconscious mind it may prevail against the four great experiences of feminine life that would logically destroy it and convince her of her feminine destiny. These experiences, while gratifying the desires that accompany normal female functioning, also unfortunately cater to the deepest fear in the female heart—that of being torn open and damaged internally. They are the child's observation that she is anatomically endowed with an open place (often neurotically misconstrued as a wound) in lieu of visible external structures; menstruation, with its disconcerting flow of blood; the first coitus, involving rupture of the protective hymen; childbirth with all its pain and danger. Especially in the last three of these, malicious females are seldom wanting who play on the fears of the individual concerned by retailing beforehand gruesome stories of horrors and perils.

The influence emotional processes exert on the course of pregnancy and labour depends in the last resort on the woman's attitude towards the vital content of her body, the unborn babe. Does she, deep in the unconscious, feel it to be something "good," invested with love and pride, or something "bad," associated with hatred and danger? It is evidently akin to the increasing repugnance to bearing children which in another generation or two may well lead to a critical social and national situation almost rivalling that of the present war. Behind the important economic and social factors in this repugnance lie deeper ones to which the psychologist can point. The relationship to the husband is only the most obvious of them. At a deeper level, the responsibility of becoming and being a mother has in the unconscious mind often to cope with the forbidden wish to oust the mother and take her place, a conflict which adds its inhibiting effect to others. Then there is what I just called the woman's deepest fear concerning her body, which often lurks behind the more superficial excuses concerning the effects on her figure, mammary and abdominal cicatrices, perineal tears, and so on.

If her attitude towards the unborn child is purely positive, the course of the pregnancy and labour is, apart from physical complications, smooth, and is accomplished with love and pride. More often, however, though in very varying degrees, the child has become unconsciously identified with the fanciful introjected "internal objects" to which Melanie Klein has called so much attention, and the attitude towards it gets coloured by the mixed feelings with which the internal objects (breast, penis, fæces) are invested. These fanciful ideas of internal objects, of things inside one, which play a very important part in the mental development of children, are the concrete expression of emotional attitudes towards the parents, love, hate, envy, guilt, and so on, and they are the chief source of the fears that haunt children. The internal damage to which I have referred is one of the feared effects of what is inside the body and what it may do there; explosive accidents from loss of control of the sphincter muscles often acquire an exaggeratedly terrifying meaning in this sense, one which is echoed during the process of labour. All this may be put in a simpler way by saying that in labour the woman's true character is revealed. If it is harmonious and loving, all goes well. If it contains conflicting elements of hate, resentment, envy and fear, then they reflect themselves in disturbances of the labour process. If a woman has unconscious ideas of hatred, guilt or fear concerning the fruit of her womb (or the other older internal objects with which it has become identified) they may affect the physiological processes at play in one of two ways: by inhibiting the nervous mechanism of the normal expulsive movements or by exaggerating these in a violent, incoordinate and ill-timed fashion. Which of these two effects will come about will depend on the psychology of the complex in question. If the unconscious mind hopes—if I may so translate its attitude into conscious intelligible language—that it can achieve wholesomeness by expelling the bad thing, then we have the second, violent effort. If, on the other hand, it more pessimistically fears that the bad thing will by the act of expulsion damage the body, or if it dreads exposing to the outer world the badness that had been harboured (hence so many women's fears of birthmarks, deformities and other imperfections in the baby), then we have the former, retentive effect.

The phenomenon of inhibition is familiar enough; it is what obstetricians term primary inertia. Constipation is another example, an intelligible one when we remember how extensively the alimentary canal is identified with the inside of the body in the unconscious—the infantile—mind. Irregular and ill-timed violence in the expulsive movements is among the causes of secondary inertia, and even apart from that extreme effect it may grossly impair the harmony that should attend the process of childbirth. In pregnancy also the same psycho-physiological tendency may be seen at work. Much of the vomiting of pregnancy—I do not of course refer to pernicious vomiting of hepatic origin and the

---

* Extracts from an address delivered to the West Sussex Midwives Association on Jan. 28.

much more efficient and safer remedies I think my experience of cancer cases cannot be merely a coincidence At any rate I am so convinced of the truth of my contention that I never prescribe it, and advise patients who take liquid paraffin to give it up *In this way one plays* for safety, and is taking no risk

Edinburgh JAMES BURNET

ESTIMATION OF SULPHONAMIDES IN THE BLOOD

SIR,—In your *annotation of* Nov 8, 1941 (p 571), you point out the difficulties experienced in *matching* the different colours given by sulphanilamide, sulphapyridine *and* sulphathiazole with *a common wedge* If thymol is used as the coupling compound (G V James, *Analyst*, 1940, 65, 206) we have found that the colours given by diazotised sulphanilamide and sulphapyridine *are* very similar Photoelectric analyses of these colours given almost identical absorption curves It should not be very difficult to make up a disc for a Lovibond comparator for use in the estimation of these two drugs in blood We have no experience with sulphathiazole The methods of James have proved very satisfactory here in experimental work on blood levels and excretion of these drugs Initial deproteinisation with nascent zinc hydroxide has however proved more satisfactory than the use of trichloracetic acid

Royal College of Medicine,
Baghdad ERNEST S HAWKINS

LOCAL SULPHONAMIDES

SIR,—The opening sentence of your leader of May 23 was provocative *It read,* " Just over two years ago the sulphonamides began to be locally applied " Five and a half years ago A W Purdie and R M Fry described the local use of sulphanilamide in the *Lancet* (1937 ii, 18) The streptococcal infection described was dealt with by both general and local therapy This early use of sulphonamides locally thus followed close on Leonard Colebrook's historic work on general sulphonamide therapy In view of the extensive and extending use of local chemotherapy it would be interesting to determine when it was first used and who first suggested it

Carmarthen J R E JAMES

LIBRARY FACILITIES FOR STUDENTS

SIR,—In these difficult times library facilities for students have become greatly curtailed Books, and especially original papers, are now hard to obtain It would therefore be an act of grace if those libraries now remaining in London would remove the restriction which refuses unqualified students the right of admission to their books, and more important their current journals

St Thomas's Hospital
Medical School F B CHARATAN

Medical News

University of London

At recent examinations the following were successful :—

FINAL EXAMINATION FOR M B , B S

O J Champ, I M Hill, T L Kennedy, Vera J McMullen David Weitzman, (with honours) , J N Aston, W J Atkinson, Geoffrey Auckland, Victor Blackman, V M Borrelli, V R Bruce B S Cardell, Lilian M Chant, Ralph Citron, D M H Cogman, A F Crick J H Dadds, J A L Davies, Joyce A Davies G S Davis, Elizabeth S A de Wit, Mary R. Ellis, D T R Evans, P R C Evans, R J Evans, P J Fawkner Corbett, H P Ferreira, H McD Forde, H D Freeth, W W Gooddy, J P Haile, Prudence Halton, G T Hammond, Margaret Hargreaves, R A Henson, A C Higgitt, Ernst Hirschowitz, T D S Holliday, D D A Jayamanne, P G S Johnson, A K Jones, E P Jones, H P Jones, Richard Keen, G C Kennedy, Ursula M Lister, B S Lush, G E McFall Annabella J McGowan, Thomas McKeown, E T Manley, H N Mansfield, Betty M Margetts J K Martin, V H Martindale, L W C Massey, P B Maxted Basil Messer, Christine M Millar L F Miller Joan S Millett, B B Milstein J A U Morgan, T K Morgan, F W Nash, K R Ogilvie, L J Page, A C Parkinson, J N M Parry, Asher Pearlman, Phyllis Poyner Wall, R J W Rees, P B Riley, D J Robertson, G K T Roche, C F. Ross, R T Routledge, C F Scurr, K N Sinha, J S Stead S D Stock P H D Stone, S J Sutton, D H Teasdale, Margaret V Teichmann, E B Thornton, Arthur Tickner, K R Todd D J Trevan P S Tweedy, Albert Venner, P M Vicary, C E M Ware, P C Watson, K T Weavers, E J E Webb, F. T Wheeldon, John Wilks, P N Wilman and J M Wilson

National University of Ireland

Dr Michael MacConaill has been appointed to the chair of anatomy at University College, Cork

University of Cambridge

On May 23 the degrees of M B , B Chir were conferr H L McMullen, A P Bentall and C N Carter by and on R D S Rhys-Lewis

University of Aberdeen

In order to allow the present fourth year medical stu to graduate in October, 1943, it has been decided to int a vacation term for them During the coming vacation they will complete the work prescribed *in te* of the calendar The work of the 14th, 15th and 16th will be done during the winter, spring and summer ter 1942–43, and the work of the 17th or final term durin summer vacation of 1943 In this way they will com the curriculum two terms earlier The coming vacation will open on July 21 and close on Sept 25

The DPH courses have been discontinued *for the du* of the war

Royal College of Surgeons of Edinburgh

The hon *fellowship of the college has been conferr* Lieutenant General Alexander Hood, C B , M D , dir general Army Medical Service, *and on Prof A T J* M D , dean of the Polish Faculty of Medicine in Edinbu

Society of Apothecaries of London

The *following* candidates, having completed the examination, are granted *the diploma of the society* ent them to practise medicine, surgery and midwifery Miller, St Mary's , N F Murphy, Lond Hosp , C Taylor, Msx , J J Wild, Camb and UCH

Royal Society of Medicine

On June 9, at 4 30 P M , at the section of psychiat discussion on the effect of war-time industrial condi on mental health will be opened by Dr H E Collier W Blood and Dr J Harwood At 5 P M , at the sectio therapeutics and pharmacology, Dr Robert Cruickshank read a paper on the chemotherapy of intestinal infect and Dr Horace Evans a paper on reactions following merc diuretics On June 10, at 5 P M , the section of procto will discuss the treatment of inoperable carcinoma of rectum On June 13, at 2 15 P M , the section of orthopæ will meet at Ely for a clinical demonstration Member other sections wishing to attend should notify the secretary of the orthopædic section

Tuberculous Women Registrants

Medical officers of health for counties and county metropolitan boroughs are required to supply informa to local offices of the Ministry of Labour and to head o for the recruitment of WRNS about the tuberculous his of women registrants New regulations (Circ 2648) is by the Minister of Health make it clear that though information required will be the same as that required men it need not be supplied for all registrants but only those women who are actually to appear before a me board

Ocular Changes in Nutritional Disease

At a meeting of ophthalmologists and others intereste nutritional problems at the Sheffield Royal Infirmary May 23, Mr Wellwood Ferguson, the chairman, recalled Kruse (*Publ Hlth Rep Wash* 1941, 56, 1301) ascribed cer conjunctival opacities to vitamin A deficiency, and Seb Cleckley, Kruse and Sydenstricker (*J Amer med Ass* 1 **114**, 2437) demonstrated a relationship between vascula tion of the cornea and ariboflavinosis To evaluate the s ficance of these findings and to exclude other possible logical factors—for example, chronic irritation or age cha —*a slit-lamp study of the eye was in progress in* Sheffiel detect signs of deficiency of vitamin A and riboflavin hoped that similar investigations would be started elsewh Prof V P Sydenstricker, of the University of Geor described the ophthalmic signs of riboflavin deficiency as in the southern United States

Captain G S ELLISTON, M P , has been created dep lieutenant of the county of London

The council of Epsom College will report to the governor the Royal Medical Foundation at their 89th general meet to be held at 49, *Bedford Square,* London, W C 1, on Frid June 19, at 4 P M

AIR ACCIDENTS DURING TRANSFUSION

KEITH SIMPSON, M D LOND
ASSISTANT LECTURER IN FORENSIC MEDICINE TO GUY'S HOSPITAL

WHENEVER air-embolism is discussed there is certain to be a great deal of vague and uninformed talk varying from the extreme which doubts its existence at all to a remarkable diversity of opinion as to the quantity of air likely to be fatal So much of this is mere conjecture that one might imagine there was no literature or experimental observation on the subject When it is mentioned in the demonstration of medico-legal autopsies I often meet the reserved reception one met in cases of fat-embolism before the latter became more widely recognised No doubt whatever can be entertained as to its existence, for the literature is now very extensive and reliable experimental work (Chase 1934, Harkim and Harmon 1934, Wolffe and Robertson 1935, Richardson et al 1937) supports its authenticity It is seldom, however, that one hears discussed the vital question *how much air constitutes a danger to a person already nearly* *d* This is the problem which is encountered in transsion, the question how much air and over what riod such a quantity of air is dangerous to healthy rsons is there of academic importance only This communication is made with the double object of drawing tention to this vital point and illustrating some of the echanical dangers of transfusion The increasing use of is procedure has naturally brought with it a familiarity hich may breed contempt for its mechanical dangers the cases selected for description here forgetfulness of ese dangers or contempt for them was responsible for eir occurrence Indeed in two of the cases the apparas was described as "foolproof" and air-embolism erefore not envisaged as a possibility

During the ten year period 1932–42 fifty-six fatal cases air-embolism were examined during the course of edico-legal practice They were as follows

Cut throat (varying but material degrees of air embolism accompanying loss of blood)	23
Operative (other than venesection)*	10
Criminal abortion injections	7
Stabbing wounds	5
Venesection (for transfusion)	4
Thoracotomy or pneumothorax	4
Caisson disease	1
Spontaneous (intragastric, intrapulmonary)	2
Total	56

* Including cases where air embolism of a material degree occurred at was not alone responsible for death

f these, the transfusion group of 4 alone is selected for iscussion here

RECOGNITION AT AUTOPSY

Much of the failure to afford air-embolism the position t deserves is due to slovenly autopsy technique—or worse, o the failure to bear its possibility in mind until too late ny case in which it is a possibility should be approached y the technique which will reveal it, for no harm can esult whatever the nature of the autopsy in question.

It is essential that the body should be fresh and entirely ree from post-mortem gas genesis, this difficulty has risen in my own experience more frequently in criminal bortion injections where decomposition sets in early t is quite unsafe to venture opinion under such circumtances The examination is best begun by exposing, ut not yet opening, the system of veins which lead to the eart from the site where it is suspected air may have ecome introduced Sometimes bright red frothed lood will issue from the opening in these before they are andled, thereby indicating the exact site of entry More often, however, and always when the quantity of ur is small or has been introduced slowly, the condition ill be revealed as a colour change in a vein together ith a string of small air bubbles, both of which continue nd may be traced by reflecting the skin and turning side organs as far as the right side of the heart Once vein is opened or organs are removed air may be ucked in by handling, and the same reddening colour hange will, of course, gradually develop It is not ecessary to perform this procedure under water Only hen it is desired to collect the gas from the body does his become more or less essential Immersion of the whole body is a cumbersome affair, and it is in practice *sufficient to form a " pool " of clear water over the site of* entry and a second over the right side of the heart by filling the pericardial sac or the anterior mediastinum and collecting the gas in funnel-mouthed glass U tubing As soon as a waterlock is formed over a vessel or a blood chamber it may be opened for the collection of gas bubbles, the parts being " milked " with care to facilitate this The procedure is not difficult, it demands only care and patience

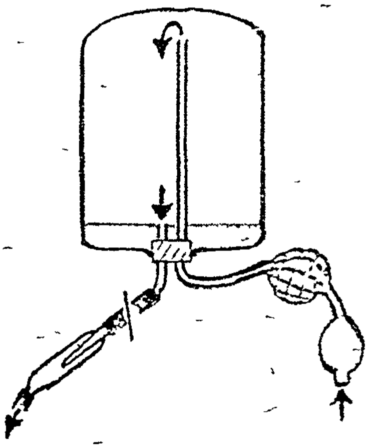
Unfortunately there is no means by which the exact volume of air which has entered the body can be measured Much of the oxygen has become absorbed while life was still present so that only part of this gas together with the irrespirable nitrogen (and minute quantities of other gases) remain for collection, and no small part of this lies locked in innumerable small vessels beyond practical reach The measurement of the volume of air or gas in any given case at autopsy can only amount to an approximation

CASES OCCURRING DURING TRANSFUSION

CASE 1—A woman, aged 68, was admitted to hospital for nephrectomy, and the operation was completed without mishap between 3 20 and 4 P M She was returned to bed and during recovery from anæsthesia an intravenous saline infusion was begun The apparatus was erected and working by about 4 30 P M The drip, which was continuous and under visual control, was set to give about 1 drop every 1½ sec The reservoir was emptying under hand pump pressure, and at this speed the nurse in charge estimated that it would not be empty until 10 P M, 5½ hours later At 9 20 P M, however, it was noticed that the patient was collapsed, cyanosed and with shallow stertorous respirations The house-surgeon found her dead when he arrived a few minutes later

The cause of her death was not then clear but it was established after autopsy had shown a massive air-embolism that the reservoir had emptied itself to a level at which the fluid could no longer enter the drip The air chamber had increased in size as the saline ran away and eventually covered the outgoing flow tube (fig 1) Air (under pressure) would at once become poured into the vein at a fast rate and this would quickly result in a big volume accumulating in the right heart and the bed of the lungs A track of bright red frothed blood could be traced at autopsy from the vein into which the needle had been inserted through the right side of the heart and into the lung None was found in the arterial system

Fig 1



CASE 2—A man, aged 51, who had been admitted to hospital for repeated hæmorrhages from a chronic gastric ulcer, was prepared for blood transfusion at 11 15 A M, a continuous drip being established through a view chamber equipped with a lateral pressure control tube closed by a clamped rubber. The drip was arranged to work very slowly, and although given through a French needle the flow ceased at about 1 15 P M, 2 hours later The needle was withdrawn and inserted at once into another vein, the same rate of flow being set During this time the man's general condition, which was poor, gradually became serious The bleeding became prolonged and gasping, and eventually assumed Cheyne Stokes rhythm He became drowsy and eventually unconscious, dying at about 3 P M, 3¾ hours after the commencement of transfusion.

Autopsy revealed nothing abnormal in either venepuncture, but a thin trail of bright red frothed blood led from the second vein used to the right side of the heart and thence into the lungs Occasional bubbles were also to be seen in the coronary and cerebral arteries Examination of the apparatus revealed like—usually ascribed to reflex action has really a psychological origin in the unconscious effort to expel the foreign, and therefore bad, object Lastly repeated miscarriage is also often related to the same tendency.

RECRUITMENT OF HOSPITAL MEDICAL STAFF

THE Ministry of Health will shortly be communicating with hospitals about the further recruitment of medical staff to meet the urgent demands of the Army In the past difficulty has arisen because members of the staff have to be submitted for commissions before they are medically examined, and a successor is often provisionally appointed before it is known that the doctor selected will be accepted by the Services This does not matter so much in the case of holders of junior appointments, who can readily be transferred to other employment, but may be serious with more senior men Moreover, hard-pressed hospitals have been known to release doctors who are obviously ineligible for recruitment In future, therefore, male medical staff of all hospitals other than mental institutions, if they were under 46 on March 5 last and are in the following categories, will be examined by Army medical boards when notified by the central or local medical war committee

(*a*) Holders of whole-time appointments classed as B1
(*b*) Other officers enrolled in the EMS in class 1 or 2, and those of specialist grade in class 3
(*c*) Others practising exclusively as specialists and holding part-time appointments at the hospital

It is hoped to arrange for travelling medical boards to visit each hospital for this purpose Doctors will be told their medical grading Special tests of fitness are required for the Royal Navy, the RAF and the IMS, but a doctor who fails in these may still be accepted by the RAMC Medical examination should make it easier for hospitals to plan ahead, for men found to be unfit can be employed with the knowledge that they are not likely to be disturbed

Births, Marriages and Deaths

BIRTHS

BAILIE —On May 25, at Belfast, the wife of Captain H W C Bailie R A M C —a daughter

COBBE —On May 26, at Oxford, the wife of Captain C I Cobbe, R A M C —a daughter

DOBIE —On May 23, at Chester, the wife of Dr J M Dobie—a daughter

FISHER —On May 24, at Salisbury, the wife of Surgeon Commander H H Fisher R N —a daughter

KERR —On May 24, at Worthing, the wife of Captain E J Kerr, R A M C —a daughter

MELLOTTE —On May 17, at Walton on Thames, the wife of Mr J H Mellotte, B CH —a son

SADLER —On May 26, at Penrhyn, the wife of Lieut Colonel C R Sadler, R A M C, of Cheltenham—a son

SEWARD —On May 25, at Exbourne, Devon, the wife of Lieut Colonel C M Seward R A M C, of Exeter—a daughter

SIMMONS —On May 26, at Bowdon, Cheshire, the wife of Lieut Colonel H T Simmons R A M C —a daughter

SYMONDSON —On May 20, at Inverness, to Dr Alicia M Symondson (née Lewis), wife of Captain J E Symondson, R A M C —a daughter

MARRIAGES

DURSTON SMITH—MITCHELL —On May 30, at Bath Captain Henry Durston Smith, M B, R A M C, to Eileen Isabel Ashley Mitchell

KEESEY—HARVEY —On May 25 at Buscot, Berks, J H Keesey, M B, lieutenant R A M C, to Susette Harvey

McFARLANE—HILL —On May 30, at Warwick Michael McFarlane M B, late of Acton, to Kathleene Betty Hill

DEATHS

CADDELL —On May 27, at Farnham Surrey Ernest Duncan Caddell, M C M B DUBL lieut colonel R A M C (rtd) *sometime secretary* National Association for Prevention of Tuberculosis

CHAMBERS —On May 29 at Chard Somerset, William Francis Chambers, M R C S, late of Folkestone

KNOWLTON —On May 31 at Southampton, Alexander John Knowlton M B LOND, J P aged 70

SUTCLIFFE —On May 28 at Old Colwyn, John Sutcliffe, M R C S, late med supt Cheadle Royal

TAYLOR —On May 25 at Steyning Sussex Henry Herbert Taylor L R C S, J P, late of Brighton aged 83

TURK —On May 29, at Edinburgh, Martha Turk, L R C P E

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export

CONFERENCE OF SOCIAL BIOLOGY

THE British Social Hygiene Council has arranged a conference on June 6 and 7 at BMA House, Tavistock Sq on some aspects of social biology in relation to the war Saturday morning, June 6, from 10 30 A M to 1 P M, subject will be "Three Problems of Social Hygiene," Dr Otto May in the chair The openers are W Commander R D Gillespie, on the borderline type in th effort, Major Denis Carroll, R A M C, on the scientific ment of delinquency in war-time, and Mrs C Nev Rolfe on the social implications of venereal disease F 2 30 to 5 30 P M the subject will be "The Human F in Production," with Mr Clement Davies, M P, in the chair The openers are Dr May Smith on "What do we know of th human factor?", labour managers and welfare workers o opportunities and limitations of labour management an welfare, and Rev J Leycester King, S J and Mr A Wolter on constructive suggestions The final discussion will be o Sunday from 10 30 A M to 1 P M on "Population Problem with Lord Horder in the chair Mr Richard Titmuss wil open on population problems today, Mr François Lafitt on present practice and barriers to parenthood, and Pro F A E Crew, F R C S E, on the birth rate and the post wa world *The conference will end with a public meeting in th* Great Hall of BMA House at 3 15 P M, when Mis Maude Royden will take the chair The subject will be "Th Life Sciences and Ethical Values" and the speakers Profe Crew, Dr Julian Huxley, F R S, Mr Richard O'Sullivan K C and Miss Barbara Ward

INSTITUTIONAL CONFINEMENTS —In the report on p 6 (issue of May 30) the 4th line of Dr Allen Daley's remark should read In 1930 there were 10,000 confinements in LC hospitals, in 1938 there were 21,000

Air Commodore A E PANTER has been appointed a honorary surgeon to the King, in succession to Air Commodor A S Glynn

AT SURGICAL CONSULTATIONS

1 S	2 T	3 U	4 D	5 E	6 N	7 T	8 Y	9 E	10 A	11 R
12 I	N	N	C	C	E	N	T	13 L	N	U
14 R	E	15 U	P	I	16 E	E	N	K	17 R	B
18 I	S	19 S	E	N	D	20 B	E	21 N	I	22 H
23 U	24 N	25 U	26 M	27 R	S	28 O	29 U	A	H	A
30 Q	U	A	31 E	S	32 S	33 P	34 I	35 H	36 C	37 C
38 A	B	L	39 E	40 I	41 I	42 O	N	43 A	44 K	K
45 M	46 A	47 N	48 I	A	T	49 F	50 E	D	51 O	52 S
53 S	T	E	A	M	54 E	T	55 F	I	N	D

Robert Genty, M (17 dn rev), next showed (10) (3) case that a (17 ac rev and 46) with a swollen (9 rev) on which he invited th (28, 34, 41)s of his colleagues (1 dn) Charles (8 dn rev) hi cousin, said, ' I (38 dn) sure this swelling (18 ac) far from (19) (34) my (28, 34 41) it (6) (10) immediate (38 dn, 15 rev, 48 41 at the (9 rev) ' The next piece of (4) came from the Persia Mr (21 rev) who said (13 rev, 31) the (32) of (38 dn, 15 rev, 4 41) (20) above the (16 rev) there (18 ac) (42 47 rev) recurrence He took the (24 rev) when he added, " The (16 rev) (30) (16 rev (18 ac) neither useful (44 rev) *ornamental* I (22, 54 rev) to sa (51 rev), but (49 rev, 14 rev) (28 14 rev, 46 41) for a (8 ac) an you'll (55) it will (20) all (15) with the patient " The (27 ac) very (38 ac) (45) said he was (23, 38) to decide whether the (3 of (38 dn, 15 rev, 48, 41) (35) not better (20) (46) the (33 rev) how to avoid recurrence that was the (24) The Senior Surgeon who (35) been (27 ac) (34) the (43) exclaimed ' My good (18 ac rev 27 dn)! Why not perform (38 dn, 15 rev, 48 41) (46) bot (33 rev)s, and make (18 dn rev 54 rev) (18 dn rev 54 rev) sure At once (49 rev 14 rev) this (50 rev, 46) and all (18 ac) (15), (19 him (34) today " Then (15) spake a first (8 ac) (1 ac) "M (9 dn rev) was (7 rev) like that (46) school once when it (35) (35) (22 37) at (51 rev, 36 14 rev) The (40 rev 44) (2 rev) (26) *to th* (30, 37) who (2 rev) (26) some (5 rev) (25 rev, 37) to (11) (34) an *it went like* (53) Shall I write to the old (29 rev) and (55) ou what the (25 rev, 37) was?' (51 rev) (47 rev, 52 rev) my story

RETENTION OF INJECTED SERUM IN THE CIRCULATION

E P SHARPEY-SCHAFER
M R C P

JOHN WALLACE *
B SC , M B EDIN

With the technical assistance of A C PINCOCK

(Department of Medicine, British Postgraduate Medical School)

THE extensive use of solutions of human plasma protein in the treatment of casualties has suggested further investigation of the behaviour of such solutions in the circulation Freeman and Wallace (1938), using the dye T-1824, calculated the plasma-volume in two dogs before and for three hours after the injection of concentrated serum They found that serum was retained in the circulation for this period, while saline and glucose solutions were not Twenty-four hours later, however, there was no difference in plasma-volume whether serum or saline had been injected Robertson (1938) found that both serum and saline disappeared rapidly from the circulation of normal anæsthetised ts, and of cats after an acute hæmorrhage In this ecies hæmorrhage is followed by rapid dilution obertson 1935), while in man the process of dilution is ower (Ebert, Stead and Gibson 1941 , Wallace and arpey-Schafer 1941) Florey and Jennings (1941) also und rapid disappearance of serum from the circulation cats, and that there was no change in plasma proteins ter injection of concentrated serum Marriott and ekwick (1940) state that the plasma-volume remains nstant after whole-blood transfusion to man, provided e transfusion is slow, suggesting that the plasma portion the transfusion is eliminated from the circulation a previous paper (Hill et al 1940) we studied the dilu- on of hæmoglobin after injecting saline and serum In bjects with stable blood-volumes dilution after saline as not maintained, while in four subjects after serum was maintained At the time of publication a fifth bject had shown only a small and transient fall of æmoglobin after serum, associated with generalised rticaria It was felt that this might be an abnormal action and that further work was necessary Figures r hæmoglobin after serum injection published by ayward (1942) also show dilution over one, two or ore days in several cases Our present findings dicate that generalisations from the original observa- ons on four subjects would be erroneous, as there is onsiderable variation in the time of retention of injected erum in man

The term "stable blood-volume" is used here to mean hat the circulating volume has not been acutely reduced or ncreased by experimental procedures prior to the observa- ons In view of individual variations it is preferred at the re ent stage to the term "normal blood volume," since the recise definition of normality in this connexion is difficult

This paper describes the effect on hæmoglobin concen- ration of injecting serum into subjects with (*a*) stable lood-volumes, (*b*) blood-volumes acutely reduced by enesection

METHODS

The observations were made on convalescent subjects without circulatory disease

The use of serial hæmoglobin determinations to follow the retention of injected protein solutions in the blood- tream is open to possible criticism The method of determination and of sampling, proper mixing, stores of red corpuscles, and effects of posture and temperature have all to be considered It is also necessary to assume that injected serum has no considerable specific effect on the recipient's corpuscles Since comparative readings only are required, no absolute hæmoglobin standard, related to iron content or oxygen-carrying power, is necessary There appears to be no evidence in man that stores of red corpuscles may be swept into the circulation and give false readings (Ebert and Stead 1941) Hahn and others (1942), from experiments on dogs, state that 20% of the total plasma volume is contained in peripheral, cell free, sluggishly moving plasma films, or in small vessels in which no red cells are present It may be therefore that hæmoglobin determinations only reflect changes in the "rapidly circulating blood-volume"

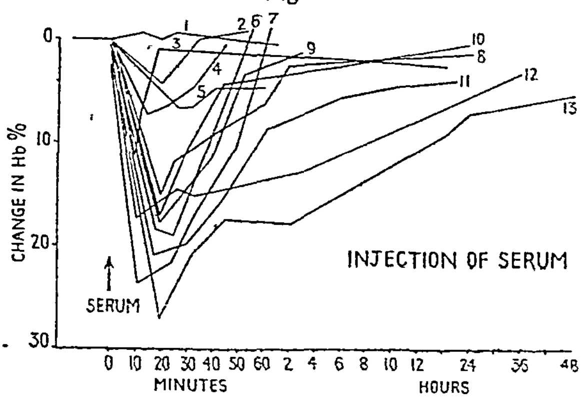
Experiments were performed recumbent, with the trunk at an angle of 30° Time was allowed at the beginning for the hæmoglobin percentage to adjust itself to any small changes in posture The subject was kept at a warm uniform temperature The standard hospital diet had been taken for some days previously, and no attempt was made to control water intake All observations were started two hours after the midday meal Hæmoglobin was estimated by a photo electric method (Hill and Pincock 1941), 0 02 ml samples of blood being obtained from a freely flowing ear puncture Plasma proteins were estimated by the method of King, Haslewood and Delory (1937) Protein solutions used were as follows (1) Dried serum, each bottle containing dried solids from 200 c cm human serum diluted to 200 c cm with distilled water, referred to in the text as serum , the estimated protein content of these solutions lay between 6% and 8% (2) Similar bottles of dried serum diluted to 50 c cm , referred to as concentrated serum , the protein concentration was between 25 6 and 33 4% (3) Serum saline (Clegg and Dible 1940) was used in five experiments

Recording of results —The time scale in the graphs of hæmoglobin percentages is arbitrary, since initial changes are rapid and thereafter slower , the same time scale has been used throughout The control hæmoglobin value in each experiment has been designated 0, and changes therefrom minus or plus percentages of hæmoglobin The actual hæmoglobin value of each graph is given in the legend In experiments performed after venesection, zero represents the hæmoglobin percentage directly after venesection

RESULTS

Stable blood-volume , serum injected —Hæmoglobin percentages are shown in fig 1 In many subjects, initial dilution was considerable, but in none was it sustained, and over minutes or hours the concentration of hæmoglobin tended to return to the initial level When the initial dilution was great, there was evidence of acute overloading of the circulation the venous pressure became elevated, the vital capacity diminished, the X-ray contour of the heart enlarged, and there were changes in blood-pressure and pulse-rate These measurements will be described in detail elsewhere In subjects 1, 2 3, 4 and 5 initial dilution was small or non-existent, and there was little or no evidence of overloading of the circulation No special feature has been found to distinguish these subjects from the others The experiments were not performed in abnormal weather

Fig 1

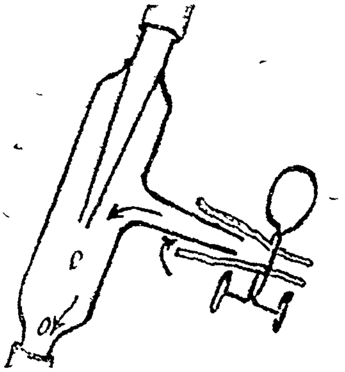


Subject	Sex and age (yr)	Weight (lb)	Initial Hb (%)	Serum injected (c cm)	Duration of injection (min)
1	M 21	123	88	1000	13
2	M 27	135	100	1000	20
3	M 57	165	110	700	7
4	M 30	145	85	1700	17
5	M 42	151	103 2	800	27
6	M 59	150	95	2100	16
7	M 17	171	102 3	1600	14
8	M 42	126	64 5	1620	20
9	M 49		100 2	1250	20
10	M 55	161	100 2	1350	22
11	M 50	115	104	2000	24
12	M 31	150	68 5	1200	13
13	M 18	120	105 3	1200	18

---

* Working for the Medical Research Council

Fig 2

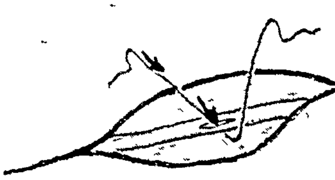


that the spring clamped rubber tube on the drip was perished, stretched and so slack that it could be shaken to and fro on the lateral glass tube to which it was fitted There was an unsatisfactory union which was clearly slack enough to afford an entry for air (fig 2) As this defect must have been present from the beginning of the administration a process of slow air embolism had almost certainly been going on over the whole period of 3¾ hours No other defect was found

CASE 3 —A woman, aged 36, began a long and difficult labour during the night of Jan 10 At 3 20 P M on Jan 12 there were signs of fœtal distress and induction was attempted under anæsthesia From 4 P M to 4 35 P M two applications of forceps were made without success owing to disproportion, and at 4 50 P M the condition became grave owing to collapse with signs of heart failure and pulmonary œdema Nikethamide was given and the left arm was prepared for intravenous saline The skin was incised and an aneurysm needle was passed, as it was thought, behind the median basilic vein A catgut ligature was inserted in its place in order to retain the infusion cannula and close the vein afterwards As deceased's condition suddenly deteriorated, this procedure was abandoned while further restoratives were injected elsewhere A pad of gauze was placed over the exposed vein and light strapping was applied to hold it in place The application was quite loose The woman's general condition deteriorated steadily and she died undelivered at 7 P M

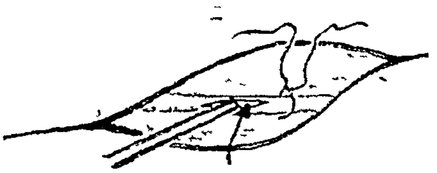
At autopsy it was found that the catgut ligature which lay loose under the gauze passed straight through the vein instead of behind it (fig 3) It could still be drawn to and fro in the double opening through which the aneurysm needle had inadvertently been inserted From this point a thin chain of air bubbles led through the left arm to the superior vena cava, the heart and the main pulmonary arteries Stray bubbles were also seen in both the coronary and the cerebral arteries A condition of air embolism had clearly been developing between about 5 P M when the ligature was passed through the vein and 7 P M when death took place It was remarked that the woman's colour had remained good, and that no bleeding had taken place from the vein in question, but this was of course to be expected under the conditions found Supplementary oxygenation of the venous blood was in progress during these two hours, and the entry of air would effectively prevent bleeding This indeed is a common surgical observation in cases of air-embolism following the accidental incision of veins

Fig 3



CASE 4 —A woman, aged 25, was admitted for hæmorrhage following an incomplete abortion Two further losses of blood occurred in hospital and instrumental removal of retained products was effected between 9 15 and 9 43 A M on the second day after admission The general condition became very poor towards the end of the operation and a pint of plasma was transfused through the right arm at 9 35 A M A further pint of whole blood was given through the same arm at 10 35 A M, and at 12 20 P M a third pint, this time of plasma, was given into the left arm Remarkably little improvement followed, and at about 5 55 P M the left arm veins were exposed by cutting down, and an opening made with some difficulty into a rather collapsed basilic vein Further difficulty was experienced in ing the cannula into the opening made into the vein, 3 or 4 minutes later this was successfully completed collapse and death followed within a few seconds of this

Fig 4



Autopsy revealed a thin trail of frothed blood in collapsed arm vein, and considerably more blood frothed coloured bright crimson filling the pulmonary arteries (in distinction against the dark "venous" blood in veins) The assistant responsible for the transfusion that he had had unusual difficulty in making an entry the left arm vein, and even more difficulty in introducing cannula, and that it might be possible for some volume of to have escaped into the vein during the manipulations (fig

DISCUSSION

It remains only to discuss the precise cause of dea This is bound up closely with the illness of the patie Although a surprisingly large volume of air can tolerated by a healthy subject, a few cubic centimet only may precipitate the death of a person who is alrea gravely ill. Case 4 illustrates this very well, and many of the 56 cases included in my list the *total* quant of air cannot have exceeded 10–15 c cm

Richardson (1937) has shown that the lethal volume inversely related to the speed at which the air is int duced In practice cases of massive air-embolism l case 1 die with the entire lung bed packed with air loc on such a vast scale that a fatal degree of cyanosis a anoxia quickly ensues Where, on the contrary, t entry of air is slow as in cases 2 and 3 the reserve of t lung bed is not taxed, and time is afforded for air bubbl to pass to the left side of the heart whence they m become lodged in the more vital coronary and cereb vessels I have seen such emboli strikingly promine in a case of homicidal stabbing where slow entry occurr through the mastoid branch of the external jugular vei and it was present also in cases 2 and 3 Moore a others (1940) demonstrated the occurrence of fat coronary and cerebral emboli after the experiment introduction of air into the pulmonary vein, and retin scopy has shown their existence in the eye (Reyer a Kohl 1926) In an article on air-embolism I have prev ously recorded a case of "crossed paralysis" lasting f 18 hours in the subject of an empyema irrigati (Simpson 1935) It is unfortunate that one is not ab to demonstrate these emboli by histological techniq as one can in cases of fat-embolism

Certain physical properties which apply to both ma it almost certain that the cause of death in the relative slow air-embolisms in which no massive blocking of t capillary bed of the lung occurs is exactly the same as fat-embolism—the fatally prolonged blocking of t capillary supply of blood to the heart or to the vit centres of the brain Both forms of emboli can ma their way through the capillary bed of the lung, whe speed is not an important factor, but the same slo filtration of emboli through the capillaries of the hea or the brain result in a vital interference with circulati to parts which cannot long survive without it Wils and Ries (1923) have shown that with certain colloid solutions the surface films of the foam behave as gel-li plastic solids rather than viscous liquids As a resu the superficial viscosity may be more than 1000 tim that of water This might well result in such a retard tion of the circulation of air-emboli through the capillari of the heart or the brain as would precipitate the functional failure

I have to thank Mr Douglas Cowburn, late coroner for t southern district of London, and Mr W. R H Heddy, M Neville Stafford, and Mr Hervey Wyatt, coroners for t eastern, western, and southern districts of London, for permi sion to use the records of the 4 cases described

REFERENCES

Chase, W H (1934) *Surg Gynec Obstet* 59, 569
Harkim, H N and Harmon, P H (1934) *Proc Soc exp Biol N* 32, 178
Moore, R M and Braselton C W (1940) *Ann Surg* 112, 212
Reyer, G W and Kohl, H W (1926) *J Amer med Ass* 87, 162
Richardson, H F, Coles, B C and Hall, G E (1937) *Canad me Ass J* 36 584
Simpson K (1935) *Guy's Hosp Gaz* 49 68
Wilson, R E and Ries, E D (1923) Colloid symposium monograp University of Wisconsin, p 145
Wolffe, J B and Robertson, H F (1935) *Ann intern Med* 9, 16

comparison, too, with the results of saline injection after venesection shows that it is the injected serum which is sponsible for sustained dilution

Less is known of the effects to be expected from acute crease in the blood-volume, such as may occur when a rge injection of serum is given rapidly to a normal erson In clinical medicine a blood-volume greater an normal is found only in exceptional circumstances ch as polycythæmia, overdosage with desoxycorticosterone acetate (Ferrebee et al 1939), and possibly ngestive heart-failure (Wollheim 1929), arteriovenous unts (Holman 1940) and over-dilution following emorrhage (Ebert, Stead and Gibson 1941, Wallace d Sharpey-Schafer 1941) In all these, the increase is latively slow It is not surprising, in acute experiments, that the physiological mechanisms of a normal an are directed against any lengthy endurance of a used blood-volume with such sequels as high venous ressure, diminished vital capacity, enlarged heart, &c hough there is a considerable individual variation in me, it appears that the blood-volume tends to return the original lower level by a loss of excess fluid from he circulation Our results in man, therefore, confirm xperiments in the dog and cat, though in the cat limination of injected serum appears to be very rapid Florey and Jennings 1941)

Experiments in which there is no fall of hæmoglobin nd no change in plasma proteins after the injection of arge quantities of concentrated serum allow of two xplanations, provided it is accepted that hæmoglobin igures are not altered by processes such as the sweeping nto the circulation of large stores of corpuscles · either arge quantities of protein leave the blood-stream in a ew minutes, or else a natural flow of proteins into the blood stream is suddenly stopped The latter seems mprobable, since in some experiments it would mean a natural flow of some 80 g of protein in ten minutes, and observations on hæmodilution and plasma-protein levels after hæmorrhage do not suggest that the human body is capable of such a rate of production (Wallace and Sharpey-Schafer 1941) The constant level shown by the plasma proteins in these experiments, and in dilution following hæmorrhage, is further evidence in favour of the view put forward by Madden and Whipple (1940) that plasma protein "is part of a balanced system of body proteins A steady state or ebb and flow exists between it and a portion of the cell and tissue body protein"

The occurrence of transient weal formation in a few experiments suggests that loss of fluid may occur generally in the tissues Further work, however, is necessary on the eventual fate of "lost" protein It does not appear in the urine, and a few preliminary observations indicate that there is no increased nitrogen excretion in the days following the injection of large amounts Daft, Robscheit-Robbins and Whipple (1938), in similar experiments on dogs, showed that large doses of protein could be injected for many days before "protein intoxication" and increase in urinary nitrogen appeared A total dose of 700 g or more of protein would be required in man, if the response was similar to the dog

SUMMARY

The degree of retention of injected serum has been followed by serial hæmoglobin determinations in subjects with stable and acutely reduced blood-volumes

When the blood-volume is stable, serum tends to leave the circulation, and, though in many subjects it is retained longer than an equal quantity of saline, in a few it is lost with great rapidity

Concentrated serum behaves in a similar manner, and since no change in plasma proteins was detected there is evidence in some experiments that protein left the circulation rapidly

When the blood-volume is acutely reduced by a large venesection, serum injected immediately is retained in the circulation Saline is not retained under the same circumstances

It is suggested that mechanisms in man dealing with injected protein solutions are directed towards attaining the previous stable blood-volume

This work was carried out with the aid of an expenses grant from the Medical Research Council, and with the

Continued at foot of next column

Continued from previous column

coöperation of Dr Janet Vaughan, who kindly supplied the dried serum Plasma protein estimations were made in the school laboratories (director, Dr E J King)

REFERENCES

Clegg, J W and Dible, J H (1940) *Lancet* ii 294
Daft, F S, Robscheit Robbins, F S and Whipple, G H (1938) *J biol Chem* 123, 87
Ebert, R V and Stead, E A (1941) *Amer J med Sci* 201, 655
— — and Gibson, J G (1941) *Arch intern Med* 68, 578
Ferrebee, J W, Ragan, C Atchley, D W and Loeb, R F (1939) *J Amer med Ass* 113, 1725
Florey, H W and Jennings, M A (1941) Personal communication
Freeman, N E and Wallace, W M (1938) *Amer J Physiol* 124, 791
Gilligan, D R, Altschule, M D and Volk, M C (1938) *J clin Invest* 17 7
Hahn, P F, Ross J F, Bale W F, Balfour, W M and Whipple, G H (1942) *J exp Med* 75, 221
Hayward G W (1942) *Brit med J* i, 285
Hill, D K, McMichael, J and Sharpey Schafer, E P (1940) *Lancet* ii 774
Hill, D K and Pincock, A C (1941) *Ibid*, ii 754
Holman, E (1940) *Trans Amer surg Ass* 58, 360
King E J, Haslewood, G A D and Delory, G E (1937) *Lancet* i 886
Madden, S C and Whipple G H (1940) *Physiol Rev* 20, 194
Marriott, H L and Kekwick, A (1940) *Brit med J* i, 1043
Robertson J D (1935) *J Physiol* 84, 393 (1938) *J exp Path* 19, 30
Wallace, J and Sharpey Schafer E P (1941) *Lancet*, ii 393
Wollheim, E. (1929) *Verh dtsch Ges inn Med* 41, 352

CARCINOMA OF THE MALE BREAST

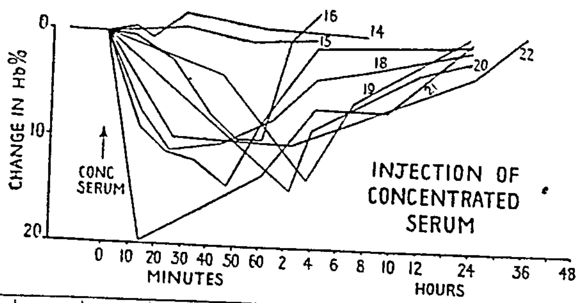
I. G WILLIAMS, M B LOND, F R C S, D M R E
ASSISTANT RADIOTHERAPIST TO THE MIDDLESEX HOSPITAL, LATE SURGEON TO THE EMS

CARCINOMA of the male breast is uncommon In the decade 1931–40, 18 cases were referred to the Middlesex Hospital and in addition 2 cases were seen at the Mount Vernon EMS Hospital, making 20 cases for study During the same period 1573 cases of carcinoma of the female breast were seen—an incidence ratio of 1 to 88, which corresponds with the ratio of 1 to 90 recorded by the Registrar-General in his report for 1936 In our experience at these hospitals benign conditions of the male breast are much more common than malignant disease During the same years 41 cases of chronic mastitis and 5 cases of benign tumours, mainly fibroadenomata, were seen in men Symptoms and signs were sufficiently severe in all these cases to warrant surgical treatment and all were confirmed histologically (Scarff and Smith 1942)

There were no men in the series below 30 years of age, the youngest being 33 Above this there was a gradually increasing incidence reaching a maximum of 7 in the decade 60–70 years, the oldest was aged 71 The complete distribution was aged 30–39, 3, 40–49, 3, 50–59, 5, 60–69, 7, 70–79, 2 The average age at operation was 55 years Carcinoma of the breast tends to occur slightly later in life in men than in women

Information was not available in all cases, but there did not seem to be any specially suggestive family history of cancer The right breast was affected in 12 cases, the left in 8 The average duration of symptoms before consultation was 14 months, the average in those patients who are still alive being 20 months, and in those who have died 8 months Among those alive 3 gave a history of a lump in the breast for 7 years, 6 years and 5 years respectively, and 1 of the patients who died said he had had a lump in the breast for over 8 years Some authorities (Sachs 1941) have suggested that the primary condition in these patients with long histories is a benign condition preceding the malignant disease There is no doubt however that some carcinomata of the male breast grow slowly, and that the tumours are of a low grade of malignancy The tumour-bed in the male is not subject to the same periodic cyclical changes as in the female, neither is it affected by lactation or the climacteric The patient with the 7 years history had refused treatment 18 months before when a clinically recognisable carcinoma was present He agreed to a radical operation when the growth ulcerated through the skin, but even at this time the axillary lymph-nodes, though clinically enlarged, were microscopically free from growth The primary tumour was a spheroidal-cell carcinoma, grade 1 He remains well 62 months later The ages of the 3 patients with long histories were

Fig 2



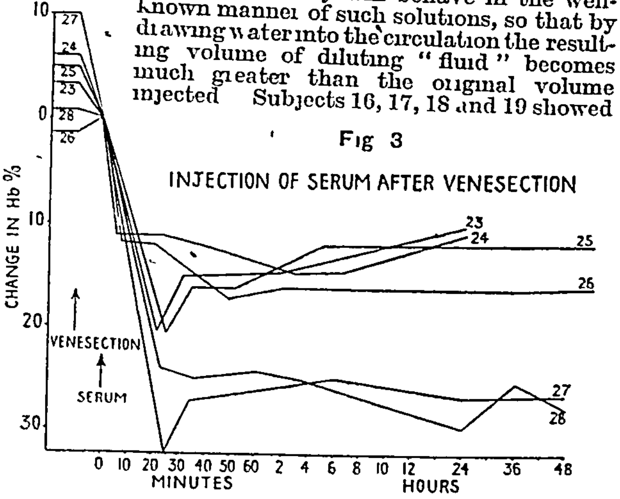
Subject	Sex and age (yr)	Weight (lb)	Initial Hb (%)	Amount injected (c cm)	Duration of injection (min)	Plasma proteins (%)		Immediate Hb % change
						Before injection	Directly after injection	
14	M 30		78	300	12			+ 0 3
15	M 35	153	97	300	12	7 2	7 3	0
16	M 59	143	81 2	300	10	8 4	8 5	− 0 4
17	M 40	131	66 6	200	16	6 6	6 7	− 9
18	M 17	170	93 2	300	14	6 5	6 6	− 7
19	M 55	123	70 5	520	45	7 7	7 8	− 3 8
20	M 48	159	60	615	60	6 3	6 3	− 13 5
21	M 21	137	95	300	13	8	8	− 20
22	M 55	123	71 6	300	16			− 9 7

conditions, when some change in water balance might be expected

Transient generalised weal formation was seen in the skin on four occasions (subjects 2, 6, 9, 10) It appeared towards the end of, or a few minutes after, injection This phenomenon has been noticed in dogs after the injection of serum (Freeman and Wallace 1938)

Stable blood-volume, concentrated serum injected —Results (fig 2) are similar to those found with serum, thus in some experiments there is initial dilution and loss of diluting fluid over the next twenty-four hours, in others little or no initial dilution occurs Initial dilution in some experiments is greater than would be produced theoretically by the addition to the circulation of the amount of "fluid" injected Concentrated serum solutions are of course also hypertonic salt solutions, and it is to be expected that they will behave in the well-known manner of such solutions, so that by drawing water into the circulation the resulting volume of diluting "fluid" becomes much greater than the original volume injected Subjects 16, 17, 18 and 19 showed a progressive fall of hæmoglobin to levels lower than initial fall Plasma proteins showed no change after injection

Fig 3



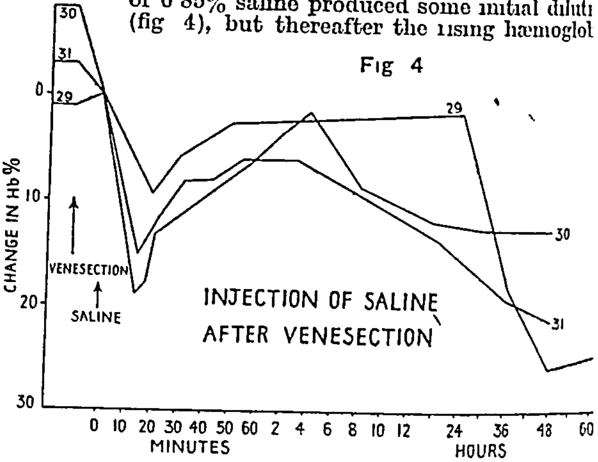
Subject	Sex and age (yr)	Weight (lb)	Initial Hb (%)	Amount of venesection (c cm)	Duration of venesection (min)	Serum (c cm)	Duration of serum injection
23	M 32	129	88	00	14	1200	20
24	M 57	165	106 3	720	8	700	5
25	M 59	151	84	1050	19	2100	25
26	M 59	143	83	1080	16	300*	7
27	I 53	107	95	900	7	1300	23
28	M 50	115	95	1100	12	2100	25

* Concentrated serum

Reduced blood-volume, serum injected —Results (fig indicate that serum injection given immediately after large venesection produced immediate dilution which maintained Observations 6 and 25, 11 and 28, 3 and 16 and 26 were made on the same subjects, the and rate of injection were the same when the volume was stable and when it was reduced was no evidence of overloading of the circulation when these doses of serum were given after venesection The venous pressure, which on bleeding showed either a fall or no change, did not rise above the control level injecting serum, three subjects who showed a fall blood-pressure and fainting after venesection w rapidly restored by the serum injection

Reduced blood-volume, saline injected —In compar with serum injection after venesection, similar quantit of 0 85% saline produced some initial diluti (fig 4), but thereafter the rising hæmoglob concentration indicates a loss from the circulation, and it was not until twenty-four hours or more that the normal process of dilution after hæmorrhage again produced a fall in hæmoglobin percentage Plasma proteins fell immediately after saline injection, as has been shown by Gilligan, Altschule and Volk (1938)

Fig 4



Subject	Sex and age (yr)	Weight (lb)	Initial Hb (%)	Amount of venesection (c cm)	Duration of venesection (min)	Saline (c cm)	Duration of injection (min)	Plasma proteins (%)	
								Before saline	Directly after saline
29	M 57	162	106	1000	14	1500	21	7 9	6 4
30	M 37	119	102	720	21	1800	13	7 7	7
31	M 38	152	108	900	10	1650	14	6 5	5 8

DISCUSSION

The results of this work show two main features the degree of retention in the circulation of injected serum depended on whether the blood-volume was stable or reduced, no significant change in plasma proteins was detected after injection of concentrated serum, although in some subjects there was little or no change in hæmoglobin percentage

It must be pointed out that in these experiments the reduction of blood-volume is acute, and there is no implication that the same results will be obtained in states where the blood-volume is chronically reduced and perhaps stabilised at a lower level The retention of serum after a large venesection agrees with the results obtained in casualties suffering from acute blood loss (Hill et al 1941) The possibility that the immediate sustained fall in hæmoglobin represents a natural process of dilution after venesection may be rejected, since in 28 similar subjects no such immediate fall has been seen after simple venesection of the same amount of blood (Wallace and Sharpey-Schafer 1941), an observation confirmed by Ebert, Stead and Gibson (1941) A changes, primary tumours and axillary lymph-nodes became much smaller and more mobile, and skin recurrences regressed completely One case in stage 3 which received adequate and immediate postoperative X-ray therapy lived 18 months longer than any other case in the same stage, and 25 months longer than the average survival for this stage In spite of extensive axillary involvement found at operation he remained well for 3 years and died from widespread blood-stream metastases, without developing any local recurrence within the irradiated area

ABLE II—CLINICAL STAGE, HISTOLOGICAL GRADE, TREATMENT AND RESULTS IN 10 CASES

Treatment	Case no	Stage 1	Stage 2	Stage 3	Grade 1	Grade 2	Grade 3	Result
imple excision and immediate radiotherapy *	1	+			+			A
	2	+			+			A
	3	+				+		A
	4	+				+		A
	5		+			+		A
Radical mastectomy	6	+			+			A
	7		+		+			A
adical mastectomy with immediate radiotherapy	8		+				+	D
	9		+				+	D
	10			+	+			D

* Immediate radiotherapy = treatment during the period of perative treatment, excluding later radiotherapy for metastasis = alive, D = dead

The similarity in the histological picture of male and emale breast cancers and our knowledge of the effects of adiotherapy in the female tumours, together with the act that half this small series of cases were of high-grade malignancy is an argument for full use of radiotherapy n combating this disease

The impression left is that the prognosis of male breast carcinoma is good when the tumour is still confined to the breast tissue, in any stage beyond this the prognosis is very poor The tumour should be more readily detected in the male than in the female breast because it forms an obvious mass In this series the fault of delayed treatment lay with the patient, for every case had been immediately referred by his private doctor for expert opinion The following plan of treatment is suggested .

1 All cases should receive radiotherapy, preferably given before operation

2 Simple mastectomy, together with radiotherapy, is sufficient in stage 1

3 Radical mastectomy without preliminary radiotherapy should be reserved for stage 2 cases provided that primary and immediate union of the wound is assured If operation entails too wide a sacrifice of skin to assure union, and so delays immediate postoperative radiotherapy, then full preoperative radiotherapy should be given

4 Stage 3 cases should be treated by radiotherapy alone

SUMMARY

A series of 20 cases of carcinoma of the male breast are recorded , 9 died and of the surviving 11, 7 have lived an average of 48 4 months since treatment

Symptoms included a lump in the breast in 20 , discharge from the nipple in 6 , retraction of the nipple in 5 , pain in the breast in 4 , ulceration in 5

The cases have been classified according to clinical stages and histological grades Analysis of results in 10 cases shows that 5 patients in stage 1, with tumours of either grade 1 or grade 2, survived , of 4 patients in stage 2, one with a grade 1 and one with a grade 2 tumour survived, but 2 with grade 3 tumours died , one patient in stage 3 with a grade 1 tumour also died Thus both the degree of malignancy and the extent of anatomical spread have a bearing on survival

A scheme of treatment, based on the clinical stage of the illness, is suggested

Most of these cases were under the care of members of the honorary surgical staff of the Middlesex Hospital, to whom my thanks are due for allowing me to study them I also wish to thank Dr R W Scarff and Dr C P Smith for their assistance in grading the tumours and Mr D H Patey for his help and advice

References at foot of next column

GLANDULAR FEVER WITH GRANULOCYTOPENIA

W GORDON SEARS, M D LOND , M R C P.
MEDICAL SUPERINTENDENT TO MILE END LCC HOSPITAL

DRUGS of the sulphonamide type have been recommended in the treatment of glandular fever, but it should not be forgotten that granulocytopenia may occur in this disease and their use would then be dangerous Granulocytopenia was present in the following case

A nurse, aged 21, was admitted to hospital on Aug 4, 1941, complaining of general malaise and slight swelling of the neck glands for three or four days Temperature 101° F , pulse-rate 96 per min The only abnormalities detected on full clinical examination were slight tender swelling of the glands below the angle of the jaw on both sides and slight redness of the throat The next day a few tender glands were palpable in the right axilla and posterior triangles of the neck At no time during the illness was the spleen palpable , no rash or jaundice developed Three days after admission she complained of sore throat The tonsils were more inflamed and a few blocked crypts were visible During the next few days the tonsillitis increased in severity and patchy exudate was present on both tonsils This condition subsided in about ten days The temperature was about 101° F for ten days, and on one occasion reached 104° F There was one rigor The pulse rate varied between 100 and 120 until the fever began to subside Blood-counts (see table) on Aug 5, 6 and 7 showed anæmia with granulocytopenia, and after that pentose nucleotide was given intramuscularly 10 c cm t d s on the first day, 10 c cm b d on the second day, and 15 c cm on the third day (total 80 c cm) Iron was also given for the anæmia and continued for several months On Aug 6 the Paul-Bunnell test was positive up to dilutions of 1 in 300 and by Aug 16 the titre had risen to 1 in 500, falling to 1 in 250 on Aug 20 The blood Wassermann and Kahn tests were negative

BLOOD COUNTS

Date	Red cells per c mm (millions)	Hb %	White cells per c mm	Polymorphs %	Polymorphs per c mm	Lymphocytes %	Lymphocytes per c mm	Monocytes %	Monocytes per c mm	Eosinophils %
1941										
Aug 5	3,350	59	8500	3	255	95	8075	1	85	1
,, 9	3,410	61	7000	5 5	385	89	6230	5 5	385	0
,, 13			6160	12	739	86	5298	2	123	0
,, 16	3,500	63	5400	20	1080	75	4050	3	162	2
20			5300	40	2120	51	2703	8	424	1
Nov 1	4,800	75	4800	43	2064	50	2400	5	240	2
1942										
Jan 2	4,400	80	5800	60	3480	30	1740	8	464	2

In the earlier blood-counts, the red cells showed slight anisocytosis, poikilocytosis and polychromasia which gradually improved Considerable numbers of atypical mononuclear cells were classified under the heading of lymphocytes

DISCUSSION

The granulocytopenia evident in the early blood-counts gave cause for anxiety but after the injections of pentose nucleotide there was steady improvement and the patient eventually recovered completely Although the clinical features suggested glandular fever, the possibility of the case being one of aleukæmic leukæmia arose during the first day or two The diagnosis was confirmed by the Paul-Bunnell test and the subsequent progress of the case At no time either before or during the course of the disease were any drugs taken which are known to be responsible for granulocytopenia Sulphonamides would clearly have been dangerous in this case It follows, therefore, that any case of glandular fever in which chemotherapy is contemplated must be carefully controlled by blood-counts before and during its administration

I wish to thank the medical officer of health of the London County Council for permission to publish the case

---

MR WILLIAMS   REFERENCES

Ewing J (1928) Neoplastic Diseases Philadelphia
Handley W S (1914) *Practitioner* 92, 788
Patey, D H and Scarff R W (1928) *Lancet*, i, 801
achs M D (1941) *Radiology*, 37, 458
carff, R W and Smith, C P (1942) *Brit J Surg* In press

75 53 and 36 years One case in the series progressed extremely rapidly; the history went back less than 6 months, and he died within 6 months of operation

The effect of trauma to a normal breast as an ætiological factor in the development of a new growth has not been established although it has been conceded by some authorities that repeated or persistent injury may give rise to neoplastic change (Handley 1914, Ewing 1928) In our series 3 patients who were regular soldiers gave a history of an injury to the breast many years previously A fourth case, a sailor, was hit on the breast by a derrick There was considerable bruising and six weeks later he discovered the tumour at the exact site of the injury. On examination at this time the growth was inoperable, and hard, enlarged lymph-nodes were present in the axilla and supraclavicular regions In spite of intensive radiotherapy, and good response within the treated area, widespread dissemination occurred and he died within a year No conclusions can be drawn from this case but three possibilities are open for consideration · the injury was responsible entirely for the origin of a highly malignant new growth, or a slow-growing tumour was activated and its growth stimulated by the injury and its results, or the tumour was entirely independent of the injury

SIGNS AND SYMPTOMS

All the patients complained of a lump in the breast and in all cases this was in intimate relationship to the areola and the nipple In most the nipple was centrally placed, in others the growth extended into a quadrant of the breast most commonly into the upper part The size varied, the maximum recorded being 5 cm in diameter and the average 2–3 cm The consistence was hard or very hard, and in all cases the tumour was attached to the skin In 5 cases ulceration had occurred at the nipple producing an appearance similar to that of Paget's disease With slower growing tumours distortion had produced such signs as retraction and elevation of the nipple Discharge from the nipple was present in 6 cases, in 2 it was a pale yellow serous secretion which dried forming a crust and in the remainder it was blood-stained Pain in the breast was not a common symptom

Clinical classification in stages, as in female breast cancer, was possible with one exception in this series there were no examples of the mobile tumour in the breast substance, not attached either to skin or fascia—however small the primary growth, it was infiltrating the skin and attached to it In 9 cases with clinically involved axillary lymph-nodes microscopical examination of the nodes after radical mastectomy revealed growth in only 6 cases Numbers in each clinical stage were stage 1 (operable), 6 cases, stage 2 (borderline operability), 6 cases, stage 3 (inoperable), 8 cases

TABLE I—AVERAGE DURATION OF SYMPTOMS, DURATION OF FOLLOW-UP, STAGE AND GRADE, IN 16 CASES

Clinical stage	No of cases	Histological grade			Duration in months of		Result
		1	2	3	sympt	follow up	
1	5	2	2	1	10	55	5 (a)
2	5	4	0	1	9	30	2 (a) 3 (d)
3	6	1	0	4	8	21	6 (d)

(a) = alive, (d) = dead

The average length of life from the first onset of symptoms until death in those who died, was 31 months, the shortest time being 6 months and the longest 42 months (table I) All the fatal cases died with widespread metastases, similar in distribution to those seen in fatal cases of carcinoma of the female breast In 9 fatal cases the distribution of metastases was · skin and skin-flaps, 7, supraclavicular glands, 6, lungs, 7, abdomen, 5, spine, 6, skull, clavicle, humerus, sternum, pelvis and femur, 1 each brain, 1 Thus the skin, lymph-nodes, bones and lungs were most commonly involved, and of the bones the spine was most often affected Statistics and facts were compiled from clinical, radiological and post-mortem evidence In bone the metastases were all of the osteolytic type, and in one case pain, local and referred, preceded radiological evidence of bone destruction by 3 months In the first year after patient died, in the second 5 in the third 2, and fourth 1

PATHOLOGY AND TREATMENT

Pathological material from operated or post-tissue was available for study in 16 cases histologically, male and female breast cancer are similar, the commonest type being adenocarc carcinoma simplex and colloid carcinoma or gel carcinoma also occur All cases in this serie spheroidal-cell carcinomata. In some there was formation, and in 2 cases there were colloid change stroma, these 2 were treated by radical mastecton although the axillary lymph-nodes were free of gr both, one remains free of recurrence 6 years late the other died with extensive metastases 3 year operation The tumours were examined and gra Dr R W Scarff and Dr C P Smith, of the Bland-Institute of Pathology at the Middlesex H according to the description and rules proposed by and Scarff (1928) The frequency in each grade was grade 1, 7 cases, grade 2, 3 cases, grade 3 (high nancy), 6 cases The average length of history in grade 1 histological type was 12 5 months, and in grade 7 2 *months Of 10 cases in clinical stages 1 and* 8 were also grade 1 or 2 histologically, of 6 cases in clinical stage 3, 4 were in grade 3 histologically grade 3 case in clinical stage 1 is alive and well 2 years after treatment, whereas the single case of low malignancy in clinical stage 3 died with extensive metastases in the third year after treatment The anaplastic tumours become clinically more widespread faster than the lower grades, and both factors—histological type and anatomical spread—affect the prognosis

Surgical treatment, with or without the addition of radiotherapy, was given to 18 of the 20 patients in the series Although 6 cases were in stage 3, only 2 were considered to be too advanced for surgery and were treated by radiotherapy alone, 6 cases were treated by simple mastectomy with pre- or post-operative radiotherapy, 6 were treated by radical mastectomy alone, 4 of these receiving radiotherapy later for metastases or recurrences The remaining 6 cases were treated by radical mastectomy with radiotherapy given postoperatively when the wound healed; in 1 case this was four months later

RESULTS

Excluding 4 cases seen in the last 15 months, 7 of this series are alive and 9 are dead The average follow-up in those alive is 48 4 months, while in those dead it is 21 7 months Of 5 cases treated in clinical stage 1 all are alive and free of disease for periods of 80, 80, 57, 36 and 24 months, 2 out of 5 cases in stage 2 are alive 62 and 17 months after treatment (table II). All 6 cases in stage 3 are dead, the longest survival being 40 months and the shortest 6 months Of the stage 1 cases so far successful, 1 had a radical mastectomy and 4 a simple mastectomy together with deep X-ray therapy given preoperatively in one and postoperatively in 3 cases. Of the 2 successful cases in stage 2, one was treated by radical mastectomy and the other by simple mastectomy together with pre- and post-operative radiotherapy Of the 9 fatal cases 6 were treated by radical mastectomy and received radiotherapy later when the wound was healed These few cases thus give the impression that the most important factor in prognosis is the anatomical extent of the disease In early cases local operation together with radiotherapy is as efficacious as more radical surgery, while in the more advanced stages the only possible treatment is palliation All our stage 3 cases were treated by radical surgery when both the local condition and the lymph-node metastases had advanced beyond the point at which operation on the female breast would today be considered advisable.

The value of radiotherapy is difficult to assess from the few cases in this series The facts are that 2 of the older and 2 of the more recent cases were given preoperative deep X-ray therapy; in each of the 4 viable cancer cells were found in the material removed at mastectomy, although both stroma and tumour cells showed evidence of radio-active effect In all the pattern of the tumour was recognisable, the primary and recurrent growths that were treated showed definite hnical changes primary tumours and axillary lymph-odes became much smaller and more mobile and skin ecurrences regressed completely. One case in stage 3 hich received adequate and immediate postoperative -ray therapy lived 18 months longer than any other ase in the same stage, and 25 months longer than the verage survival for this stage In spite of extensive xillary involvement found at operation he remained ell for 3 years and died from widespread blood-stream etastases, without developing any local recurrence ithin the irradiated area

ABLE II—CLINICAL STAGE, HISTOLOGICAL GRADE, TREATMENT AND RESULTS IN 10 CASES

Treatment	Case no	Stage 1	Stage 2	Stage 3	Grade 1	Grade 2	Grade 3	Result
imple excision and immediate radiotherapy *	1	+			+			A
	2	+			+			A
	3	+				+		A
	4	+				+		A
	5		+			+		A
Radical mastectomy	6	+			+			A
	7		+		+			A
Radical mastectomy with immediate radiotherapy	8		+				+	D
	9		+				+	D
	10			+	+			D

* Immediate radiotherapy = treatment during the period of perative treatment, excluding later radiotherapy for metastasis
A = alive, D = dead

The similarity in the histological picture of male and female breast cancers and our knowledge of the effects of radiotherapy in the female tumours, together with the fact that half this small series of cases were of high-grade malignancy is an argument for full use of radiotherapy in combating this disease

The impression left is that the prognosis of male breast carcinoma is good when the tumour is still confined to the breast tissue, in any stage beyond this the prognosis is very poor The tumour should be more readily detected in the male than in the female breast because it forms an obvious mass In this series the fault of delayed treatment lay with the patient for every case had been immediately referred by his private doctor for expert opinion. The following plan of treatment is suggested

1 All cases should receive radiotherapy, preferably given before operation

2 Simple mastectomy, together with radiotherapy, is sufficient in stage 1

3 Radical mastectomy without preliminary radiotherapy should be reserved for stage 2 cases provided that primary and immediate union of the wound is assured If operation entails too wide a sacrifice of skin to assure union, and so delays immediate postoperative radiotherapy, then full preoperative radiotherapy should be given

4 Stage 3 cases should be treated by radiotherapy alone

SUMMARY

A series of 20 cases of carcinoma of the male breast are recorded, 9 died and of the surviving 11, 7 have lived an average of 48 4 months since treatment

Symptoms included. a lump in the breast in 20, discharge from the nipple in 6, retraction of the nipple in 5, pain in the breast in 4 · ulceration in 5

The cases have been classified according to clinical stages and histological grades Analysis of results in 10 cases shows that 5 patients in stage 1, with tumours of either grade 1 or grade 2, survived, of 4 patients in stage 2, one with a grade 1 and one with a grade 2 tumour survived, but 2 with grade 3 tumours died, one patient in stage 3 with a grade 1 tumour also died Thus both the degree of malignancy and the extent of anatomical spread have a bearing on survival

A scheme of treatment, based on the clinical stage of the illness, is suggested

Most of these cases were under the care of members of the honorary surgical staff of the Middlesex Hospital, to whom my thanks are due for allowing me to study them I also wish to thank Dr R W Scarff and Dr C P Smith for their assistance in grading the tumours and Mr D H Patey for his help and advice

References at foot of next column

GLANDULAR FEVER WITH GRANULOCYTOPENIA

W GORDON SEARS, M D LOND, M R C P.
MEDICAL SUPERINTENDENT TO MILE END LCC HOSPITAL

DRUGS of the sulphonamide type have been recommended in the treatment of glandular fever, but it should not be forgotten that granulocytopenia may occur in this disease and their use would then be dangerous Granulocytopenia was present in the following case

A nurse, aged 21, was admitted to hospital on Aug 4, 1941, complaining of general malaise and slight swelling of the neck glands for three or four days Temperature 101° F, pulse-rate 96 per min The only abnormalities detected on full clinical examination were slight tender swelling of the glands below the angle of the jaw on both sides and slight redness of the throat The next day a few tender glands were palpable in the right axilla and posterior triangles of the neck At no time during the illness was the spleen palpable, no rash or jaundice developed Three days after admission she complained of sore throat The tonsils were more inflamed and a few blocked crypts were visible During the next few days the tonsillitis increased in severity and patchy exudate was present on both tonsils This condition subsided in about ten days The temperature was about 101° F for ten days, and on one occasion reached 104° F There was one rigor The pulse rate varied between 100 and 120 until the fever began to subside Blood-counts (see table) on Aug 5, 6 and 7 showed anæmia with granulocytopenia, and after that pentose nucleotide was given intramuscularly 10 c cm t d.s on the first day, 10 c cm b d on the second day, and 15 c cm on the third day (total 80 c cm) Iron was also given for the anæmia and continued for several months On Aug 6 the Paul-Bunnell test was positive up to dilutions of 1 in 300 and by Aug 16 the titre had risen to 1 in 500, falling to 1 in 250 on Aug 20 The blood Wassermann and Kahn tests were negative

BLOOD-COUNTS

Date	Red cells per c mm (millions)	Hb %	White cells per c.mm.	Polymorphs %	Polymorphs per c.mm	Lymphocytes %	Lymphocytes per c.mm	Monocytes %	Monocytes per c mm	Eosinophils %
1941 Aug 5	3,350	59	8500	3	255	95	8075	1	85	1
„ 9	3,410	61	7000	5 5	385	89	6230	5 5	385	0
„ 13			6160	12	739	86	5298	2	123	0
„ 16	3,500	63	5400	20	1080	75	4050	3	162	2
20			5300	40	2120	51	2703	8	424	1
Nov 1	4,800	75	4800	43	2064	50	2400	5	240	2
1942 Jan 2	4 400	80	5800	60	3480	30	1740	8	464	2

In the earlier blood-counts, the red cells showed slight anisocytosis, poikilocytosis and polychromasia which gradually improved Considerable numbers of atypical mononuclear cells were classified under the heading of lymphocytes

DISCUSSION

The granulocytopenia evident in the early blood-counts gave cause for anxiety but after the injections of pentose nucleotide there was steady improvement and the patient eventually recovered completely Although the clinical features suggested glandular fever, the possibility of the case being one of aleukæmic leukæmia arose during the first day or two The diagnosis was confirmed by the Paul-Bunnell test and the subsequent progress of the case At no time either before or during the course of the disease were any drugs taken which are known to be responsible for granulocytopenia Sulphonamides would clearly have been dangerous in this case. It follows, therefore, that any case of glandular fever in which chemotherapy is contemplated must be carefully controlled by blood-counts before and during its administration

I wish to thank the medical officer of health of the London County Council for permission to publish the case

---

MR WILLIAMS · REFERENCES

Ewing J (1928) Neoplastic Diseases Philadelphia
Handley W S (1914) *Practitioner* 92, 788
Patey D H and Scarff R. W (1928) *Lancet*, i, 801
Sachs M D (1941) *Radiology*, 37 458
Scarff, R. W and Smith, C P (1942) *Brit J Surg* In press

EXCRETION OF SULPHAGUANIDINE IN FÆCES

FRANK HAWKING, D M OXFD
(*National Institute for Medical Research*)

WHEN sulphaguanidine is given by mouth, a high concentration of the compound occurs in the fæces It is generally assumed that this is due to deficient absorption of the substance in the alimentary canal, and no account is taken of the possibility that it might result from re-excretion of the compound into the fæces, either by the bile or through the intestinal walls. However, the only actual evidence seen to date in support of the explanation by deficient absorption is the finding of Hubbard, Butsch and Aaron[1] that in two patients with biliary fistulæ who received sulphaguanidine by mouth the concentration in the bile was low compared with that of the blood On the other hand, Keyser[2] found that when 'Albucid' or other sulphonamides were injected intravenously into man considerable quantities were excreted in the fæces, and it is known that when sodium sulphapyridine is injected intravenously appreciable amounts may be detected in the stomach contents of patients who vomit

Experiments have recently been performed to investigate this question A cat was anæsthetised, sutures were passed round the anus and urethra, and 3 g of sulphaguanidine was spread subcutaneously over a wide area, the incision being afterwards tightly sutured Twenty-four hours later the animal was killed, and the concentration of sulphaguanidine in the various organs was estimated by Marshall's method In two typical experiments, with cats weighing about 3 kg, the average concentrations (mg per 100 c cm) of free and of total sulphaguanidine respectively were as follows

Contents of colon, 17 and 20, contents of ileum, 17 and 21; bile, 8 7 and 9 8, liver 9 3 and 10 8, kidney, 17 and 21, urine 1180 and 2150 (absolute amounts present in distended bladder, 1 0 and 1 9 g), spleen, 9 0 and 10 2, skeletal muscle, 8 3 and 9 0, blood, 6 hours after implantation of drug, 8 0 and 10 3, blood at death, 24 hours after implantation, 11 0 and 12 8

When the animals were killed, much compound was still visible at the site of subcutaneous implantation

These figures provide evidence that sulphaguanidine which has been absorbed is excreted almost entirely into the urine, and that the amount which passes from the blood into the lumen of the intestines is negligible

MIGRATION OF A FOREIGN BODY IN THE ABDOMEN

J N MACBEAN ROSS
M C, M D EDIN., F R C S E
SENIOR SURGEON TO SUTTON AND CHEAM GENERAL HOSPITAL

P D MCLELLAN
M B CAMB
FORMERLY RESIDENT MEDICAL OFFICER TO THE HOSPITAL

A WOMAN of 31, mother of 4 children, was admitted to hospital on Oct 31, 1939, with a history of having on the previous evening inserted a piece of slippery elm (*Ulmus fulva*) into her vagina in the hope of inducing an abortion—a method first described by Soranus of Ephesus towards the end of the first century

Her pulse rate was 132 per min, temperature 102° F, and respirations 28 She was somewhat collapsed and complained of pain in the lower abdomen, but there was no tenderness and no muscular rigidity Vaginal examination revealed a slightly enlarged uterus, the os just admitted a forefinger and no recent laceration of either cervix or vagina could be felt A general anæsthetic was given and she was again examined, nothing further being found or seen the cervix was dilated and the uterine cavity explored No foreign body was discovered and no fœtus felt No perforation of the uterus could be found but the exploring finger could not quite reach the summit of the fundus Next day general peritonitis was present and immediate operation was essential Free pus and blood was present in the peritoneal cavity At the highest point of the fundus uteri a perforation ¼ in in diameter was found This was closed and reinforced by a flap of omentum A rapid search of the peritoneal cavity did not reveal any foreign body, and as the general of the patient was very poor this search was quickly doned and the wound was sown up and drained She then given massive doses of sulphanilamide by mouth injection After a somewhat stormy convalescence she discharged from hospital on the 31st day after operation the wound firmly healed and apparently quite well

On Jan 31, 1940, she was readmitted with a brawny mass about the size of a cricket ball in the left upper quadrant of the epigastrium which she stated had been present for weeks It was quite painless Her temperature was 98° F pulse rate 72, and respirations 20 As no fluctuation was present and her general condition was excellent, 'Kaolin' poultices were applied until Feb 17 when a definite abscess had formed This was opened and about 10 oz of sterile pus was evacuated in which was a piece of wood about 4 in long The wound healed by first intention and she was discharged from hospital on March 3 When seen on June 30 she was perfectly fit and carrying on with her usual household duties

The points of interest in this case are that a woman, who had already had 4 children, should attempt to empty her uterus under the erroneous impression that she was again pregnant, the accuracy with which she inserted the foreign body causing no injury to either the vagina or cervix (a feat which the professional abortionist rarely attains and might well envy), and the remarkable effect of sulphanilamide The foreign body travelled a considerable distance without doing any injury to the bowel, yet it pierced both peritoneum and rectus, forming a sterile abscess from which it was easily extracted Authentic records of foreign bodies, such as pins and needles, travelling through the tissues are rare[1], this case is an example of migration of a rather unusual character which we were able to verify

ANEURYSM OF SPLENIC ARTERY

DEATH FROM HÆMATEMESIS

BERNARD MURPHY, M R C S
ASSISTANT MEDICAL OFFICER AT NEW END HOSPITAL (LCC)

A MAN, aged 66, felt faint while straining at stool, had slight pain in the epigastrium and left shoulder and then vomited a small amount of blood Later the same day he passed several tarry stools and again vomited some blood He gave a history of having had tuberculous cervical glands as a child with a recurrence 2 years ago He had been treated by irradiation at another hospital with considerable improvement and gain in weight He had never had gastric symptoms and was almost a complete abstainer

He was pale and shocked, blood-pressure 97/70 mm Hg, pulse-rate 136 per min There were scars in the right submaxillary region and some matted tuberculous glands Nothing abnormal was found in the abdomen He was given a pint of blood on admission and during the following 5 days his condition gradually improved, but on the morning of the 6th day he suddenly collapsed and became cold and clammy with imperceptible pulse He recovered after a short time and vomited about 3 oz of blood His stools never ceased to be tarry A further transfusion was given but next day he again collapsed and died in a few minutes

At autopsy the stomach was found to be dilated and contained a large blood-clot which formed a complete cast The intestines also contained a considerable quantity of blood A mass about 2 in in diameter was adherent to the pancreas and lesser curvature of the stomach The gastric mucosa over the tumour showed several erosions measuring up to ⅓ in in diameter and containing some old and recent blood-clots On incising the mass extensive hæmorrhage was found into the neck of the pancreas, and there was a smooth-walled sac which appeared to be an aneurysm of the splenic artery which had eroded the stomach wall

The laboratory report on the sac and adnexa was as follows Erosion and perforation of stomach wall by the aneurysmal sac Chronic inflammation of the stomach with an area suggestive of tuberculosis Hæmorrhage and chronic inflammation in the pancreas due to erosion by the wall of the aneurysmal sac Chronic purulent infiltration and fibrosis of the wall of the aneurysm artially organised thrombus in the aneurysmal sac aseous and granulomatous tuberculosis of the mesen-eric lymphatic glands in close relation to the aneurysm uberculous tracheitis Purulent infiltration and ecrosis with foreign-body giant cells in the lymphatic land from the right supraclavicular region

---

[1] *Proc Soc exp Biol* 1941, 47, 132 [2] *Klin Wschr* 1941, 20, 1267

[1] Rogers, L *Lancet*, 1942 1, 309

I am indebted to Dr Raymond Swindells, medical superintendent of New End Hospital, Hampstead, for permission publish this case and to Dr A B Bratton for the report on e pathology

---

Medical Societies

ROYAL SOCIETY OF MEDICINE

At a meeting of the section of Neurology on May 21, ith Brigadier George Riddoch, the president, in the air, a discussion on

Traumatic Epilepsy

as opened by Major Hugh G Garland, RAMC, who id that the extreme diversity of opinion regarding the cidence of epilepsy after cerebral trauma was probably ue to the degree of selection by different authors, but was clear that epilepsy was particularly liable to follow nshot wounds Ashcroft's figure of 34% in such ses was however, surprising in view of the previously uoted incidence of 4½% in 18,000 cases Both these gures have been obtained from Ministry of Pensions cords Epilepsy was twice as common when the dura as penetrated or when sepsis had occurred, even with e dura intact The high incidence of epilepsy after ross localised lesions was not unexpected when, accord-g to Penfield, 44% of all supratentorial tumours pro-uced fits He did not believe that the incidence of pilepsy after recovery from brain abscess was less than 0% While epilepsy following gunshot wounds was ell known, had a gross pathology, and had opened up promising surgical therapeutic field, fits after " closed " ead injuries were much less clearly understood The atistics were again confusing, but Rowbotham's 2 5% of 50 cases and Russell's 3 5% of 200 cases, both from milar sources, suggested that 3% is something near he truth Adopting another method of approach, he ad analysed 2600 Service patients, referred to him as neuropsychiatric " cases Of the 244 epileptics, 77% ppeared to be idiopathic, and of the remainder 16% ad suffered head injury prior to the onset of fits That his high figure signified that the trauma was causally elated to the fits was borne out by the late onset of pilepsy (43% after the age of 25), by the rarity of a amily history of fits, and by the strikingly high incidence f severe injuries In the large majority, the fits started ithin a year of the head injury, though the interval aried from a few weeks to 18 years In all cases of raumatic epilepsy, the commonest fit was the general-sed convulsion Jacksonian fits were less common han had been thought, and in his series there had been one Psychomotor attacks coexisted with major fits n two instances, and minor with major in three It might be that where such types of epilepsy occurred the rauma had merely precipitated them in a potential diopathic epileptic Attacks previously called " minor " might be syncopal, and the EEG might ultimately solve this problem, which was of great importance in prog-nosis Recent work with the EEG suggested that there was an epileptic tendency in 10% of the population, which might well account for all cases of epilepsy following civilian head injuries, and Lennox, Gibbs and Gibbs had found three times as many epileptics in the near relatives of symptomatic cases as in non-epileptics, which suggested an inherited tendency At the same time, in medico-legal work trauma was as important as a precipitant as if it were the only causal factor

Mr Norman Dott, FRCSE, said that the surgery of brain tumours provided a good example of individual predisposition to epilepsy, for which there was now evidence of an inherited tendency If the gliosis around a tumour did not cause epilepsy it was extremely rare for it to develop in the scar left after surgical extirpation The epileptic resistent person would not exhibit fits under either stimulus Modern methods of investigation revealed that birth injury to the brain or its blood-vessels was a more frequent cause of epilepsy than had hitherto been supposed But whether the injury occurred at birth or later whether it was large or small, single, multiple or diffuse, it was less the direct rupture of cerebral tissue than the injury to blood-vessels, and the further extending traumatic thrombosis, which was seriously damaging One could consider trauma as essentially a vascular lesion of the brain It was true that extensive cerebral cicatrisation favoured epilepsy, yet a minute cicatrix would cause epilepsy in a highly susceptible subject while a massive one would not do so in a resistant person This raised the difficult question of attributability, and he believed that one could exclude a given trauma as a causative or aggravating agent only if the patient was having fits before it and the fits continued unmodified in type and frequency after it Trauma could affect any part of the brain and it seemed most convenient to classify seizures by naming the principal function affected—for example, psychic, somato-motor, somato-sensory, viscero-motor, &c The terms petit mal and grand mal were unscientific and he mistrusted such designations as cortical epilepsy and diencephalic epilepsy There was a risk of pushing scientific nomenclature beyond scientific knowledge The pattern of the seizure depended on the site of origin and mode of transmission of the abnormal neuronic discharge, which travelled in two ways—rapidly along existing neural connexions to other stations of the nervous system, and much more slowly by irradiation through the cerebral substance, without relevance to neural connexions Though traumatic fits remained consistent in type, a transition of petit mal to grand mal would suggest an identical focus, with a difference in extent of irradiation When intracerebral hæmorrhage was still in progress, immediate prophylactic surgery was required to prevent further damage, and minutes might count In general, the aims were conservation of function and avoidance of scar formation—by asepsis, by removal of all clot, damaged cerebral tissue and foreign bodies, and by the preservation of the leptomeninges When traumatic epilepsy was established cases for surgery should be selected with a localised single scar, radical excision of which would not inflict serious loss of function, and in whom medical anticonvulsant therapy had failed All those with a strong predisposition to epilepsy should be rejected While this left a small minority, the results of excision of the scar, backed up by continued anticonvulsant medicinal treatment, were approximately 25% cured, 50% improved and 25% unimproved

Mr W Grey Walter said he approached the problem as a physiologist concerned with the electrical properties of the brain The varying statistics were confusing but there appeared to him to be certain relevant facts Evidence from the EEG showed that the fit was only part of the epileptic picture, and electrical abnormalities were commoner in young patients, being almost invariable in the child who has suffered a birth injury The EEG changes during fits were always the same, irrespective of the cause, but in his experience petit mal was never seen after trauma If it occurred it was not attributable to trauma As he had found no case of traumatic epilepsy with an EEG differing from idiopathic cases there appeared to be little hope of distinguishing by this method between the latent epileptic and the case in whom it was wholly acquired By measuring the convulsive threshold in normal people he had found the variation to be as high as 1000% In some, no current would produce a fit, while others were very sensitive These variations were not associated with EEG differences, but they might account for the varying incidence of epilepsy following trauma He had two cases to demonstrate In the first, attacks of twitching of the face and hands had developed after a comparatively trivial blow on the side of the head This persisted despite surgical removal of the area involved, through which the course of the abnormal electrical discharge during the attack could be observed in the EEG He considered that here the phenomenon was due to minor interference with the blood-supply by perivascular gliosis resulting in interference with oxygenation and removal of metabolites The genetic background was not such as to allow a generalised convulsion, and, apart from the area of the cortex isolated, the EEG of the rest of the brain was normal The other case had had a series of major fits in 1938 and the EEG had then shown bilaterally synchronous slow waves of epileptic type In 1940 the patient was readmitted in status epilepticus and died The fits were now jacksonian in type, with localisation to the right hand and face At autopsy a glioma was found in the left frontal lobe In this case the genetic background had been such as to allow very readily the production of generalised convulsions Mr Grey Walter suggested that the problem of traumatic epilepsy could be solved only by the cooperation of a large number of workers studying it from all angles

Colonel Colin Russell, RCAMC, asked what proportion of alleged idiopathic epileptics were not really symptomatic Birth injury was an important factor in those cases with an onset at about the age of 12 years It was not only the difficult labour which might produce cerebral hæmorrhage The moral was that minor head injuries should be taken more seriously and that every case should have a lumbar puncture

Mr D W. C Northfield, FRCS, asked Dr Greenfield whether a scar acted by contracting down or whether by reason of its presence as a mass of tissue Also, had Mr Grey Walter any views as to the channels by which material should be drawn

Dr J G Greenfield said that gliosis was much slower than connective-tissue scarring, and, while there was a certain amount of evidence of a slow pull in the former case, whether it could disturb the ventricles was doubtful He could not agree with Mr Dott that the effect was purely on the vessels but thought that it was more focal damage to the brain that resulted in epilepsy

Dr Russell Brain said that the fundamental problem of epilepsy remained unsolved—namely, whether the attack was primarily excitatory or inhibitory Was the epileptogenic property of a scar in the brain due to irritation or loss of function? If the latter, the effects of excision must be limited to improving the function of surrounding areas In the present state of the law, claims for compensation were settled within a year or two of a head injury If epilepsy developed later, no compensation could be obtained This injustice should be removed by allowing the case to be reopened

Prof Geoffrey Jefferson, FRCS, said he was cautious of accepting EEG evidence as final Since practically every patient with a slow-growing glioma developed fits, the proportion of persons with predisposition must be higher than 10% He recalled that Foerster thought that about half the population could have epilepsy In traumatic epilepsy he wondered whether the late cases were due to the trauma While in these cases the peak age was 30, in idiopathic epilepsy the peaks were infancy and adolescence. He thought that the size of the scar mattered and not so much its attachment to the meninges The exciting cause must be the change in circulation and later biochemical changes in the cell itself He agreed with Dr Russell Brain that new legislation was required in these cases

Mr Dott said he thought proneness to epilepsy was a sliding scale, rather than that 50% were susceptible According to Mr Grey Walter there were only a few who were totally resistant to the convulsive phenomenon —Mr Grey Walter thought the MRC subcommittees could do very valuable work in collecting and collating material Regarding Dr Russell Brain's question, there could be inhibitory and excitatory fits, but it was possible to demonstrate which only by taking the electrical records from agonists and antagonists during the convulsion

In conclusion, the Chairman said he was sure the MRC subcommittees could and would cooperate along the lines mentioned

---

War time Nurseries —The Royal College of Nursing is to give further courses for nurses taking up posts as matrons and sisters in war time nurseries, day and residential The courses are arranged in conjunction with the National Society of Children's Nurseries and the Association of Sick Children's Hospital Nurses The fourth course of two weeks of lectures and observation visits, with a further optional week of practical work, will start on July 6 It will be free to suitable nurses on the general and sick children's part of the Register who undertake to work in a war time nursery Particulars can be obtained from the director in the Education Department, Royal College of Nursing, 1a, Henrietta Place, Cavendish Square, W 1

COLLECTIVE FEEDING IN WAR-TIME

The third scientific meeting of the Nutrition S which took the form of a conference on the problems collective feeding in war-time, was held on May 30 at London School of Hygiene The chair was taken at morning session by the Dowager Lady Reading and at the afternoon session by Prof V H Mottram The chairman of the society, Sir John Orr, who was unable to attend, sent a message of appreciation to the Minist of Food, who opened the conference, and his advisers, Professor Drummond and Lord Horder in which he said that a recent survey in Scotland had shown that a large number of people including children were actually better nourished now than before the war The presence of the minister at the society's meeting indicated his desire to establish, and to maintain after the war, a food policy based on the nutritional needs of the people

In his opening address, Lord Woolton spoke of his faith in his nutritional advisers There had been, and he was convinced there always would be, sufficient food to go round—the only problems were what types of foods to supply and how best to distribute and prepare them Evacuation, large numbers of women working in factories, and the increased hours of industrial workers, meant that much could be done by collective feeding During the last year 1400 British Restaurants were opened and 94 million meals a week were now being served It was necessary to provide not just "food" but the right sort of food for different sorts of people Particularly was it important that the needs of children, so different from those of adults, should be carefully planned We no longer thought that school meals should be provided only for poor and malnourished children, the problem of physical need had nothing to do with the ability to pay Now we have the knowledge for correct and adequate nutrition we should be sinning against the light if we did not use this knowledge

The Dowager Lady Reading said that the conference would do a great deal of good in bringing together the practical and the academic aspects of nutrition Academic and theoretical knowledge could be best imparted to the practical cook by an appreciation of her efforts, by praise and encouragement of the women who had an important but little appreciated task to perform

ORGANISATION OF MASS CATERING

Squadron-Leader Salmon gave an account of large scale catering as seen in the RAF An attempt had been made to meet the needs of the serving men and women by careful consideration of the type and nutritional value of the food and of the best way of preparing it This was ensured by frequent and regular meetings of the mess committees, comprising the catering officer, the cooks and representatives of the service personnel The committee planned the week's menu in advance and considered as much as possible the desires of the people concerned It was not always realised that goods rationed to civilians were also rationed to the forces The aim was not only to see that the quantities of foods, especially those which are rationed, were not overdrawn but also to see that they were not underdrawn since these foods have high nutritive value On the larger stations a great deal of saving could be effected by centralisation, thus in a central depot fat could be rendered, meats carved and sausages prepared In spite of this centralisation, excessive rigidity was avoided and varying types of meal were supplied to suit the different requirements of the different types of personnel The training of cooks was planned in such a way that theoretical and preliminary teaching, necessarily in small scale cooking, was followed by practical teaching in large scale cooking The great number of cooks now being trained in the Services might have an important effect after the war, in industrial canteens and institutions, and, perhaps more important, in the home

Major R G Leggett, RAMC, spoke of conditions in the Army On the whole, the problems arising and the solutions adopted were similar to those in the Air Force There were, however, certain differences, in particular the fact that there were in the Army many small units such as searchlight and coastal posts —Surgeon Rear-Admiral J W McNee pointed out that whereas conditions in shore establishments of the Navy resembled e in the other two Services, conditions afloat were varied, ranging from the large battleship, with its blems of mass-catering, down to the mine sweeper corvette, conditions in submarines were clearly cially difficult —Miss R H HAMILTON CRICHTON AAFI told of the part played by her organisation in viding food for the Services It supplied certain modities such as bacon, butter and unrationed ds to the catering departments of the services in ition to the provision of refreshments in their own teens —Mr F LE GROS CLARK reminded the confer- that the classical example of collective feeding was e seen in the Soviet Union where "kitchen factories" epots were begun in 1925 By 1935 there were 27 of e in Leningrad, 25 in Moscow and many others of the Moscow depots prepared 200,000 courses and 55,000 school-children a day To a large extent, e depots sent out prepared foods, that is, foods not ked but ready for cooking Some of the factories also restaurants attached and, in addition, some provided tially cooked meals on a "cash-and-carry" basis

r W A NICHOLSON and Miss KEAY suggested that e was possibly more waste than was known to the horities and that the keeping of pigs on stations might ually encourage waste —Miss E H TRECHMAN was ious of the Services because they had most of the ilable young women who could be fairly easily trained cooks, civilian canteens in consequence had mostly er women who found it more difficult to adapt them- es to the new conditions of mess-cooking

quadron-Leader SALMON, in reply, said they were ing to encourage those with experience to become ks in the Air Force The consumption of vegetables s on the whole satisfactory and there were almost ays two vegetables offered in addition to potatoes ong recent improvements were a great reduction in ste and an attempt to increase the interest of the dical officers in food and nutrition

FOOD-SUPPLIES FOR COLLECTIVE FEEDING

In the absence through indisposition of Professor ummond, Mr MAGNUS PYKE, Ph D, described some the work of the Ministry of Food The aim of the itish Restaurant was to supply in one meal a third of e day's requirements of protein and calories and two- rds of the vitamins and mineral salts Two difficul- s, however, had to be faced One was that there s still a great deal not known about nutritional quirements, this meant that as far as possible it ould be food that was supplied rather than doses vitamins The second was that requirements differed different classes of people, such as factory workers and hool children, this was met by supplying varying pes of meal in the varying types of canteen Even ese meals, however, could only be evaluated on the sis of average requirements and Dr Pyke gave amples of some of the investigations carried out to termine the range of variation in canteens Thus, in specimen meals from British Restaurants the amount potatoes varied from 1 oz to 14 oz, the amount of tamin C was less than 10 mg in 8 of the meals and over mg in 5 meals As far as vitamin C was concerned, e main difficulty was the destruction of the vitamin hich occurred when vegetables were kept hot, owing transport problems this was often unavoidable But was nevertheless possible to obtain 10 mg or more vita- in C in a meal which had been kept in containers for hours or longer

Mr R J L ALLEN, Ph D, stressed the value of dried odstuffs in war-time, especially from the point of view ease of storage and transport The aim in the anufacture of these foods was to provide something alatable and nutritious and the preparation of which as simple and resulted in no loss of nutritive value —rof J R MARRACK described some tests he had con- ucted on the vitamin-C content of school dinners In eneral his results agreed with those of Dr Pyke An nteresting fact was that the vitamin C in the meals was eater in those schools which grew more of their own een vegetables and the children showed better sponses to the "saturation" test It was important to p a proper sense of perspective in recommending the onsumption of raw vegetables, the amounts eaten were sually small and consequently the amount of vitamin C was frequently much less than in an ordinary portion of well-cooked vegetables —Surgeon-Commander C C UNGLEY confirmed the finding that the quantity of vitamin C was often low in meals cooked on a moderate or large scale —Mr L W. MAPSON, Ph D, pointed out that one way of reducing the loss of vitamin C in cabbage was to cut it into thick slices before cooking so as to minimise the amount of water necessary Another way was to use water in which the outer leaves had been cooked first, in this way, very little more would be dissolved out of the edible portion

EFFECT OF LARGE-SCALE PREPARATION ON NUTRITIONAL VALUES

Squadron-Leader T F MACRAE pointed out how little we knew of the changes in nutritional values produced during the preparation of food Most of what was known concerned vegetables and the loss in them of vitamin C Half of the vitamin might be destroyed between gathering and cooking This problem was being tackled by increasing local supplies of vegetables Another source of loss was in the cooking This could be greatly diminished by adding the vegetables in several portions at intervals to the boiling water so that the temperature remained sufficiently high to destroy the enzymes which acted on the vitamin Loss was also favoured by keeping the vegetables hot for some time before serving, and cooks were now instructed to cook the vegetables last and serve as soon as possible By careful instructions to the cooks, and by rousing the interest of the medical officers as well as the catering officers, these improvements could be effected

Miss M OLLIVER felt that the interest of investigators in vitamin C was justified in view of the shortage of fruits and the fact that almost the only source between December and late June was vegetables The possibility of mild deficiency was very real, particularly in the late spring and early summer, when the supply of green vegetables was short and the vitamin C of potatoes had reached a very low value To avoid this possibility, the production of green vegetables near the feeding centres, especially of broccoli in spring, should be encouraged, and the water used in cooking the vegetables should be used for gravies and soups —Miss TRECHMAN said that in practice it was difficult to carry out these suggestions, at any rate in civilian canteens, owing to a shortage of staff —Mr A L Bacharach, B Sc, said that the present extensive large-scale cooking afforded a unique opportunity for extending our knowledge of the effect of preparation on the nutritive values of foods

In reply, Squadron-Leader MACRAE agreed that vitamin C was of great importance and said that our aim should be to provide more than was necessary merely to prevent scurvy

GENERAL DIETETICS OF COMMUNAL FEEDING

Four papers were read on this subject Miss M ABRAHAMS spoke on the rôle of the dietitian Before attempting to assess the value of civilian communal feeding, we should consider the domestic diet which canteen food was to supplement An analysis in January, 1942, had shown that a diet of 3000 calories based on rationed and unrationed goods could be obtained for 9*s* 6*d* a week and would be adequate in all respects except calcium and vitamin C The position with regard to calcium was to some extent alleviated by the extra milk and cheese rations for special classes, and as a result it was likely that only adolescents between 12 and 17 continued to be short of this mineral Vitamin C was a more difficult problem, since in the winter and spring vegetables were expensive An analysis of 41 canteen meals showed that the calorie content varied from about 500 to 1800 and the calories for a penny from 41 to 163 Only 6 meals gave over 1000 calories, a third of the requirements of a person needing 3000 calories daily

Miss I M CLIFT, speaking of industrial canteens, pointed out that factory inspectors had powers to insist on the provision of a canteen in factories employing more than 250 workers There were now 7500 factories with canteens compared with 1500 before the war The problem of providing an adequate meal in a short time, for people working longer hours and under conditions of strain, was worthy of considerable attention and effort One difficulty was in overcoming conservative food habits, but by making dishes as attractive as possible and by perseverance much could be done Miss Clift pleaded for an increased recognition of the importance of the vegetable cook, whose status at present was considered to be inferior to that of the pastrycook or meat cook

Miss M C Broatch described school canteens Owing to evacuation and the subsequent return and re-evacuation of children, it had not been easy to arrange effectively the school canteens in London But the importance of doing so had increased with the call-up of so many women In some cases the food was cooked in the school, but more often it was cooked at a central kitchen and then distributed to neighbouring schools About 50,000 school meals were now served daily in London The feeding of children was in many ways not so easy as that of adults It was often difficult to get the child to eat, either because of conservatism, or because of unattractive surroundings or because it wanted to get out and play These difficulties could be overcome but frequently there was insufficient staff to deal with them adequately

Mrs W Parsons discussed collective feeding and the housewife There were, she said, a number of housewives who could not easily avail themselves of canteen facilities It should however still be possible to relieve these women of the drudgery and boredom of preparing meals each day for one or a few people, a state of affairs which was incidentally highly inefficient One solution would be a "cash-and-carry" system at the British Restaurant, so that these centres would be used for collective cooking as well as collective feeding Another possibility would be the provision of prepared but uncooked foods, as was done in the Soviet Union This might perhaps be done in smaller units and one could envisage the delivery by tricycles of clean potatoes instead of ice-cream

* * *

Summarising the day's proceedings, Sir Joseph Barcroft said that the conference had shown the need for a new attitude towards food preparation A "New Cookery" was required and its development would be accelerated by discussions such as those today The function of the society would perhaps best be served, and its deliberations implemented, if its general conclusions could be made generally available, and it was hoped to publish regularly proceedings of the meetings Lord Woolton had specifically asked for the advice of the society, and Sir Joseph suggested that, perhaps by forming a few subcommittees to deal with special problem members might undertake to furnish the minister with authoritative nutritional data

Reviews of Books

Health of the Future

Aleck Bourne, M B Camb, F R C S, F R C O G
Penguin Special Harmsworth, Middlesex Penguin Books Pp 192 9*d*

Those who have been successful are usually the staunchest exponents of laissez-faire, but Mr Bourne is a notable exception In this small book written for the lay public he restates the case against medical service as it exists in this country today and his criticisms, though familiar, are largely unanswerable In poverty, ignorance, economic insecurity and boredom he sees the quite unnecessary obstacles to the achievement of positive health, unnecessary because they are remediable in the light of modern knowledge He is a whole-hearted advocate of state medicine but, like many avowed socialists, he brushes aside, a trifle too impatiently perhaps, the arguments of the opposition He shuts his eyes, for instance, to any evidences of apathy in existing state medical services and attaches little importance to the spur of economic competition, no doubt these undesirable things can and will be educated out of the profession in time but it is idle to deny that they are there in places, to be reckoned with at the moment Nor would it be useful to remove the economic incentive until another and better stimulus can be substituted for it The dread of a general levelling of performance down (rather than up) produces, often among the most conscientious doctors, some antagonism to state medicine

Nutritional Deficiencies

John B Youmans, M S, M D, associate professor of medicine and director of postgraduate instruction, Vanderbilt University medical school, Nashville, Tennessee
London J B Lippincott Co Pp 385 30*s*

Many clinicians must have been bewildered by the variety of claims made for the share of vitamin deficiencies in disease Many such claims rest on slender evidence and the clinician often too busy and not always sufficiently specialised to appraise the evidence, tends either to prescribe vitamin preparations indiscriminately or to become sceptical of even the genuine recent developments For the first time, a book has been written which can be recommended to the most general of practitioners Dr Youmans insists on assessing the evidence for any deficiency by several tests A history of inadequate diet or faulty absorption, the presence of signs and symptoms, the use of special laboratory tests—by critical examination along such lines it is often possible to avoid rash diagnosis and irrational therapy He emphasises the difficulty of detecting mild or early deficiency disease Frank xerophthalmia, beriberi or scurvy are easy but rare in Western countries, slight deficiencies of vitamins A, B_1 or C are more difficult but much commoner, since they are probably responsible for much ill health and decreased resistance to infection they are important The book includes chapters on protein, iron, calcium and iodine deficiencies, and at the end there is a summary of information about the vitamins and a list of their principal sources An account of laboratory methods of diagnosis is timely and accurate Apart from a few small errors, mainly in some of the chemical sections, the book is clear, reasonable and wholesomely lacking in dogma

Treatment of Fractures

John A Caldwell, M D; professor of clinical surgery University of Cincinnati, director of the fracture service Cincinnati General Hospital London Baillière, Tindal and Cox Pp 150 19*s*

In the preface to this manual on fractures Professor Caldwell says that it has been written to elucidate principles of procedure rather than detail It is evidently an account of the methods which he has found of value in the fracture service of the Cincinnati General Hospital, and most of them are being taught and practised in this country But not all of his views will find acceptance, many will differ from his view that stiffness and disability after splinting can be prevented by "frequent changing of the splint and by judicious massage and passive motion" This method is advocated in the chapter on the treatment of fractures in general, but since no further mention is made of it in the detailed descriptions which follow, it may be assumed that it does not really express Dr Caldwell's practice He advocates open operation (Bunnel's) for dislocation of the acromioclavicular joint in cases which cannot be maintained in reduction by strapping, and seems to have found reduction extremely difficult to maintain, this does not tally with experience here where conservative treatment is more usual for this injury than operation In fractures of the shaft of the humerus below the deltoid insertion, he uses Middledorf's splint, and advocates immediate exposure of the radial nerve in cases complicated by wrist-drop The treatment of fractures of the patella by excision is not mentioned, although Brooke's paper is listed in the references This operation is sometimes essential for comminuted fractures, and deserves a place He advocates internal fixation for torsion fractures of the shafts of the tibia and fibula, his choice of Parham's bands as internal splints is unusual Fracture surgeons should be able to deal with the fractures of the skull which in war-time so often complicate—or rather are complicated by—fractures of trunk and limb bones; Professor Caldwell is to be congratulated on the short but practical and complete chapter he has written on this subject References to outstanding recent publications are given at the end of every chapter, and the book amply fulfils its purpose of serving as a guide to students, house officers and general practitioners

"Functional Pathology" by Dr L Lichtwitz can be had from Messrs William Heinemann, price 42*s*

THE LANCET

LONDON SATURDAY, JUNE 13, 1942

APTITUDE TESTS FOR THE ARMY

PSYCHOLOGICAL tests are coming into their own Those who have had to design and evaluate them for industrial purposes have recognised that they were more successful in eliminating the unsuitable than in selecting the suitable, and that psychological attributes which could not yet be measured by tests might be more indicative of fitness for a particular job than deceptively precise scores and ‘ profiles ’ Nevertheless the field for psychological testing has expanded since after all the aim of the vocational tests is to standardise as far as possible the conditions under which the subject must carry out the future task or a task reproducing some of its essentials It can fairly be claimed that the RAF selection tests, in spite of some failures have accomplished a great economy of time money and effort, and a levelling up and probably improvement of efficiency in a good many directions There is still a need for training gadgets of all kinds and adequate scoring methods capable of being used accurately with operational processes and for a radical revision of experimental and clinical methods for the evaluation of temperament Intelligence tests and aptitude tests are to be used in future for determining at a very early stage of training whether a recruit to the Army should be posted to this or that arm of the Service The value of intelligence tests interpreted with the safeguards insisted on by experienced psychologists and psychiatrists is beyond dispute , the place of vocational tests is not so assured but intensive investigation directed to military needs has borne fruit A recent announcement by the Adjutant General describes the admirable reform whereby recruits will not be allocated to a particular branch of the Army before their training has begun, but will first serve with a General Service Corps, spending six weeks in the primary training centres There tests will be applied It will not, however rest solely or mainly on the results of these tests whether the man is set the duties of a clerk, a driver, a signaller, a tradesman, an infantryman or any other job when he is posted Interviews, civilian experience and qualifications, and (it may be assumed) the reports of his officers and instructors during his period of preliminary training will be taken into account and a recommendation made that he be trained in one of two or three broad categories There will be ten such categories Overspecialisation can be dangerous and to rely on aptitude testing as the main guide to a man's suitability would be to expect far more from psychometric methods than they can at present yield The requirements of the various branches of the Army must take precedence, and previous experience and aptitude in some trade may be no sure indication that a man should be so employed if he is capable of learning any other kind of Army work for which men are more urgently needed The worth, however, of sensible selection and allocation of men to appropriate work needs no argument to support it It may be accepted that this reform will, as the Army authorities expect. strengthen the regimental system reducing the transfers after posting and the number of men who are capable of more skilful or more necessary work than they are given to do , it will also make it unlikely that men will be trained for work unsuited to their capacity and too difficult for them The advantages for efficiency, morale and mental health are plain

PATHOLOGY OF THE BURN

WITH the tannic acid treatment of burns temporarily under a cloud, and the rival claims of other local therapies being loudly heralded by their respective protagonists the essential pathology of the burn may be lost sight of, and with it the general principles which should guide the surgeon in his handling of burned patients In civil practice a large proportion of burns are minor and require little more than local treatment, but war has brought a high incidence of severe burns which demand systemic as well as the most appropriate local therapy The Scottish EMS memo on the hospital treatment for burns [1] briefly reviewed in these columns last week, therefore does well to describe their local and general pathology before discussing treatment The classification of burns is still confused and in recent years there has been a desire for simplification from the six degrees of Dupuytren to either partial and complete or superficial and deep, neither of which is wholly satisfactory (though Scotland plumps for the latter) Perhaps the most practical division is the three degrees used in America, representing erythema vesication or more extensive damage to epidermis and destruction of the whole skin including sometimes, deeper tissues All three degrees may be found in the same burn but bacterial infection can occur only with the second and third Vesication, which may take hours or even days to develop is due to the accumulation of fluid in the deepest layers of the epidermis except in the palms of hands and soles of feet, where it is more superficial and when the blister-covering is rubbed off as usually happens it leaves exposed exquisitely tender skin-papillæ The pain associated with burns of this degree must be an important factor in the body s reaction and more attention should be given to local analgesia in treatment As long as the corium or true skin is not destroyed, epithelialisation of the burned area takes place satisfactorily, and the newly formed skin is elastic and contains hairs and sweat-glands With deeper burns, the dead epidermis usually adheres to the underlying tissues as a black leathery, insensitive eschar , if it can be removed the corium appears grey and opaque or it may have a mummified semi-translucent appearance with thrombosed veins showing through it The surface in these deeper lesions is dry (though there is œdema underneath), the necrotic tissue separates slowly like a dry gangrene, and the granulating surface depends for its new covering on epithelial growth from the periphery It is in such burns that unsightly scars, contractures and keloids result and the skin is shiny dry and hairless

The general pathology of a severe burn is more speculative although the early stages present the classical features of shock There may be a primary nervous shock, akin to the vasovagal syndrome, followed by secondary shock associated with dilatation of capillaries and outpouring of plasma proteins at and near the burned area, and death may follow from diminishing blood-volume, falling blood-pressure and anoxia The blood changes accompanying these phenomena are increased viscosity and hæmoconcentration (hæmoglobin values may be 110–120%), a shift of sodium and chlorides from plasma to cells and of potassium from cells to plasma, a rise in non-protein nitrogen and a lowered CO_2-combining power With appropriate treatment, the patient improves after 24 hours and his subsequent progress gives little cause for alarm unless serious bacterial infection supervenes Sometimes, however, after apparent recovery from shock, the general condition worsens, there is a rise of temperature, accompanied by mental disturbances, oliguria and albuminuria, a fall in plasma proteins, a rise in blood-urea, and occasionally jaundice, and the patient may die with evidence of severe hepatic and renal damage The *pathogenesis of this toxæmic stage, as* WILSON[2] *has* called it, is still in doubt, though it seems to have points in common with that of "crush syndrome" While it is a rare complication, bacterial infection is still too common, despite the use of antiseptics locally, sulphonamides by mouth and better preventive measures Finding the large abraded surface an excellent breeding-ground, the hæmolytic streptococcus, the most important though not necessarily the most common bacterial invader, sets up an infection varying in severity from local sepsis with little apparent delay in healing to a generalised septicæmia, and, as CRUICKSHANK[3] has shown, its prevalence in the burns ward is associated with an increased incidence of sore throat and scarlet fever among both patients and staff

---

[1] Edinburgh H M Stationery Office Pp 39 9d.

Knowledge of these phenomena which control the clinical course of a burn will guide the surgeon in his treatment He will realise the absolute necessity of shock treatment, including the more frequent use of intravenous plasma or serum but not saline or glucose, before dealing with the local burn, he will be careful in his choice of a general anæsthetic, he will keep a sharp look-out for the toxæmic stage, and he will take appropriate measures to prevent and control bacterial infection both in the individual and in the ward His choice of a local dressing will depend on a number of variables—his own and the nursing staff's experience of a particular therapy, the nature and site of the burn, and the nursing and other facilities available Each local therapy—coagulation by tannic acid, silver nitrate or the antiseptic dyes, oils, emulsions or pastes, and saline packs or baths—has its advantages and disadvantages which are well set out in this practical memorandum

PAIN IN PEPTIC ULCER

FOR long it was thought that gastric hydrochloric acid was the main factor in the causation of peptic ulcer pain Hyperacidity was indeed regarded as a veritable disease in itself, instead of a mere secretory finding of variable significance We now know that though high gastric acid secretions may occur with duodenal or (less often) with gastric ulcer they are by no means constant and bear little or no relation to the presence or absence of pain Instillation comparatively high concentration of hydro acid into the stomach in patients with and active peptic ulcer fails to produce any pain It has also been repeatedly shown that relief of pain which so often follows frequent feeds is not necessarily, or indeed commonly, as ated with any reduction in gastric acidity mystery of painful or painless peptic ulceration is yet far from solved, for the symptoms may often dramatically relieved by a variety of measures w severe active ulceration can still be observed gastroscopically It is, for instance, the rule to find uncomplicated peptic ulcer pain entirely relieved after one or two days of strict feeding and rest, with or without alkalis At the same time an ulcer patient may be as rapidly relieved of symptoms—at least for a time—by the injection of histidine, glucose or normal saline intramuscularly, even without strict attention to diet or rest In neither case is the ulcer *healed at once, though symptoms are gone Of the* factors which especially seem to excite ulcer pain may be mentioned hunger, cold, anxiety, fatigue, and perhaps strenuous physical work Since acidity as such plays little or no part it is generally thought that muscular spasm, either tonic or peristaltic, must be the pain-producing mechanism Thus cold has been shown to increase gastric tone and motility and the empty stomach shows well-marked peristaltic hunger contractions Nervous influences again may also excite gastric contractions and investigations have shown increased spasmodic contractions in the gastro-intestinal tract under emotional stimuli

Lately BRUN,[1] of Copenhagen, has suggested that the pain in peptic ulcer is directly due to spastic contraction of the gastric arteries and arterioles, thus bringing it somewhat into line with "ischæmic" pain such as is seen in coronary disease or intermittent claudication His investigations showed that powerful hunger contractions are strong enough to stop the flow of blood through the stomach, or parts of it, presumably for several seconds, and that as a result changes of tone occur in its arteries and arterioles In support of his views BRUN observed the reaction in 9 cases to the oral administration of adrenaline He introduced a balloon into the stomach connected to a tambour, the pointer of which recorded changes of pressure in the balloon on a kymograph On taking doses up to 4 mg at a time in 1 2000 solution—and these would be regarded as small doses for adrenaline by the mouth—ulcer patients developed dyspeptic symptoms varying from cardiac oppression to the most violent pain, closely agreeing with the patient's own spontaneous symptoms Judging from the balloon pressures these pains were most severe when they coincided with gastric hunger contractions, but they were sometimes present when the stomach was at rest BRUN concludes that spasm of the gastric arteries provoked by adrenaline may directly cause gastric pain, and that vascular contractions in the splanchnic region explain much of the harmful influence of cold and hard muscular work on ulcer pains, as well as the anatomy and pathology of peptic ulcer It is certainly widely agreed that local ischæmia plays an important part in the causation of peptic ulcer, but it is difficult to believe that adrenaline given by mouth can exert so powerful an effect on gastric circulation In confirmation of his views Brun mentions the relief of symptoms by nitroglycerin in 0 25 mg doses acting as he considers by dilating blood-vessels The effects of adrenaline on the gastro-intestinal tract differ widely according to the part of the gut concerned and are more easily produced when the drug is given by injection Thus Dennis[2] has recorded the relief of pain in 7 out of 9 cases of acute appendicitis by the subcutaneous injection of 0 5 c cm of 1 in 1000 adrenaline, an effect which he ascribed to relaxation of the circular muscle of the appendix, so relieving the muscular tension in its wall which was producing the symptoms

---

[2] Wilson, W C *Spec Rep Ser med Res Coun Lond* No 141 1929

[3] Cruickshank, R *J Path Bact* 1935, **41**, 367

[1] Brun, G C *Nord Med* 1942 **14**, 1135

As with all such subjective results involving the effects of drugs on pain, it is difficult to exclude emotional and other disturbing factors The broad view, however, that the pain of peptic ulcer—and perhaps of other intestinal disorders—is associated with muscular spasm, arteriole contraction and ischaemia offers some explanation of the diverse factors which may produce or relieve it We still await the fuller work which will elucidate the exact way in which chill or worry may excite, and warmth, rest or food relieve, the ulcer patient's pain

INDUSTRIAL DERMATITIS

Few doctors are as yet trained in industrial medicine, and those few are mostly interested in specialised branches rather than the subject as a whole, but medical schools are beginning to arrange courses and it is a sign of growing interest that the Leeds division of the British Medical Association recently called a meeting to discuss industrial welfare, which representatives of workers and employers, the Royal College of Nursing the public-health authorities and the Ministries of Health and Labour were invited to attend Some of the difficulties in the relationship of the works doctor to his patients were indicated at the conference on the health of the war worker[3] held in London on May 16 The workers, it seems, feel that doctors appointed by the employers are not in a position to insist that welfare measures be adopted or to enforce any positive drive for health

One unhappy source of misunderstanding in industry is industrial dermatitis The term has come to evoke, for worker and employer, the rival aspects of compensation, and often the general practitioner who is serving as medical officer to a factory is made the arbiter, though he may have no extensive knowledge of the chemicals used in the industry or of their effects on skin Mumford[4] points out that the dermatologists can seldom give much help over prevention because they know little of the circumstances in which the workers are employed The first step, he thinks is to explain clearly to workers and employers that dermatitis simply means inflammation of the skin It may be due directly to industrial processes—in which case it should be prevented—or it may attack the eczema-prone subject for reasons which may or may not be related to working conditions whether physical or emotional In either case it will not be prevented or relieved by the antiseptics, scrubbing-brushes and sand provided by well-meaning managements but calls rather for warm water vegetable-base soaps and soft dry clean towels. The worker who acquires dermatitis must be assured that he is not going to infect his family with his irritative lesion. He is often in fear of reporting his trouble because his doctor will advise him to stop work and while he is away his wage packet is less than half in some factories too he has reason to fear that he will be allowed to recover only to be dismissed on his return to work Yet soothing treatment and a transfer to another department in the early stages, may cure him Again the man who reports early to his foreman may simply be given a pair of rubber gloves, which can only make matters worse once the skin has become inflamed Indeed rubber gloves have drawbacks at any stage. They are impermeable it is true but they hinder the worker s finer movements, and he is apt to take them off to do delicate jobs When he puts them on again his skin is probably contaminated and the action of the irritant will be enhanced by the warmth and sweat inside the glove Moreover, irritants may trickle past a loose glove cuff Probably protective agents rubbed on the hands are better but these should be chosen with regard to the chemicals the worker will encounter Almost every protective used at present is a commercial preparation chosen on the strength of its advertising matter Mumford doubts the existence of the perfect agent, but classifies those available Paraffins, fats and waxes may be useful against water-soluble irritants or insoluble powders Tragacanth agar, starch and other colloid-forming jellies are unstable water-soluble and easily broken though cosmetically pleasant A clay base forms an inert adsorbent cover which workers like, but it breaks easily and rubs off when dry Emulsions are pleasant and effective against dust, but encourage the penetration of oil-soluble irritants Clay-soap bases are elastic and adsorbent and do not rob the skin of much grease, but they are alkaline and will not mix with hard water and they must not be worn with rubber gloves—a fact not always borne in mind by a zealous foreman Liability to dermatitis depends on the type of skin of the worker as well as on the irritant Young and old skins are both more delicate than the stout skin of the middle years, and the dark, oily-skinned adolescent can tolerate fat-solvent irritants but is hypersensitive to anything which blocks the sebaceous glands The dry-skinned worker is affected by degreasing agents but can tolerate oils , the hyperidrotic is irritated by water-soluble chemicals

Prevention should thus begin in the department of the works chemist, who can say what chemicals the workers are going to encounter ; by discussing with him, and seeking the cooperation of the workers in experiments the medical officer can form an idea of what chemical antidotes will be effective At this stage, Mumford considers, the doctor should be able to approach a reputable firm of druggists, stating the chemical and dermatological problem and suggesting an agent to meet it , the druggists would then make up a preparation which could be tested in the factory, reported on and modified until it gave satisfaction, and resulting statistics should be the common property of the industry Industrial dermatitis is thus one example of a case in which workers, employers and works chemist could join with the medical officer in exploring the health deficiencies and opportunities of the factory There is good reason, too, for those who teach industrial medicine and those who practise it to meet often and pool their knowledge

---

[2] Dennis C *Arch Surg* 1941 43 1021

[3] See *Lancet* 1942 i 662

[4] P. B *Practitioner* 1942 148 288

Annotations

WORSER DOCTORING ?

Sir Kay Le Fleming told the Dorset Cine League a few days ago that more than 70 of the 200 prewar practising doctors in the Bournemouth/Poole/Wimborne area had joined the Services and 50 more were required in the near future That reduced number could not give the civilian population the standard of medical attention to which they were accustomed and he thought that in fairness to the doctors the Minister of Health should make a public announcement to that effect Probably the prewar standard in Bournemouth, Leamington and Harrogate was higher than that in Bradford, Leeds and Hull, at any rate the number of doctors per head of population was larger But the position is serious enough in many parts of the country and has given a peripatetic correspondent this week food for thought on the relative values of peace time and wartime And it is a common grievance among busy doctors that call-up of maids and reception clerks has slowed their professional pace and made inroads on the time they were wont to spend on patients If the civilian has to tighten his belt and become more meagre in physique, should he not be content to see his doctor less often, which would often mean in effect waiting to get pretty bad before he calls him in at all ? It is however a little difficult to believe that it has come to that yet Mr Ernest Brown, explaining the position last week to local medical war committees, described the demand of the Services as urgent but added that a scheme to eliminate overlapping is being considered In hospitals men who were fit for service abroad would be replaced by women and by men who were not It is common knowledge—or is it more than common gossip ?—that there are still many doctors who are not doing so much as they would like This is no doubt the proper construction of Dr Gordon Ward's naughty story in the *Times* of June 1 The terms registered and unemployed must now be regarded as incompatible When every doctor is working to capacity will be time enough to see if qualification of new ones can be speeded up There seems no great harm in Aberdeen students forgoing part of two long summer vacations, though these have been used in the past for general culture or for making ends meet, and the English Conjoint Board has only slightly juggled with dates But the Ministry's suggestion to the General Medical Council is of a more drastic measure and was met by the very proper rejoinder "It is for the Privy Council to direct and in any case the licensing authorities can do as they please"

HOSPITALS IN THE UNITED STATES

DURING 1941 hospital facilities in the United States grew by the equivalent of one 269 bed hospital for every day of the year, patients were admitted at the rate of one for each 2 7 seconds night and day, and with no time off for Sundays or holidays, but they remained there in the aggregate 58,339 years less than in 1935 Such statistics may be culled from the results of the twenty-first annual census of hospitals carried out by the Council on Medical Education and Hospitals of the American Medical Association[1] For those who like their figures put more soberly this report shows that in 1941 the USA had 6358 registered hospitals with more than 1¼ million beds During the year just 11½ million bed patients were admitted As the lation of the USA at the 1940 census was close on millions these figures show an overall provision of 1 per 100 persons and an entry rate of 1 for each 11 ants (some people will of course enter more than the real ratio must be smaller than 1 in 11) The stay per patient in the general hospitals, which 92% of the patients, was 12 days compared with 14 in 1935, though whether the fall is due to recovery or to changing types of entries is Beds in the main types of hospitals are 1 to 250 for general hospitals, 1 to 200 for nervous and 1 to 1600 for tuberculosis and 1 to 1900 for hospitals and other types Division by control show that 29% of the hospitals with 73% of the total beds were functioning under federal, state or local government, 46% of the hospitals and 23% of the beds were privately run under non-profit organisations, and 25% of the hospitals with only 4% of the beds were under proprietary control A question asked in the census *for the first time was the number of patients operated* on, the answer being some 5 millions, or 45% of the patients admitted In 1941 4 4% of the patients admitted died in hospital Post mortem examinations were done on a quarter of them

[1] *J Amer med Ass* 1942, 118 1053

VITAMINS AND MIND

Wortis[1] has pointed out that thiamine, nicotinamide and riboflavin are all concerned with carbohydrate metabolism, thus a deficiency in any one of them may hinder the proper functioning of the brain by interfering with the utilisation of dextrose, its essential foodstuff These, however, are only three factors, and many other enzymes have been detected in the brain Of the clinical syndromes found to be associated with vitamin deficiency, particularly a deficiency in thiamine, one of the commonest is a neurasthenic state, with loss of sleep and appetite, vague headache and other pains, easy fatiguability, and difficulties in concentration and recollection Jolliffe and his colleagues[2] were able to produce such a state experimentally by giving a diet with only 60% of the normal thiamine requirement, and symptoms and signs came on as early as the fourth or fifth day In another study O'Shea and Elsom,[3] using elaborate methods of psychological testing, showed the principal psychological deficiency in this state to be a deterioration in foresight and judgment, general intelligence and speed of hand-muscle coordination showed no measurable impairment Symptoms rapidly improved with administration of thiamine or the vitamin B complex The clinical picture of the syndrome can be very varied, it seems, and since it may develop in apparently well nourished people and may even respond to some extent to psychotherapy, the difficulties of differential diagnosis from a purely psychogenic syndrome are considerable Association with vitamin-B deficiency has been demonstrated in other important syndromes, notably the neurological disorders of alcoholics Peripheral neuritis, Wernicke's syndrome and the Korsakow syndrome are the more important examples, and it appears, on both experimental and clinical evidence, that delirium tremens can aid in the production of a deficiency state but is not itself produced by it Deficiency of nicotinic acid and its amide, the specific cause of pellagra, may also produce a variety of psychiatric pictures, neurasthenic states are common and can proceed to loss of memory, disorientation, confusion and confabulation If treatment is begun early the results are satisfactory, but in neglected cases permanent impairment of memory d irreversible dementia can result Cleckley and his lleagues[4] have reported on 19 stuporose patients who re suffering from acute pellagra although none of the ysical signs were present, and Jolliffe and others[5] scribe 150 cases of an encephalopathic syndrome which ey believe to be caused by nicotinic-acid deficiency e clinical picture was characterised by clouding of nsciousness, cog-wheel rigidity of the extremities, and cking and grasping reflexes, a fatal outcome was ual A somewhat similar case was recently reported y Slater[6] for the first time in England These facts are allenging, and further research is clearly needed It is teworthy that in the early descriptions of pellagra any of the symptoms were regarded as neurotic The inical picture is such that patients suffering from tamin B deficiency may easily be misdiagnosed and luable time lost in treatment, they are much more kely to be found in general medical, surgical and ynæcological wards than in psychiatric departments or spitals Patients suffering from neuritis, chronic brile conditions, pernicious anæmia, hyperemesis avidarum, gastric ulcer and a variety of other organic mplaints are particularly liable to develop syndromes f this kind Further investigation of the symptoms nd pathological changes produced by these deficiency tates may provide us with a clue to the origin of similar ymptoms in patients not suffering from any known ietary deficiency, and we may be on the brink of iscoveries about the physical basis of so called functional disorders which may revolutionise the further evelopment of psychiatry

---

[1] Wortis, H *Psychiat Quart* 1941, 15, 693

[2] Jolliffe N Goodhart, R Gennis J and Cline, J K *Amer J med Sci* 1939 198, 198

[3] O Shea H, O'Shea Elsom, K and Higbe R V *Ibid* 1942, 203, 388

FRUSTRATION OF MEDICINE

MANY of the known causes of ill health are at present beyond the control of the individual doctor, but that does not mean that they must remain uncontrolled It may be difficult to point to the exact cause of ill health in individual patients, yet we know that in the aggregate faulty nutrition and unsatisfactory living and working conditions produce much disease that could be prevented It is in this sense that the medical profession may be said to be frustrated as Mr Aleck Bourne pointed out at a meeting of the Socialist Medical Association on May 30 We have regarded health as the absence of obvious disease for so long, he thinks, that many people have never experienced that positive feeling of well being which is health So long as physical ill health is tolerated, and the known causes of many diseases are allowed to operate our civilisation must be incomplete He recalled that, in 1935, 62% of Army recruits were rejected on physical grounds, although the standard was not a high one, 1 in 34 militia applicants aged 19, examined in 1939, had no teeth at all, each year 1 person in 820 develops tuberculosis, and this is still the chief cause of deaths between the ages of 10 and 40, and of nearly half the deaths among women aged 20–25, in 1938, 62,000 persons died of notifiable diseases (13% of all deaths in that year), maternal morbidity affects 1 in 9 of all childbearing women and the stillbirth wastage is 3 3% of total births Even in curative medicine overlapping and gaps in the available services, inadequate facilities for diagnosis and treatment, and long hospital waiting lists reduce the scope and efficiency of the medical services He attributed this frustration to lack of public responsibility for the preservation of health Dr D Stark Murray felt that the primary object of medicine is defeated if a doctor, no matter how many cures he can count to his credit, has to deal with a single case of preventable disease Public health authorities suffer as much as private practitioners, because they never deal with the whole problem of health their service can be neither preventive nor curative The treatment of tuberculous patients is often invalidated by economic circumstances after their discharge from sanatoriums, and the incidence of venereal disease is greater than need be because it is not treated as an ordinary infectious disease and isolated He regretted, too, the lack of coördination in research, and the failure to use known results thus seven years after the cause of pellagra was discovered, the disease was still rife in the Southern States of America, because, for economic reasons, cotton was the only crop raised and owing to the low price of cotton the people lacked a proper diet, then a slump came in the cotton industry, a mixed crop was sown, more food became available and pellagra decreased But when the trade recovered only cotton was grown again and the cases of pellagra multiplied One of the tasks of medicine, he felt, is to ensure that what we know about health is fully understood and used

INFECTIONS OF THE HAND

THE average practitioner spends his life collecting impressions of the value of this or that line of treatment The sum total he calls experience But he rarely has time to weigh up carefully the many factors that influence the course of disease Mason and Allen[1] of Chicago have tried to assess these factors in relation to infections of the hands in 250 cases from the Passavant Memorial Hospital They recognise that the virulence of the infective organism and the resistance of the host are variables not easily assessed But they set out to show that after the inception of the infection much damage can be done by secondarily introduced infection, and by trauma to the tissues It is not generally realised how easily an infected finger can be made worse by rough handling, squeezing, premature and incorrect incision Only 10% of the cases they studied revealed no factor in treatment that could call for criticism The whole study is humiliating and is rendered more poignant by arresting caricatures of what not to do In short do not squeeze, do not steep in hot lotions, do not cauterise, avoid all amateur attention but treat with complete asepsis (including mask) at all inspections, employ gentle and carefully planned surgery at the proper time, under hæmostasis and complete anæsthesia and thereafter avoid contamination at all costs

THE LUFTWAFFE AND AVIATION MEDICINE

DEVELOPMENTS in aircraft construction and performance have meant that in many operational types now in use by the chief air forces the limits of human adaptability to the effects of height, turning and acceleration are often approached and sometimes exceeded The problem of helping the aviator to adapt himself as far as possible to these abnormal conditions is a vital concern of the medical branches of the air forces since superior adaptability may well mean advantage over the enemy Prof V E Henderson has given us some insight into German views on the subject by translating the "Medical Guide for Flying Personnel"[2] written for the Luftwaffe in 1939 This booklet is meant for the medical officer as well as the flying men themselves The first section deals with high flying, oxygen-lack and altitude sickness, protection against cold, and the vital importance of excluding carbon monoxide from the cockpit Then comes a discussion of the effects of acceleration and centrifugal force Examples illustrate the protective value of padding and helmets and the part played in the production of "black-out" by the increased weight of the blood and consequent fall of blood pressure in the arteries of the retina and brain is emphasised, an ingenious diagram shows how the effects can be minimised by bending the head forwards and downwards The third section deals with the sense organs, eyes and ears The eye is regarded as the most important to the flier because "like an eagle, he must spy out his objective from great heights and must recognise his opponent as soon as possible," and because good eyesight is essential for landing, particularly crash landings, finally in "blind flight," it is the eye alone, through observation of the instruments, that can give the flier a correct estimation of his position in space and how he is flying Therefore every flier who can improve his eyesight by glasses is advised to use them when flying, even though they may not be needed ordinarily In contrast to the eye, the equilibrating organ of the ear can and does give rise to various illusions about the pilot's position in space and the way his aircraft is flying, these illusions are described and explained Finally there are short sections on hygiene, sport, medical examination and the relations between the airman and the medical officer These problems are, of course, the same for all and have been thoroughly studied in many countries The Luftwaffe point of view running throughout is that every advantage must be taken of the help medical science can give so as to get the maximum efficiency and thus superiority over the enemy, who perhaps is not so careful When ideal conditions from the flying man's point of view clash with fighting efficiency the latter must take precedence—for instance, the best way of resisting the high centrifugal forces of rapid turns is to lie flat on the back, but the fighter pilot cannot do this for if he "loses sight of the opponent for a moment he is lost" and the position is thought to be psychologically unfavourable to the fighting spirit This principle is especially emphasised in the case of oxygen and it is laid down that oxygen must always be used over 4500 metres (14,000 ft) With regard to alcohol the standpoint taken is that moderate use "aids in the development of comradeship in our Nordic somewhat reserved men," but it must be moderate and it is forbidden for 8 hours before high flights The sports most favoured are skiing and swimming, track sports are frowned on as leading to overtraining Our Secretary for Air, in a recent newspaper interview, supported the necessity of having an MO to every squadron who will get to know his men and be able to detect the first signs of being "flown out", the Luftwaffe take the same view and their manual says truly that the MO who neglects this side of his work is not a true air-force doctor The really notable omission is night flying which is hardly mentioned at all, nor is the problem of aero otitis referred to Under present conditions the training course given to the newly joined RAF medical officer is brief and much of the time has to be spent on details of administration Armstrong's volume on aviation medicine lays much emphasis on matters not of immediate interest to such an officer, and it is a large book The small German booklet gives succinctly a mass of necessary and practical information not to be found in any other generally available publication, it should be studied by every doctor who is going into the RAF and may well be useful to many already in

---

[4] Cleckley H M Sydenstricker V P and Geeslin, L E J Amer med Ass 1939 112 2107

[5] Jolliffe N Bowman K M Rosenblum, L A and Fein H D Ibid 1940 114 307

[6] Slater, E Brit med J Feb 21, 1942, p 257

[1] Mason M L and Allen H S *Quart Bull Nthwest Univ* 1942, 16 42

[2] By Heinz von Diringshofen Oberstabsarzt der Luftwaffe Translated by V E Henderson, 1940 Pp 102 From Oxford University Press 4s 6d

MORE USES FOR PYRETHRUM

One of the most widely known old-fashioned remedies for domestic pests is a preparation of pyrethrum powder which is simply scattered about where the insects will come in contact with it Intensive research by applied entomologists in many countries has given us some synthetic insecticides but has also proved how difficult it is to surpass the active principle contained in pyrethrum flowers Owing to restriction of supplies (Japan was a big grower) and considerations of shipping space, pyrethrum will not be generally available in this country during the war But in Africa supplies from Kenya can be used, and Symes, McMahon and Haddow[1] have in preliminary tests that a powder from waste fl and leaves is quite effective This dust is blown walls, floors and ceilings of native huts in the quantity 2 oz per hut, and gives good reduction of mosqu bugs, fleas, cockroaches and house flies The po loses potency on exposure, but one dusting lowers mosquito population for 30 days Symes and colleagues suggest that the powder will be useful to and military authorities for the reduction of ver native quarters, as a specific against loose fleas or lice plague, typhus and louse-borne relapsing fever as an antimalarial measure for the reduction of mosquitoes and as a check to the house-fly

MASS RADIOLOGY UNITS

We recently observed that no trouble should be spar to make the screen miniature a success, for economy time and of material are on its side[2] The Standin Advisory Committee on Tuberculosis has now taken th initiative in advising local authorities on the subje of orders for mass radiology units After consultatio with Lord Dawson, Brigadier D B McGrigor, Dr Cochran Shanks, and officers of the Ministry of Supply an Ministry of Health the committee has decided to recommend that, in view of the shortage of personnel an material, apparatus for mass radiography for the civilia population should be placed for the time being und the direction of the Ministry of Health At the sam time the highest priority should be given British manufacturers to provide, as soon as possible, sufficient sets apparatus, according to the specification of the technic subcommittee of the Tuberculosis Committee (M R C for investigation among the civilian population, i conjunction with the Services which are concerned in th examination of their personnel A minimum of 50 se of apparatus would be required within the next twelv months for these purposes

---

Sir Edward Coey Bigger, who died in Dublin las week in his 81st year, was a Free State senator an Crown nominee on the General Medical Council 1917–2 where his knowledge of medical education in Australi and Ceylon was of great value His report for th Carnegie Trust on the physical welfare of Irish mothe and children initiated a great welfare movement and h was chairman both of the Irish Public Health Counc and the Irish Midwives Board He qualified in 18 from Queen's College, Belfast and the London Hospita

Dr James Kerr Love, consulting aural surgeon t the Glasgow Royal Infirmary, died on May 31 in hi 85th year A friend of Helen Keller he did more tha anyone in his generation for the deaf-mute and his stud of the deaf child for the Carnegie trust became a cla

---

Dr F O MacCallum, of the Wellcome Bureau o Scientific Research, asks for material from suspecte cases of lymphocytic choriomeningitis The virus i detectable in the blood from the 3rd to the 10th day o the disease, and in the c s f from the 1st to the 10th da of the meningitis, which does not usually develop fo about 3 weeks Specific antibodies appear in the blood serum and reach their maximum 5–8 weeks after th onset Dr MacCallum wants blood or c s f taken unde sterile conditions while they are infective, 10 c cm should be collected, and the specimen should be at onc cooled and sent packed in ice so as to reach the Wellcom Laboratory (189–193, Euston Road, N W 1) within hours If neither blood nor c s f can be obtained durin these periods, two samples of blood-serum for antibod titration should be taken, the first as early in the diseas as possible, the second 5–8 weeks after its onset, 10 c cm of blood is desirable at each bleeding The serum shoul be kept cool but need not be packed in ice, no antisepti should be added

---

[1] Symes, C B , McMahon, J and Haddow, A J *E Afr med J* 1942, 18, 360

[2] *Lancet*, 1942, i, 297

Special Articles

GENERAL MEDICAL COUNCIL

PRESIDENTIAL ADDRESS

OPENING on June 2 the 155th session of the Council r H L EASON remarked "We are fortunate in being ble to sit once more in our own council chamber" He en alluded to the removal by death of two members the council and two former members Sir Henry rackenbury's long experience of private practice, his timate knowledge of the NHI Acts and their working, is powers of exposition, his mental and moral integrity, nd his devotion to public duty and public interest gardless of his own private interests, gave him an fluence and position in the council which were quite ceptional From Prof W H Gilmour's expert nowledge of dental administration and practice the ouncil had greatly profited Mr C F Rilot additional member of the council 1934–39, had been a diligent nd acceptable visitor of dental examinations, and his eports were of value in the revision of the dental urriculum News had just come in of the death of r Edward Coey Bigger a Crown nominee 1917–27, fter a long life of good service to the cause of public ealth Three recent members of the council had retired Dr Leonard Kidd, "Father of the Council," was not particularly vocal in plenary meetings, it was in committees and in personal communication with his fellow members that his long services on the council, and his experience in practice, were valued by his colleagues Prof E W Hey Groves, a member since 1936, had been compelled to retire owing to ill health To fill the vacancy the Royal College of Surgeons of England had nominated Surgeon Rear-Admiral C P G Wakeley With the retirement of Sir Arthur MacNalty the council would miss the benefit of long experience in the Ministry of Health and its predecessor the Local Government Board Sir Wilson Jameson's appointment in his place continued the tradition which began with the appointment of Sir John Simon in 1876

RECIPROCITY WITH QUEENSLAND

Members will have observed, the President continued, that part II of the Medical Act 1886 has been applied to Queensland with effect from Feb 1, and that the executive committee have recognised the medical degrees granted by the University of Queensland as entitling their holders to registration here We shall welcome this enlargement of our reciprocal relations under the act with states of Australia Not less welcome, the President added, will be the information received that by an Order in Council of Feb 9 the application of part II of the act to the Empire of Japan was revoked

SHORTENING THE CURRICULUM

In March the council received a letter from the Minister of Health commending to their consideration, in view of the definite shortage of medical man-power, a recommendation of the Medical Personnel (Priority) Committee in favour of considering, as a special war-time measure, the possibility of revising the medical curriculum, with particular reference to the clinical part of the course, so as to shorten the period of study This letter will be considered by the education and examination committees, sitting jointly There is nothing in the Medical Acts to support the view that a licensing body which shortens the medical curriculum infringes any statutory power conferred by Parliament on this council The duty of the council in relation to qualifying examinations is to secure the maintenance of a standard of proficiency required from candidates at such examinations which will be such as sufficiently to guarantee the knowledge and skill requisite for the efficient practice of medicine, surgery, and midwifery, and if at any time it appears to the council that the standard of proficiency required from candidates at the qualifying examinations held by any of the bodies is insufficient, it is their duty to make a representation to that effect to the Privy Council The Privy Council may thereupon, after considering any objections by the body or bodies to which the representation relates, by order declare that diplomas granted to persons on passing the examinations in question shall not entitle them to be registered under the Acts The ultimate decision therefore rests with the Privy Council and not with this council The council have never had power to impose upon the bodies a uniform curriculum Their resolutions in regard to professional education indicate for the information and guidance of the bodies what they regard for the time being as the normal minimum curriculum which is sufficient, but there are naturally at all times discrepancies between what is required of candidates by some of the twenty-seven bodies and what is required by others

POSTWAR HOSPITAL POLICY

The President then mentioned the appointment announced on March 26 of a departmental committee under the chairmanship of Mr W M Goodenough, to inquire into the organisation of medical schools, particularly in regard to facilities for clinical teaching and research and to make recommendations An invitation to the council to give evidence stands referred to the education and examination committees, who will no doubt provide a memorandum conveying the views which the council would desire to put before the committee In considering the position of the council in relation to both these communications from the Minister the President quoted some sentences from a letter sent by Sir Benjamin Brodie, the first president of the GMC to a college in February, 1859

He called attention to the fact that the Medical Council "is appointed by Parliament to act in those matters which affect the Medical Profession, both on the part of the Profession and of the Public It is not to be supposed that they have any interests of their own to serve Where they conceive that any alteration is required in laws concerning the profession, it is their duty to represent this in the proper quarter, not as petitioners, but as coadjutors of the Government in one department of the public business"

The position of the council said Mr Eason, has not varied since Sir Benjamin Brodie wrote this letter The council are always prepared to endeavour to assist the Government in any way in matters relating to the medical profession and the public interest to the full extent of the powers entrusted to them by the Medical Act of 1858 and by subsequent enactments

PRESS PUBLICITY

During our November session some London daily newspapers published interim reports of certain penal cases before we had ended our consideration of them If I explain why such publication is not countenanced by the council we may feel assured the incidents will not recur The council are not concerned with any risk of legal proceedings against themselves which publication of such matter by others might be thought to entail They are concerned solely with its effect on the practitioners who come before them Grave injustice may be done to a practitioner if parts of the hearing of a charge against him are reported before it can be known whether the charge is proved or not proved, and should it be proved what view the council take of its seriousness, and also if owing to the exigencies of space the early stages of the proceedings are reported, but not the decision of the council I am personally satisfied that the admission of representatives of the press to our public deliberations, which has been the policy of the council since 1864, is a good thing not only for the profession but also for everybody who pays attention to the admirably fair reports which are generally given of our work, both educational and disciplinary I am anxious, therefore, to treat as lapses due to oversight, and to inability to consult the notice regularly exhibited on the door of the press and public gallery on these premises, the departures from the normal good understanding between the press and the council to which I have felt bound to allude But I am sure I have the council with me in making it clear that should this remonstrance, which I make in the interest of members of the profession who are entitled to considerate treatment, be shown by experience to be ineffective the council must hold themselves free to restrict the ample measure of publicity now given by them to their proceedings in penal cases

---

" . To cover a burned area with chemical or coagulating solutions without first using every effort to transform it into a clean wound seems to us an inexcusable disregard of fundamental surgical principles"—Harvey S Allen and Sumner L Koch of Chicago, *Surg Gynec Obstet* 1942, 74, 914

SANATORIUM AND AFTER

WHEN a patient, suffering from tuberculosis of the lungs, returns home after having had a long period of sanatorium treatment, he is not cured in the sense that a man who has had appendicitis or pneumonia is cured He has, so to speak, been placed in a winning position as regards his disease whereas before he went away he was losing He must still lead a careful life and keep under medical supervision While away he has probably been doing graded exercises or a few hours gardening or carpentry, but nothing comparable to work in everyday life

On his arrival home he is likely to find that his income has been reduced to the NHI disablement benefit and so in order to maintain himself and family he has either to return to his ordinary work or else to go on public assistance Too often he chooses the former for there is a stigma attaching to the latter and its scale of relief is very low Now the majority of returned patients are not well enough to resume full-time work at once, moreover, at work they are unable to observe the routine of rest times learned in sanatorium and, in addition, they have the tiring journey to and from the place of employment As a result, after a varying interval some have a relapse and treatment has to be started over again Thus months of expensive and skilful sanatorium treatment are thrown away for the want of some provision for the patient during the first year, or possibly two years, after his return home

Various attempts have been made in this country to solve this problem and the village settlements and industries of Preston Hall and Papworth, and more recently those of Notts and Cheshire county councils, are noteworthy but the number of patients employed in these places is small compared with the size of the problem One of their chief difficulties in peace-time is to find a market for their goods, just as it is difficult, when the supply of labour exceeds the demand, for an individual tuberculous patient to find employment in ordinary industry Both these difficulties have been removed by the war and now we find the settlements unable to house enough labour to meet the contracts they can obtain, while the individual is tempted to work long hours by the offer of high wages in ordinary industry At the same time the Government has displayed interest in the employment of tuberculous patients by including them among the beneficiaries of the Ministry of Labour's interim scheme Perceiving the opportunity offered by the state of the labour market and appreciating the Government's interest in the matter the Tuberculosis Association discussed the problem at a recent meeting and appointed a committee[1] to inquire further and report

For our present purposes this committee suggests grouping tuberculous people (after sanatorium treatment) under three heads

(1) Those with a positive sputum who cannot work with them this memorandum is not concerned
(2) Those with a positive sputum who can do a certain amount of work
(3) Those with a negative sputum whose disease is quiescent who are employable

Patients in group (3) may either undertake half-time work in ordinary factory shops or part-time work in groups in special sections of factories Both these proposals provide a period of sheltered employment before they return to full-time work There appears to be no unsurmountable difficulty in providing half-time work, especially if the patients attend in even numbers so that half of them work the morning shift and the others the afternoon Some control might have to be exercised in the factory to ensure that they did not work for longer hours, this could best be arranged perhaps by giving them work in factories where trade unions are strong Group work in special sections of factories which could be arranged in the larger concerns opens up the possibility of adjusting the patient's working hours to his capacity He will only work for the number of hours which the tuberculosis officer in consultation with the employer considers suitable, with the prospect of a return to full-time work in course

Payment by the employer will be on an hourly but since the income from this part-time work insufficient to maintain a healthy standard of wages must be subsidised by some outside This is an essential part of the project Local ties through their public assistance committees have certain powers in this direction, but these imperfectly understood and rarely used Actually do now subsidise the wages of their patients who working in village settlements Furthermore, the Medical Officer to the Ministry of Health in his report of 1935, discussing the tuberculous ex wrote "He must live in as healthy an enviro practicable and his labour may need to be in order that he may maintain his dependents and self" There is thus both good precedent and precept for the innovation

Patients in group (2) might be provided with w at the larger sanatoria The committee has in m the establishment of simple light industries, not requi complicated machinery or power, orders being obta by subcontractors in consultation with the Mini of Supply.

The size of the problem is difficult to estimate 1937 there were 122,135 adult patients with tubercu of the lungs on the dispensary register for England Wales, probably there are rather more now Sh the schemes for examining large numbers of work-pe by X rays mature in the near future, as seems lik many more young people will become eligible for graduated return to full work Any figure sugge now would be guess-work and be likely to be profou modified by the adoption of mass radiography would in fact be unreasonable to search out the e cases without at the same time making provision the economic employment of the patients so discove

---

[1] The committee consists of Dr F R G Heaf, Dr G T Hebert (ex officio), Dr L E Houghton Dr G Gregory Kayne, Dr N Lloyd Rusby and Dr A S Hall (convener)

MEDICAL MAN-POWER

THE Minister of Health and the Director General Army Medical Services addressed a meeting of lo medical war committees on June 4 at BMA House

Mr ERNEST BROWN paid a tribute to the valua service rendered by these committees, which operated continuously since the outbreak of war Th members, serving in an honorary capacity, had difficult and invidious task of supplying the names practitioners for service with the Forces and in so do of safeguarding the adequacy of the medical service av able for civilian needs Their task inevitably grew m difficult as time went on, and the exigencies of military situation now required, during the next months, an acceleration of the withdrawal of civil practitioners for the Services He was sure that committees would face this further demand upon th with the zeal and good will which had characterised th work in the past

CIVILIAN ECONOMIES

This urgent demand could not be met, Mr Brown c tinued, without special arrangements It would necessary to curtail the period during which under pres arrangements newly qualified practitioners remain hospital appointments Their place would have to taken by women practitioners, and by male practition who are not liable for service under the National Serv Acts, on the ground of age, nationality, or medical fitn Larger hospitals were to be urged to undertake specia work for smaller hospitals and so release for the Servi specialists at present retained in the smaller hospit It would be necessary for part-time medical officers hospitals to undertake a greater share of the work so to reduce the number of whole-time staff and there release members of the staff for the Services There w scope too for economies in the staffs of medical scho and research establishments These measures follow recommendations by the Medical Personnel (Priori Committee under the chairmanship of Mr Geoff Shakespeare, M P, at whose suggestion he had submitt to the General Medical Council a proposal that th should be some curtailment of the period within wh medical students can become qualified

Finally, Mr Brown referred to a scheme now under sideration by the Central Medical War Committee, consultation with the Ministry and the National sociation of Insurance Committees, the object of which s to make the most economical use of medical manwer by eliminating overlapping in the work of general actitioners This scheme would depend for its success on the readiness of practitioners to participate in it lowing the high tradition of the medical profession for blic service he was confident that they would do their most to make it a success

ARMY'S SPECIAL INVESTIGATION

Lieut General ALEX HOOD explained how medical tablishments in the Army were formulated and how e various types of medical units necessitated an establishment to fit in with the rôle each type of unit was pected to carry out in the field He pointed out the thod by which establishments were kept down to an solute minimum compatible with efficiency, they re constantly under review in the light of experience ined from all theatres of war He gave examples of ere it had been possible to economise in personnel in e replacement of medical officers by non-medical ficers in certain units A committee consisting of ctors experienced in Army medical administration and f business men experienced in Army offices had carried t a special investigation into medical documentation n order to cut down paper work to a minimum, this would contribute further to economy in medical officers e primary duty of the medical officer was to keep e largest number of fit men at the disposal of the mmander

General Hood paid tribute to the work of the local edical war committees The medical profession were rous that the men in the field should have the most ficient medical service this country could produce, f further demands were made on the civil profession they would, he knew, respond to their maximum effort

In England Now

A Running Commentary by Peripatetic Correspondents

IN the past consultants have generally been recruited from among the more intelligent of each generation of medical students There can, of course, and always have been plenty of notable exceptions—you may be one of them—who for one reason or another preferred or, at any rate entered general practice But on the whole, those with the greatest energy and ability have tended to become consultants or specialists of some kind and the remainder, consisting for the most part of the honest hodmen of medicine, have become general practitioners In a world of unequal ability there is nothing wrong in that It is right and proper that when a second opinion is required the consultant called in should have not only special knowledge and experience but also superior mental gifts In the medicine of the not far distant future when some nine-tenths of the population are to be compulsorily state-insured, the present modus vivendi of the consultant will have to undergo a profound change Whether he likes it or not, it looks as though the consultant will have to work on a whole-time or part-time salaried basis The advocates of state medicine say, wrongly I think, that the consultant should not be looked on as the intellectual superior of the general practitioner, but rather as one who has preferred to acquire a little special, rather than a good deal of general, medical knowledge, and both are to be paid on the same scale But it is among the consultants that we want to find the best brains and I want to know how we are to ensure that the most competent and appropriate young men and women entering the profession will be moved in sufficient numbers to take up consultant work Special interest in a particular subject may be one incentive, but it is not enough, it may attract merely the most enthusiastic who are not necessarily the most able What other baits can we offer ?

* * *

Italian prisoners of war give us a good deal of quiet amusement Our chief contact with them is at the hospital On the first occasion one of a party injured his foot at work, and since there was only one guard he made his own way to outpatients and quietly sat waiting to be seen Sister, who normally maintains the calm efficiency associated with all sister outpatients, swept out into the hall, gazed and was visibly shaken Probationers—not all of them, for some must be kept in support—were sent hurrying to the superintendent, to matron to the residents, and even for some unknown reason to the post-mortem room The telephone worked overtime, and the prisoner still sat calmly waiting But it all settled down, fortunately before the Home Guard and police had been called out, since the camp commandant assured us that there were many reasons why he would not escape, the chief being that he would now be thinking anxiously of dinner One story says that he was eventually taken home by a small girl travelling to a nearby village, but this may be rumour After this we grew used to their arrival at hospital, with the circular patches on the seats of their trousers which aren't patches at all but part of the trousers, for obvious reasons Plenty of stories have accumulated One consultant watched six of them climbing over the back of a lorry in the hospital courtyard, while the guard stood watching them Having counted them in, the guard tried to climb in too, but found all his equipment too much He struggled hard, but happily solved the problem by handing his rifle over to a prisoner for a while, reclaiming it after he was in Most of them seem amiable enough, but I did have one the other day who seemed a little sullen, perhaps because he had a PUO for which some surgeon had removed his appendix without removing the pyrexia Dragging a history out of him via an interpreter was a long and laborious task, and he grew a trifle indignant when the appendix cropped up I felt the honour of the profession was at stake, and countered by asking kindly if he had ever had Malta fever, which I felt evened the score a little He won in the end, for he still has his pyrexia

* * *

Conversation in our small ward-room seldom changes much—sex, pay and leave are the mainstays—but sometimes we fly to higher topics, the soul and immortality are not beyond our mental grasp The first lieutenant, once in China, upholds Confucius with occidental ardour Our precise navigator, who left the sea to teach physics, has a mystic faith in Marx The MO, a stern materialist, believes that not " at full fathom five " where " of his bones are coral made " is immortality to be gained, but beyond the five hundred fathom line where geology tells us there is no slowly falling sediment, and bones lie bare throughout the ages, save for an occasional heavenly shower of meteor dust

An MO's duties are light but varied Diagnosis in northern latitudes is made more difficult by a thermometer that influenza can rarely warm above 97° F ; the roar of sea, wind and turbines drowns any crepitations, and even inspection presents a problem with a patient swaying wildly to and fro in his hammock Treatment on the other hand is simple a short period of rest in wet clothes in a wet hammock has never failed to cure Non-medical duties include censoring, wine-catering, editing the gazette acting as ship's librarian and playing centre-half at football Fortunately for over-rested muscle the W-plan has been adopted, which means " nought save defence " for the centre-half, a large bruise in the vicinity of the right external peroneal nerve of another ship's centre-forward shows there still is an offensive spirit behind the defence The great festivals of our Church have entailed extra work On the basis of a prewar visit to Moscow, Christmas morning was spent in reddening the ward-room for a visit from a Russian commodore The letter B flag (International Code) with a sickle-shaped spanner and hammer imposed on it by the yeoman of signals, and a newspaper picture of " Old Joe " enshrined in red, formed a central, decorative and much appreciated icon Easter saw the steriliser filled with eggs and aniline dyes, introducing a rude northern custom to many of our Pompey-manned ships Ascension day is still to come, it must not be left to Axis mine or torpedo to celebrate it for us

* * *

Aptitude tests for the Navy, Aptitude tests for the Army, Aptitude tests for the RAF, And so say all of us

SANATORIUM AND AFTER

WHEN a patient, suffering from tuberculosis of the lungs, returns home after having had a long period of sanatorium treatment, he is not cured in the sense that a man who has had appendicitis or pneumonia is cured He has, so to speak, been placed in a winning position as regards his disease whereas before he went away he was losing He must still lead a careful life and keep under medical supervision While away he has probably been doing graded exercises or a few hours gardening or carpentry, but nothing comparable to work in everyday life

On his arrival home he is likely to find that his income has been reduced to the NHI disablement benefit and so in order to maintain himself and family he has either to return to his ordinary work or else to go on public assistance Too often he chooses the former for there is a stigma attaching to the latter and its scale of relief is very low Now the majority of returned patients are not well enough to resume full-time work at once, moreover, at work they are unable to observe the routine of rest times learned in sanatorium and, in addition, they have the tiring journey to and from the place of employment As a result, after a varying interval some have a relapse and treatment has to be started over again Thus months of expensive and skilful sanatorium treatment are thrown away for the want of some provision for the patient during the first year, or possibly two years, after his return home

Various attempts have been made in this country to solve this problem and the village settlements and industries of Preston Hall and Papworth, and more recently those of Notts and Cheshire county councils, are noteworthy but the number of patients employed in these places is small compared with the size of the problem One of their chief difficulties in peace-time is to find a market for their goods, just as it is difficult, when the supply of labour exceeds the demand, for an individual tuberculous patient to find employment in ordinary industry Both these difficulties have been removed by the war and now we find the settlements unable to house enough labour to meet the contracts they can obtain, while the individual is tempted to work long hours by the offer of high wages in ordinary industry At the same time the Government has displayed interest in the employment of tuberculous patients by including them among the beneficiaries of the Ministry of Labour's interim scheme Perceiving the opportunity offered by the state of the labour market and appreciating the Government's interest in the matter the Tuberculosis Association discussed the problem at a recent meeting and appointed a committee [1] to inquire further and report

For our present purposes this committee suggests grouping tuberculous people (after sanatorium treatment) under three heads

(1) Those with a positive sputum who cannot work with them this memorandum is not concerned
(2) Those with a positive sputum who can do a certain amount of work
(3) Those with a negative sputum whose disease is quiescent who are employable

Patients in group (3) may either undertake half-time work in ordinary factory shops or part-time work in groups in special sections of factories Both these proposals provide a period of sheltered employment before they return to full-time work There appears to be no unsurmountable difficulty in providing half-time work, especially if the patients attend in even numbers so that half of them work the morning shift and the others the afternoon Some control might have to be exercised in the factory to ensure that they did not work for longer hours, this could best be arranged perhaps by giving them work in factories where trade unions are strong Group work in special sections of factories which could be arranged in the larger concerns opens up the possibility of adjusting the patient's working hours to his capacity He will only work for the number of hours which the tuberculosis officer in consultation with the employer considers suitable, with the prospect of a return to full-time work course

Payment by the employer will be on an hourly but since the income from this part-time work insufficient to maintain a healthy standard of wages must be subsidised by some outside This is an essential part of the project Local ties through their public assistance committees have certain powers in this direction, but these imperfectly understood and rarely used Actually do now subsidise the wages of their patients who working in village settlements Furthermore, the Medical Officer to the Ministry of Health in his report of 1935, discussing the tuberculous ex wrote “ He must live in as healthy an environment practicable and his labour may need to be subsidi in order that he may maintain his dependents and hi self ” There is thus both good precedent and g precept for the innovation

Patients in group (2) might be provided with w at the larger sanatoria The committee has in m the establishment of simple light industries, not requir complicated machinery or power, orders being c by subcontractors in consultation with the Minis of Supply

The size of the problem is difficult to estimate 1937 there were 122,135 adult patients with tubercul of the lungs on the dispensary register for England a Wales, probably there are rather more now Sho the schemes for examining large numbers of work peo by X rays mature in the near future, as seems like many more young people will become eligible for t graduated return to full work Any figure suggest now would be guess-work and be likely to be profound modified by the adoption of mass radiography would in fact be unreasonable to search out the ea cases without at the same time making provision f the economic employment of the patients so discovere

MEDICAL MAN-POWER

THE Minister of Health and the Director General Army Medical Services addressed a meeting of loc medical war committees on June 4 at BMA House

MR **ERNEST BROWN** paid a tribute to the valuab service rendered by these committees, which ha operated continuously since the outbreak of war The members, serving in an honorary capacity, had th difficult and invidious task of supplying the names practitioners for service with the Forces and in so doi of safeguarding the adequacy of the medical service ava able for civilian needs Their task inevitably grew mo difficult as time went on, and the exigencies of th military situation now required, during the next fe months, an acceleration of the withdrawal of civilia practitioners for the Services He was sure that th committees would face this further demand upon the with the zeal and good will which had characterised the work in the past

CIVILIAN ECONOMIES

This urgent demand could not be met, Mr Brown co tinued, without special arrangements It would b necessary to curtail the period during which under prese arrangements newly qualified practitioners remain i hospital appointments Their place would have to b taken by women practitioners, and by male practitione who are not liable for service under the National Servi Acts, on the ground of age, nationality, or medical fitnes Larger hospitals were to be urged to undertake speciali work for smaller hospitals and so release for the Servic specialists at present retained in the smaller hospital It would be necessary for part-time medical officers hospitals to undertake a greater share of the work so to reduce the number of whole-time staff and thereb release members of the staff for the Services There wa scope too for economies in the staffs of medical schoo and research establishments These measures followe recommendations by the Medical Personnel (Priorit Committee under the chairmanship of Mr Geoffre Shakespeare, M P, at whose suggestion he had submitte to the General Medical Council a proposal that the should be some curtailment of the period within whic medical students can become qualified

---

[1] The committee consists of Dr F R G Heaf, Dr G T Hebert (ex officio) Dr L E Houghton, Dr G Gregory Kayne, Dr N Lloyd Rusby and Dr A S Hall (convener)

QUESTION TIME

Hours of Work for Juveniles

r Rhys Davies asked the Minister of Labour if he ld consider granting powers to local education committees iquire of young persons when registering at 16 years of age ther they were employed for long hours in violation of the tory Act so that such information might be conveyed to factory inspectorate —Mr Bevin Arrangements have ady been made for local education committees to send iculars to factory inspectors of cases coming to their notice he course of the follow-up of registration where boys or under 18 are working for excessive hours and proving too ig It would not be possible for the education committees to stigate the question whether the hours are in violation of Factory Acts

eplying to Mr Kenneth Lindsay, Mr Bevin said he had ced the hours in all sorts of directions where his attention been called to cases, and he had the matter constantly ler review

Delayed Burial

Ir Bowles asked the Home Secretary why the body of lance-corporal in the Auxiliary Territorial Service, whose e and particulars had been supplied to him, was kept m April 7, the day of death, until May 27, before a burial er was issued, whether he had taken any steps and, if so, at steps, to ensure that there shall never be any recurrence case where the body of any member of the Services or of public should remain unburied for so long —Mr H. Morri- replied I have made inquiries and I find that this death s reported to the coroner on April 10 by the authorities of hospital in which it occurred with a view to the investiga- n of the question whether death might be due to some form poisoning The coroner ordered a post mortem examina- n by a pathologist, thinking that possibly such an examina- n might render an inquest unnecessary, and, pending the ept of the pathologist's report, he took the view that he s not authorised to allow the body to be buried, as the stion whether an inquest should be held was still ded, and there was a possibility that the pathologist ght want to see the body again. The pathological investiga- n proved difficult and the pathologist's report was not ceived until May 23 The coroner was, I think, wrong in case in not opening an inquest, adjourning it pending the ept of the pathologist's report and issuing the authority for rial. I have caused him to be so informed.

Alternative Model Budgets

Mr Mander asked the Parliamentary Secretary to the istry of Food if he would consider the advisability of lishing alternative model budgets which would be fully lequate from the point of view of health and would require nimum of imported articles with a view to saving shipping ce —Major Lloyd George replied My department deavours to give housewives advice on food in war time in e most useful form possible I am, however, advised that e publication of model food budgets would not be desirable view of the variations in the supply of particular commodi- s from time to time and in different localities Moreover, e variations in food habits as between different parts of the ntry, and the varying needs of individual classes of sumers, would greatly reduce the value of any budgets ich might be prepared.

Milk for Tuberculous Patients

Major Haden Guest asked the Minister of Health what cial arrangements were made for the supply of milk to ients in hospital suffering from pulmonary or other forms f tuberculosis —Mr E Brown replied Persons suffering m active tuberculosis whether in hospital or not are entitled priority supplies of milk. The term "active" is taken as aning "unhealed," and covers cases with artificial eumothorax in whom the disease is considered to be healed.

Women Students in Medical Schools

Mr F C R Douglas asked the Minister of Health whether would, in connexion with any reorganisation of the spital system, give consideration to securing the admission f women students into all medical training schools on equal ms with men —Mr Brown replied I will bring the ggestion to the notice of the committee which is considering e organisation of medical schools

Sleepy Sickness after Imprisonment

Mr W Dobbie asked the Home Secretary if he would cause an inquiry to be made into the cause of death of H Mitchell, of Rawmarsh, Rotherham, aged 17, who was sentenced to three months imprisonment under the Essential Works Order, was taken to Armley gaol after his sentence on March 5, returned to the municipal hospital at Rotherham on May 6 and died on May 14, before his sentence was completed, and would he arrange that, in future, when boys were tried under this order and sent to prison, investigations were made as to their physical condition and a medical examination made before they were sent to prison —Mr Morrison replied I have received full reports on this case In accordance with the normal arrangements Mitchell was medically examined on his reception into prison on March 5 and he was then reported to be in good health He first complained of not feeling well on May 2 and was at once admitted to the prison hospital His condition did not improve and on May 5 he was removed on the advice of the medical officer to Rotherham Hospital for examination. It was then found after laboratory investigation that the lad was suffering from an acute form of sleepy sickness, and though he was given expert treatment at the hospital, he died on May 14 I much regret that all the care devoted to this patient, both at the prison and the hospital, proved of no avail

Mr E Shinwell Does not this show how wrong it is to send boys of this age to prison under the Essential Works Order without at least conducting a medical examination ?—Mr Morrison That is not my responsibility Mr Shinwell It is the Government's Mr Morrison I am answering for the Home Office, but I have no reason to believe that the fact that this lad went to prison had a damaging effect on his health.

M R C Report on Pneumokoniosis

Mr O Peake, under secretary Home Office, told Mr James Griffiths that the recommendations in the report, which affect the Mines Department as well as the Home Office, are under active consideration, in consultation with the Secretary for Mines It is not yet possible, he said, to make any statement as to the action to be taken, but the urgency of the matter is fully appreciated Pressed about further delay, he added Although this inquiry has taken a long time the report was only published on May 16, and there have been other matters affecting the coal industry which have been the concern of the Mines Department since that date

Contraceptives in the Army

Mr I C Hannah asked the Secretary of State for War why official sanction had been given for the use of contraceptives in the Army, and would he reconsider his attitude in this matter —Sir James Grigg replied In the British Army, as in other armies, facilities are provided whereby soldiers who wish to do so may obtain preventatives against venereal disease I do not propose to withdraw these facilities

Chalk Boreholes for Sewage

Sir Francis Fremantle asked the Secretary of State for War whether he was aware that, in a camp now being prepared for troops in the home counties, it was proposed to discharge the sewage effluent direct by three boreholes in the chalk from which the water supply for the area was derived, why this proposal, which was opposed to modern sanitary engineering practice, had been proposed by the officers in the Service, and whether he would ensure that no such proposals were contemplated under his authority in future —Sir J Grigg replied In this case the Chief Engineer of the Command discussed the proposal with the local authorities They at first agreed to it, but on reconsideration objected and the proposal was therefore abandoned. Existing *instructions* on this subject enjoin special care where borings are made in chalk and lay down that in cases of doubt officers concerned should work in liaison with local health officers and municipal engineers

Sir F Fremantle suggested that the proposal should have come before the local water company, and Sir J Grigg said he would consider the point.

Imperial Cancer Research Fund —At a meeting of the council on June 4 Prof H R Dean was re elected chairman and Sir Cuthbert Wallace vice chairman for 1942–43 Dr L Foulds was re-elected Elizabeth Wills Allen Fellow and Dr R J Ludford Alice Memorial Fellow

The peripatetic who had some withering comments to make about those of us who kill the things we love will, I fear, be hard put to it to sublimate our disgusting instincts If one knew for certain that he had tried his hand at these cruel sports one would respect his opinion the more when he denounces them, needless to say it is to be hoped also that he is a vegetarian He who has had a crack at high driven pheasants or ridden a fast hunt and "lived" with a good pack of hounds and doesn't want to do either again deserves respect even though he may excite astonishment It is a sad thought that field sports may in themselves be a form of sublimation Thus a psychiatrist who hunts a pack of beagles assures me that killing hares helps him to refrain from killing his more trying patients, and I can well believe it When mankind has been purged of the desire to hunt it will be time to start on the so-called lower animals My spaniel friend Taffy, lame, blind and stricken in years, has just had to be put down Throughout his long and happy life his mind ran almost exclusively on rabbit and no doubt he is chasing celestial conies in the happy hunting ground at this moment Meanwhile his son carries on the terrestrial tradition It is all very disheartening and regrettable

* * *

My God, I believe I've got mumps It's 17 days since Bunny showed swelling, 10 since he said he wasn't feeling too good and I told him he was bone lazy. I had them 12 years ago and got hit below the water-line on the starboard side The psychologists are right—it's the threat of all threats, the threat of germinal extinction I am disintegrated with fear I am about six people One of them, Nosey, is already looking it up in the book "Mumps, see Parotitis," "Parotitis, see Epidemic Parotitis," blast these indexers Here we are—"second attacks are not uncommon" Callous brute, why can't he say, "We very much regret to announce that second attacks "? Dreamy, the imaginative one, is picturing my awful future, "You'll go all arty like Ruskin and be able to write 'The Seven Lamps of General Practice,' and the students will love your squeaky voice" Grumpy is blaming Bunny, Dopey is thinking out suitable forms of suicide, but Bossy is making a valiant effort to get the crowd together

For the hundredth time I go to the looking-glass Is there a swelling? I open my mouth wide Do I feel it? I am not sure May be a sort of pseudocyesis or a mild attack in a semi-immune I don't know

---

POSTGRADUATE COURSE IN INDUSTRIAL MEDICINE

The second series of postgraduate courses in industrial medicine arranged by the Faculty of Medicine of Sheffield University will be held during the two week ends, July 3–5, and July 17–19 Each course will begin at 2 30 p m on Friday and end on Sunday about noon Among the lecturers and demonstrators for the first course are Miss May Smith, D Sc, on "Sickness absence records and lost time in factories", Mr F W Holdsworth, M Chir, on "Back strain in industrial workers", Dr H A Krebs, on "Nutritional problems relating to industrial workers", and Mr Kenneth Mellanby, Ph D, on scabies Dr Richard Fawcitt will lecture on occupational lung diseases of agricultural workers and will demonstrate X-ray films illustrating the lesions A visit to a large steel works has been arranged, and the medical officer, Dr John Crook, will discuss leadloy steel and the methods used to prevent the onset of lead poisoning in the casting of the steel and in subsequent processes such as de seaming and rolling

During the second week end Dr A J Amor will lecture on chemical poisons in industry, Dr Rupert Hallam on "The diagnosis, prevention and treatment of industrial dermatitis, and rehabilitation of workers recovering from dermatitis", Mr T W McCullough on "Factory law in relation to health and welfare", and Dr W J Wellwood Ferguson on miners' nystagmus Dr C L Sutherland will give a demonstration on "Occupational lung lesions of coalminers" and Dr Ethel Browning will demonstrate and discuss "Industrial toxic anaemias" Mr E W Murray will speak on standards of lighting in factories The class will also visit a cutlery factory to study methods of dust control

Each course will be limited to 40 postgraduates, and early application should be made to the dean of the Faculty of Medicine, The University, Western Bank, Sheffield, 10

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS M P

THE Minister of Health and Lieut-General director-general Army Medical Service, have asked Central Medical War Committee for more doctors f Services But it would be easier for the profession a whole to appreciate the position if the Shak Committee's report on the allocation of medical between the Services, the EMS and the civil were published Unfortunately the Minister of when asked if he would publish the report last could only say that he would consider whether " abridged version" could be usefully prepared and pu lished It is to be hoped this will be done at an ear date. The committee over which Mr Geoffrey Shak speare, M P, presides is a representative one, includ officers representing all the Services, the EMS and th civilian services, and while detailed figures could not given it would be of great advantage for the medic profession and the public in general to know the principl which guide the CMWC when priorities are under con sideration Opinion in the Services is divided on th merits of publication, but what will help the war effo in this country can be separated from what will help th enemy

The medical profession is being called on to provid the personnel of a new service in connexion with th Government's plans for reorganisation of the minin industry, which will have been debated before the words are in print This is to be a Medical Consultativ Service for the mines, but it will not surprise the detache observer to read in the Government report on the Minin Industry named "Coal" that "the organisation of th service has yet to be worked out in detail" The genera aim of the service will be the appointment in each of th regions of the country into which the coal industry wi be divided of one full-time medical administrative office to control, coordinate and, where need arises, supplemen the "facilities available for the medical treatment c miners" This service will also deal with applications b miners for release from work in the mines on medic grounds In another part of the coal report it is pro posed that service as a coalminer shall be one of th options of men called up for national service It i clearly necessary that this new Mines Medical Servic should be organised with regard to both efficiency an economy of medical man-power, and further elucidatio of this point will no doubt be sought in the House

The recently published report by the Medical Researc Council on chronic pulmonary disease in South Wale coalmines indicates the great importance and grea complexity of the problems involved The need fo extension of facilities for rehabilitation on the line already found so successful at the rehabilitation clinic a Mansfield is another field of activity While a study o the morbidity of coalminers as compared with othe workers and district by district would give valuabl information, there are of course many other importan questions affecting the coalminer It is therefore to b regretted that in the Government's proposals for nationa control of the industry under a controller-general, actin for the responsible minister, no medical man is appointe as a chief officer The controller-general's staff wil consist of a production director responsible for efficienc and volume of production, a labour director responsibl for welfare, safety, health and working conditions an allocation of labour, a services director responsible fo distribution and allocation of coal, and a finance directo responsible for all financial arrangements The function of the labour director should be divided between medical man who would take over all welfare and healt questions—a director of hygiene in the Army Medica Service sense for the coal industry—and a director o labour who will have a very big field on the organisationa side of recruitment, maintenance, discipline and discharg and other questions The medical profession can do very valuable work for the mines industry and for th country, and make use of that great volume of goodwill knowledge and understanding which exists betwee miners and mine doctors, if they are given their du position of authority.

hough it is conceivable it may affect the dentine If, erefore, it is alleged that the consumption of wholemeal ead produces a calcium deficiency in adults, it should clearly explained in what way this is made manifest it expected that there will be, for example widespread emorrhagic predisposition?

According to the League of Nations technical comssion each individual on an average needs 1 gramme calcium per day, and the maintenance of the correct lcium phosphorus ratio, which however varies at fferent ages It is stated that about a third or so of e population of this country has not been getting ough calcium; but Sir John Orr gives this figure as out representing the proportions of the population ving below the subsistence level, whose deficiencies are arly of the foods containing minerals and vitamins is not therefore reasonable to select lack of calcium as a isolated or exceptional phenomenon and definitely late it to phytic acid Moreover, it should be remembered that the recommendation by the Medical Research ouncil in 1940 was in tentative terms and the proviso as made that bread treated with calcium should be so esignated in order that persons who did not wish to ave it could avoid it The action of the ministry is ot based on the advice of medical men, but on that of wo chemists attached to the ministry, although most hemists are against the method

But, indeed, there is no justification for tacitly assuming that any shortage of absorbable calcium in wholemeal bread is not easily remediable Milk and cheese are the best sources of calcium but, as Keeble points out, cabbages carrots onions and leeks contain adequate supplies and it should be remembered that shortage of meat, in which there is little calcium, automatically induces people to eat more of other foods containing more calcium Presumably in the belief that people will not consume enough of these, it is proposed to add chalk to bread Is there any evidence to show just how much of this inorganic salt is likely to be absorbed? An experienced clinical investigator believes that only an organic salt, like the lactophosphate is at all readily absorbed Moreover, the researches of C J McDougall (The Counteraction by fat of the anticalcifying action of cereals *Biochem J* 1938 32, 194) should surely not be ignored She found by experiments on rats that, with a diet containing a high proportion of cereals and relatively little calcium and vitamin D the so-called anticalcifying tendency of the cereals due to phytic acid is counteracted by the presence of 10% of lard or olive oil She offers the explanation that the absorption of calcium is promoted by the formation of calcium soaps with the fatty acids which thereby inhibit the formation of an insoluble compound of calcium and phytin

Sir William Bragg has stressed the value of accumulated experience in assessing the value of scientific truth Indeed, it is clear that sweeping generalisations based solely on laboratory experience which are not in accord with knowledge gained by the human race over many centuries cannot be regarded as tenable, and that dogmatic assertions which discourage the consumption of a food which is in many respects beneficial may fairly be described as the setting up of a bogy

[illegible] Street, W 1 NORMAN BENNETT.

HEREDITY IN PSYCHONEUROSIS

SIR,—I do not wish to appear ungrateful for your notice (*Lancet*, May 30, p 660) of my paper to the Royal Society of Medicine, but I am quoted as saying 'there was no significant difference between the incidence of mental abnormalities in parents of patients with an anxiety state and those of the control group' Actually one of the main points was that there was a significant difference in incidence of psychiatric abnormalities between the parents of all three psychoneuroses, and the control group The figures were 21% of parents of patients with anxiety state suffered from anxiety state 17% of parents of hysterics suffered from hysteria, 7 5% of the parents of obsessionals were obsessionals There was evidence of similar incidence among all the first degree relatives There was also evidence of relationship between depressive psychosis and the psychoneuroses, 2 7% of the second degree relatives of anxiety states suffered from depressions, 4 4% of the second degree relatives of obsessionals suffered from depressions, 7 5% of parents of obsessionals (not 70% as quoted in the review) suffered from depressive psychosis Finally I do not suggest that psychoneuroses occur by a shuffling of the factors responsible for normal personality but rather that these play a part with the environment perhaps together with a specific psychopathic factor common to all the psychoneuroses The work has been done for the Medical Research Council and you will appreciate that I am anxious that the wrong figures should not be accepted

Guy's Hospital FELIX W BROWN

CTAB

SIR,—In his letter of May 23 Mr Berry writes that since Zephiran, a comparable cationic detergent, is affected by protein it is reasonable to assume that 'Ctab' (cetyl-trimethyl-ammonium bromide) will be similarly affected Dr Barnes, in the *Lancet* of May 2 (p 531) observes that it is not clear why rubbing a granulating surface for a minute with a 1% solution of ctab completely fails to sterilise it In the course of some experiments on methods of testing disinfectants I have had occasion to verify Mr Berry's surmise and solve Dr Barnes's problem Like zephiran ctab is heavily inactivated by blood serum and other protein-matter, and in this respect is far from being an ideal antiseptic or disinfectant For example, whereas 1% ctab took less than 5 minutes to kill about four million naked *Pseudomonas pyocyanea* dispersed in 5 c cm of the watery solution, a similar dose of the microbe enclosed in a thin worm-shaped blood-clot (1 cm × about 1 5 mm) survived the same concentration of ctab for more than 2 hours It may be mentioned in contrast that similar pyocyaneus clots were sterilised in less than 5 minutes by 2% phenol 2% lysol, 1% iodine in 2% potassium iodide, and 10% formalin Again while a 1 in 50,000 dilution of ctab inhibits the growth of *Streptococcus pyogenes* in nutrient broth in 50% horse-blood broth a tenfold higher concentration is needed Ctab is also highly selective, having a more than a hundred times stronger bacteriostatic action on *Staphylococcus aureus* than on *Ps pyocyanea* It seems that the latter microbe, owing to its remarkable resistance to chemicals, deserves a prominent place in disinfection tests

Oxford A D GARDNER.

IS IT A RECORD?

SIR —A patient informs me that in the course of his life he has consumed a third of a ton of Seidlitz powder having swallowed a dose of this explosive every morning for the last sixty-five years To this habit he attributes the fact that he has never had a day's illness, a headache or even the sensation of fatigue He is now just over eighty I cannot calculate how much gas has been, in the aggregate, evolved during this prolonged medication but it speaks well for the resilience of his inner tube that it still responds every morning to the broad hint conveyed by the familiar dose When he tells me that his mother went mountaineering at the age of a hundred and six I wonder of what material this family is composed A colon such as his ought to be in a museum but as it is not likely to be available for another quarter of a century I must ask you to be content with this note

Finchley C WILLETT CUNNINGTON.

BLOOD-GROUP TESTS IN NULLITY ACTION

SIR,—In the case reported where blood-group testing was used to decide a nullity action (*Lancet*, May 9, p 569) you give the husband's blood as OM, the wife's as BM and the child's as ABN The ABO system certainly shows that a husband O cannot be the father of a child AB whose mother belongs to group B because the real father must belong to group A or AB; and moreover, a parent O never can give rise to a child AB But the striking fact here is that the wife's blood contains the factor M, the child's blood the factor N This is not in agreement with the rules of heredity in the MN system Mothers belonging to type M or N transmit the same factor to their children, so that the children must be of the same type M or N; if they belong to type MN, they must have inherited the other factor from the father Three genotypes are to be distinguished within the MN system, namely, MM or NN or MN, corresponding to the three phænotypes M, N and

Letters to the Editor

TOLERATION OF WHOLEMEAL BREAD

SIR,—At the outbreak of war when St Bartholomew's Hospital in London was partly evacuated to the country under the EMS scheme a small medical unit for adult male and female patients was established in Cell Barnes Colony, St Albans. At a later date a part of this unit was set aside for children. The present observations concern 95 beds for adult patients, of which a proportion are kept empty for emergency use.

In the autumn of 1940 at my request the medical superintendent, Dr Noel Burke, kindly arranged for a ration of wholemeal bread to be baked for the patients under my care on two or three days of each week. As this bread proved palatable it was decided to provide only wholemeal bread to all the adult patients. This decision was put into effect on Jan 24, 1941, and since that date no white bread has been issued. At first there was a little complaint about the wholemeal bread being indigestible. Very soon this complaint was made only by new arrivals. Now for some time, as the "atmosphere" has become favourable to wholemeal bread, complaints about it are rarely made, and only once in the past six months have I been asked to explain its advantages—to a patient transferred from another hospital in which white bread only was provided. The number of patients admitted since January, 1941, is 167 male and 163 female, total 330. In my private practice, and among my friends and acquaintances, I not infrequently hear of wholemeal bread and national wheatmeal bread being indigestible. There is an infectious phrase in common use to the effect that "it lies like a ball in my stomach". Time will prove whether or not there are some stomachs that cannot digest this kind of bread, whether the way in which it is sometimes baked affects its digestibility, or whether perhaps some people cannot stomach it because of its novelty, their desire for distinction, their political bias, or for some other reason that is only indirectly concerned with bread.

My object in writing this letter is to place on record my experience over a period of sixteen months in respect of more than 300 inpatients who have eaten wholemeal bread and no white bread, and to express my opinion that it has proved entirely digestible. This opinion is shared by the two highly experienced sisters-in-charge of my wards. It is to be noted that the bread eaten was wholemeal bread. National wheatmeal bread, being only 85% extraction, would supposedly be even more digestible.

Among these 330 patients were 32 male and 14 female patients admitted with peptic ulceration. These patients have been treated with rest in bed, a modified Lenhartz diet, and an alkali mixture. The female patients were given cream crackers after the first week of treatment and wholemeal bread after the first three weeks. The male patients were given wholemeal bread after the first week of treatment—namely, at the stage in the modified Lenhartz diet when they would ordinarily be given rusks. It is my opinion, an opinion shared by the sisters-in-charge of the wards, that the wholemeal bread has proved entirely digestible to patients with peptic ulceration. All patients now take wholemeal bread and none have rusks. A proportion of these patients had already reached the stage of a post-Lenhartz diet on their admission to Cell Barnes Hospital, but against this is set the fact that a number of patients were treated for gastro-enteritis, gastritis, and gastric dyspepsia, without seeming to suffer harm as a result of eating wholemeal bread. In view of the fact that there was considerable prejudice against the provision of wholemeal bread to patients with peptic ulceration, the opinion that it has done them no harm is particularly important.

Detailed observations on the absorption of component parts of wholemeal and national wheatmeal bread are important, especially in respect of iron, calcium, and the vitamin-B complex. The absolute value of wholemeal and national wheatmeal bread will, however, be proved ultimately by mass observation of healthy and sick persons over a number of years. Our experience in Cell Barnes Hospital is a minute contribution to this forthcoming experience. Those of us who prefer white bread will do well to remember that intestinal disorders were far too common before There is a possibility that they were due to the food people ate before the war, and to the way cooked. If this was indeed the case, a gastric dyspepsia and peptic ulceration may be now that our food, both in quantity and kind, is ordered by Lord Woolton and his experienced au

London, W GEOFFREY E

CHALK IN BREAD

SIR,—Surely it will be unfortunate if the medical fession misses the present unique opportunit by the provision of a compulsory war bread to public take medicines assumed to be good fo Hitherto the choice of such additions seems to have b left wholly in the hands of individuals without med training, the addition of chalk, for example, which y leader of May 23 commends, was originally deci upon in July, 1910, on the advice, as a parliament answer shows (Hansard, Feb 12, 1942), of two officers the Ministry of Food, both biochemists without a medical qualification. I have before me a letter fro one of the most eminent of our nutritional scient claiming that the national bread should contain iron deficiency of which, he contends, is much more obvi than the deficiency of calcium. I have again before an extremely well-documented argument demonstrat that the lack of iodine in our food represents a gra menace to our people. Moreover, if chalk and iron a to be consumed in unchecked quantities, such as wou be the case if supplied in bread, constipation, that ba of the British people, would inevitably be increased, an it would obviously be imperative to incorporate laxativ as well. A number of other useful additions will occ to your professional readers, and I submit that this ne venture in mass medication should surely have som measure of guidance from the medical profession, particularly from clinicians, who seem to have been le completely out of the picture by the Ministry of Foo But perhaps the medical profession may ultimately co gratulate itself upon this absence of responsibility for, t paraphrase a famous saying, the time may come whe there will not be enough lampposts in Whitehall fro which to hang the perpetrators of this laboratory inspire experiment.

House of Commons E GRAHAM LITTLE

THE PHYTIC ACID BOGY

SIR,—In your leader of May 23 you define a bogy a something terrifying, mysterious, and unknown. Bu one of its synonyms in the Concise Oxford Dictionary i "bugbear", and it was obviously in that sense tha Sir Frederick Keeble, in the *Countryman* of October, 1941 used the term to describe what had been said abou phytic acid in contributions to the lay press "calculated to dissuade the ignorant from eating wholemeal bread". In Keeble's opinion the suggestion that the alleged rickets-producing effect of phytic acid should act as a deterrent to the consumption of wholemeal bread constituted a bogy or bugbear.

The demonstration of the inhibitory effect of phytic acid on the absorption of calcium appears to rest mainly on the single set of experiments by Harrison and Mellanby on puppies, and on the work of McCance and Widdowson. Even if it be allowed that conclusions drawn from experiments on dogs may be directly applied to human beings, whose digestive processes from the mouth downwards are very different, is it seriously argued that the results now prove that our ancestors who subsisted for generations largely on bread made from stone-ground wholemeal flour were all the time suffering from a calcium deficiency of which they were blissfully unaware? Is it contended that the inhabitants of countries like Russia and Greece, who live largely on black bread, are nothing like so healthy as they appear to be or think they are? Is there any evidence that rickets was prevalent in rural districts in England three or four generations ago, or that the increasing prevalence of rickets in urban areas, as these became more crowded, was not primarily due to lack of sunlight and vitamin D?

In any case, rickets and structural defects of teeth are diseases of childhood. There is no evidence that calcium deficiency can affect the enamel of fully formed teeth, ough it is conceivable it may affect the dentine If efore, it is alleged that the consumption of wholemeal d produces a calcium deficiency in adults it should learly explained in what way this is made manifest expected that there will be, for example widespread rrhagic predisposition ?

ording to the League of Nations technical com- ion each individual on an average needs 1 gramme lcium per day, and the maintenance of the correct um phosphorus ratio which however varies at rent ages It is stated that about a third or so of population of this country has not been getting gh calcium; but Sir John Orr gives this figure as t representing the proportions of the population g below the subsistence level, whose deficiencies are ly of the foods containing minerals and vitamins not therefore reasonable to select lack of calcium as solated or exceptional phenomenon and definitely e it to phytic acid Moreover, it should be remem- d that the recommendation by the Medical Research ncil in 1940 was in tentative terms and the proviso made that bread treated with calcium should be so gnated in order that persons who did not wish to e it could avoid it The action of the ministry is based on the advice of medical men but on that of chemists attached to the ministry, although most ists are against the method

t, indeed there is no justification for tacitly assum- that any shortage of absorbable calcium in wholemeal d is not easily remediable Milk and cheese are the sources of calcium but, as Keeble points out, cab- s carrots onions and leeks contain adequate ies and it should be remembered that shortage of k in which there is little calcium automatically ces people to eat more of other foods containing e calcium Presumably in the belief that people not consume enough of these it is proposed to add lk to bread Is there any evidence to show just how h of this inorganic salt is likely to be absorbed ? An erienced clinical investigator believes that only an nic salt like the lactophosphate is at all readily rbed. Moreover the researches of C J. McDougall e Counteraction by fat of the anticalcifying action of als *Biochem J.* 1938 32, 194) should surely not be red. She found by experiments on rats that, with a t containing a high proportion of cereals and relatively e calcium and vitamin D, the so-called anticalcifying ency of the cereals due to phytic acid is counteracted the presence of 10% of lard or olive oil She offers explanation that the absorption of calcium is pro- ted by the formation of calcium soaps with the fatty s which thereby inhibit the formation of an insoluble pound of calcium and phytin.

r William Bragg has stressed the value of accumu- ed experience in assessing the value of scientific truth ed, it is clear that sweeping generalisations based ly on laboratory experience which are not in accord h knowledge gained by the human race over many ries cannot be regarded as tenable and that matic assertions which discourage the consumption a food which is in many respects beneficial may fairly scribed as the setting up of a bogy.

ey Street, W 1 NORMAN BENNETT.

HEREDITY IN PSYCHONEUROSIS

SIR —I do not wish to appear ungrateful for your ice (*Lancet*, May 30, p 660) of my paper to the Royal of Medicine, but I am quoted as saying " there is no significant difference between the incidence of ical abnormalities in parents of patients with an ety state and those of the control group ' Actually e of the main points was that there was a significant erence in incidence of psychiatric abnormalities ween the parents of all three psychoneuroses, and the trol group The figures were. 21% of parents of ents with anxiety state suffered from anxiety state of parents of hysterics suffered from hysteria, 7 5% the parents of obsessionals were obsessionals There s evidence of similar incidence among all the first ree relatives There was also evidence of relation- ip between depressive psychosis and the psycho- roses, 2 7% of the second degree relatives of anxiety es suffered from depressions, 4 4% of the second relatives of obsessionals suffered from depressions. 7 5% of parents of obsessionals (not 70% as quoted in the review) suffered from depressive psychosis Finally I do not suggest that psychoneuroses occur by a shuffling of the factors responsible for normal personality, but rather that these play a part with the environment perhaps together with a specific psychopathic factor common to all the psychoneuroses The work has been done for the Medical Research Council and you will appreciate that I am anxious that the wrong figures should not be accepted

Guy's Hospital FELIX W BROWN

CTAB

SIR,—In his letter of May 23 Mr Berry writes that since 'Zephiran,' a comparable cationic detergent is affected by protein it is reasonable to assume that 'Ctab (cetyl-trimethyl-ammonium bromide) will be similarly affected Dr Barnes, in the *Lancet* of May 2 (p 531) observes that it is not clear why rubbing a granulating surface for a minute with a 1% solution of ctab completely fails to sterilise it In the course of some experiments on methods of testing disinfectants I have had occasion to verify Mr Berry's surmise and solve Dr Barnes's problem Like zephiran ctab is heavily inactivated by blood serum and other protein-matter, and in this respect is far from being an ideal antiseptic or disinfectant For example whereas 1% ctab took less than 5 minutes to kill about four million naked *Pseudomonas pyocyanea* dispersed in 5 c cm of the watery solution, a similar dose of the microbe enclosed in a thin worm-shaped blood-clot (1 cm × about 1 5 mm) survived the same concentration of ctab for more than 2 hours. It may be mentioned in contrast that similar pyocyaneus clots were sterilised in less than 5 minutes by 2% phenol 2% lysol, 1% iodine in 2% potassium iodide, and 10% formalin Again while a 1 in 50 000 dilution of ctab inhibits the growth of *Streptococcus pyogenes* in nutrient broth in 50% horse-blood broth a tenfold higher concentration is needed Ctab is also highly selective, having a more than a hundred times stronger bacteriostatic action on *Staphylococcus aureus* than on *Ps pyocyanea* It seems that the latter microbe, owing to its remarkable resistance to chemicals deserves a prominent place in disinfection tests

Oxford A D GARDNER

IS IT A RECORD ?

SIR,—A patient informs me that in the course of his life he has consumed a third of a ton of Seidlitz powder, having swallowed a dose of this explosive every morning for the last sixty-five years To this habit he attributes the fact that he has never had a day's illness, a headache or even the sensation of fatigue He is now just over eighty I cannot calculate how much gas has been, in the aggregate evolved during this prolonged medication but it speaks well for the resilience of his inner tube that it still responds every morning to the broad hint conveyed by the familiar dose When he tells me that his mother went mountaineering at the age of a hundred and six I wonder of what material this family is composed A colon such as his ought to be in a museum but as it is not likely to be available for another quarter of a century I must ask you to be content with this note

Finchley C WILLETT CUNNINGTON.

BLOOD-GROUP TESTS IN NULLITY ACTION

SIR —In the case reported where blood-group testing was used to decide a nullity action (*Lancet*, May 9, p 569) you give the husband's blood as OM, the wife's as BM and the child's as ABN The ABO system certainly shows that a husband O cannot be the father of a child AB whose mother belongs to group B because the real father must belong to group A or AB; and moreover, a parent O never can give rise to a child AB But the striking fact, here is that the wife's blood contains the factor M, the child's blood the factor N This is not in agreement with the rules of heredity in the MN system Mothers belonging to type M or N transmit the same factor to their children, so that the children must be of the same type M or N, if they belong to type MN, they must have inherited the other factor from the father Three genotypes are to be distinguished within the MN system, namely, MM or NN or MN, corresponding to the three phænotypes M, N and

Letters to the Editor

TOLERATION OF WHOLEMEAL BREAD

SIR,—At the outbreak of war when St Bartholomew's Hospital in London was partly evacuated to the country under the EMS scheme a small medical unit for adult male and female patients was established in Cell Barnes Colony, St Albans At a later date a part of this unit was set aside for children The present observations concern 95 beds for adult patients, of which a proportion are kept empty for emergency use

In the autumn of 1940 at my request the medical superintendent, Dr Noel Burke, kindly arranged for a ration of wholemeal bread to be baked for the patients under my care on two or three days of each week. As this bread proved palatable it was decided to provide only wholemeal bread to all the adult patients This decision was put into effect on Jan 24, 1941, and since that date no white bread has been issued At first there was a little complaint about the wholemeal bread being indigestible Very soon this complaint was made only by new arrivals. Now for some time, as the "atmosphere" has become favourable to wholemeal bread, complaints about it are rarely made, and only once in the past six months have I been asked to explain its advantages—to a patient transferred from another hospital in which white bread only was provided The number of patients admitted since January, 1941, is 167 male and 163 female, total 330 In my private practice, and among my friends and acquaintances, I not infrequently hear of wholemeal bread and national wheatmeal bread being indigestible There is an infectious phrase in common use to the effect that "it lies like a ball in my stomach" Time will prove whether or not there are some stomachs that cannot digest this kind of bread, whether the way in which it is sometimes baked affects its digestibility, or whether perhaps some people cannot stomach it because of its novelty, their desire for distinction, their political bias, or for some other reason that is only indirectly concerned with bread

My object in writing this letter is to place on record my experience over a period of sixteen months in respect of more than 300 inpatients who have eaten wholemeal bread and no white bread, and to express my opinion that it has proved entirely digestible This opinion is shared by the two highly experienced sisters-in-charge of my wards It is to be noted that the bread eaten was wholemeal bread National wheatmeal bread, being only 85% extraction, would supposedly be even more digestible

Among these 330 patients were 32 male and 14 female patients admitted with peptic ulceration These patients have been treated with rest in bed, a modified Lenhartz diet, and an alkali mixture The female patients were given cream crackers after the first week of treatment and wholemeal bread after the first three weeks The male patients were given wholemeal bread after the first week of treatment—namely, at the stage in the modified Lenhartz diet when they would ordinarily be given rusks It is my opinion, an opinion shared by the sisters-in-charge of the wards, that the wholemeal bread has proved entirely digestible to patients with peptic ulceration All patients now take wholemeal bread and none have rusks A proportion of these patients had already reached the stage of a post-Lenhartz diet on their admission to Cell Barnes Hospital, but against this is set the fact that a number of patients were treated for gastro-enteritis, gastritis, and gastric dyspepsia, without seeming to suffer harm as a result of eating wholemeal bread In view of the fact that there was considerable prejudice against the provision of wholemeal bread to patients with peptic ulceration, the opinion that it has done them no harm is particularly important

Detailed observations on the absorption of component parts of wholemeal and national wheatmeal bread are important, especially in respect of iron, calcium, and the vitamin-B complex The absolute value of wholemeal and national wheatmeal bread will, however, be proved ultimately by mass observation of healthy and sick persons over a number of years Our experience in Cell Barnes Hospital is a minute contribution to this forthcoming experience Those of us who prefer white bread will do well to remember that intestinal disorders were far too common before There is a possibility that they were due to the food people ate before the war, and to the way cooked If this was indeed the case, a le gastric dyspepsia and peptic ulceration may be now that our food, both in quantity and kind, is ordered by Lord Woolton and his experienced ad

London, W GEOFFREY Ev

CHALK IN BREAD

SIR,—Surely it will be unfortunate if the medical p fession misses the present unique opportunity affor by the provision of a compulsory war bread to make public take *medicines assumed to be good for* the Hitherto the choice of such additions seems to have be left wholly in the hands of individuals without medi training, the addition of chalk, for example, which yo leader of May 23 commends, was originally deci upon in July, 1910, on the advice, as a parliamenta answer shows (Hansard, Feb 12, 1942), of two officers the Ministry of Food, both biochemists without a medical qualification I have before me a letter fro one of the most eminent of our nutritional scienti claiming that the national bread should contain iron deficiency of which, he contends, is much more obvio than the deficiency of calcium I have again before m an *extremely well-documented argument demonstrat* that the lack of iodine in our food represents a gra menace to our people Moreover, if chalk and iron a to be consumed in unchecked quantities, such as wou be the case if supplied in bread, constipation, that ba of the British people, would inevitably be increased, a it would obviously be imperative to incorporate laxativ as well A number of other useful additions will occ to your professional readers, and I submit that this ne venture in mass medication should surely have som measure of guidance from the medical profession, particularly from clinicians, who seem to have been le completely out of the picture by the Ministry of Foo *But perhaps the medical profession may* ultimately co gratulate itself upon this absence of responsibility for, t paraphrase a famous saying, the time may come whe there will not be enough lampposts in Whitehall fro which to hang the perpetrators of this laboratory inspire experiment

House of Commons E GRAHAM LITTLE

THE PHYTIC ACID BOGY

SIR,—In your leader of May 23 you define a bogy a something terrifying, mysterious, and unknown Bu one of its synonyms in the Concise Oxford Dictionary "bugbear", and it was obviously in that sense tha Sir Frederick Keeble, in the *Countryman* of October, 1941 used the term to describe what had been said abou phytic acid in contributions to the lay press "calculate to dissuade the ignorant from eating wholemeal bread In Keeble's opinion the suggestion that the allege rickets-producing effect of phytic acid should act as deterrent to the consumption of wholemeal bread con stituted a bogy or bugbear

The demonstration of the inhibitory effect of phyti acid on the absorption of calcium appears to rest mainl on the single set of experiments by Harrison and Mellanb on puppies, and on the work of McCance and Widdowson Even if it be allowed that conclusions drawn from exper ments on dogs may be directly applied to human being whose digestive processes from the mouth downward are very different, is it seriously argued that the result now prove that our ancestors who subsisted for genera tions largely on bread made from stone-ground whole meal flour were all the time suffering from a calcium deficiency of which they were blissfully unaware? I it contended that the inhabitants of countries like Russia and Greece, who live largely on *black bread*, are nothing like so healthy as they appear to be or think they are Is there any evidence that rickets was prevalent in rur districts in England three or four generations ago, o that the increasing prevalence of rickets in urban area as these became more crowded, was not primarily due to lack of sunlight and vitamin D?

In any case, rickets and structural *defects of teeth* ar diseases of childhood There is no evidence that calcium deficiency can affect the enamel of *fully formed* teeth

REATMENT OF RECENT WAR WOUNDS

FRENCH AND SPANISH METHODS

H FRUCHAUD, M D

MMANDANT, FREE FRENCH FORCES, PROFESSOR OF SURGERY, CHIEF SURGEON TO THE HADFIELD SPEARS HOSPITAL UNIT

THE object of these remarks is to show that in treating cent war wounds the French method of epluchage—cision of a wound in its entire extent—is the most imortant curative factor, that all other therapeutic proedures are secondary, and that even after an initial delay us treatment can be carried out with success There ay be as much as two days' delay, perhaps even more amilton Bailey[1] says "Certainly after twenty-four ours the period of safety has passed Surgical terference *now becomes dangerous* Extensive rocedures such as wound excision will certainly produce severe general reaction, while locally they are futile fter a lapse of twenty-four hours, the time for primary xcision of the wound has passed, and the utmost aution must be exercised in undertaking any active ntervention" This view I regard as wrong and dangerus Apart from very small wounds, such as may be aused by tiny splinters, surgical intervention is called or in all these wounds, at whatever stage they are first een The greater the lapse of time between the infliction f the wound and its first receiving surgical treatment, the reater become the risks of non-intervention The ature of the treatment will vary with the time at which he case is first seen, but nine-tenths of the accidents ecorded as resulting from late surgical intervention are ue to the fact that the surgeon has not been bold enough, has not sufficiently opened up the wound, has left an nexplored cavity or a closed cavity without drainage

We understand by "recent" war wounds those wounds which come to the surgeon within forty-eight hours of their infliction Admittedly sepsis can develop six to eight hours after injury We have twice seen gas gangrene which appeared two days after the injury, both cases being soldiers picked up after delay on the battlefield Such cases of early septic infection are exceptional, and in general one does not regard a wound as septic during the first twenty-four, or even the first forty-eight hours In these fresh wounds the tissues which have not been crushed by the missile retain their normal form and colour and there is only slight œdema The greater the delay before surgical treatment is instituted, the more pronounced will the œdema be The muscles gradually alter in appearance and colour and the evidence of early septic changes is apparent to the experienced surgeon

We are not dealing here with wounds involving viscera (chest and abdominal wounds) but with recent wounds of the muscles and bones, and more particularly with those of the limbs, buttocks and shoulder These wounds constitute 80–90% of those brought to the surgeon behind the lines, and are what French authors understand by "war wounds"

Débridement and Épluchage

The French method of dealing with recent war wounds is that of "epluchage," or *excision* of wounds, and is a much more extensive operation than "debridement," or *enlargement*, of wounds Débridement was practised as far back as the wars of the 16th century, and Larrey used it in the Napoleonic wars Epluchage was perfected as a method by the French surgeons Gaudier and Lemaitre in 1915–16 As early as 1897 a German writer, Friedrich, had realised that in every wound two elements required attention—the micro-organisms and the injured tissues—and that excision of all dead tissue was an essential element in combating suppuration But the teachings of Friedrich were not accepted by the surgical world till French surgeons in the 1914–18 war established the technique of epluchage

The first stage of the operation is certainly debridement, but this must be a complete opening up of the seat of trauma, and there must be no mistake about the thoroughness My experience has taught me that in every country there are surgeons who fail not only in their excision of wounds but in the initial exposure I grant that where the wound is very deep—as it may be, for instance, in the thigh—this exposure is hindered Anatomical considerations, and the attempt to preserve neurovascular bundles, important muscles and tendons which have so far escaped injury may cause the surgeon to hesitate He can overcome the difficulty by counterincision and further debridement, as extensive as may be necessary, on the opposite side of the limb Knowledge of anatomy should ensure against mutilation in this fresh incision, but neglect to carry it out leads only to catastrophe

Total debridement is a vital factor in war surgery of the limbs, and it is particularly important to incise the aponeurosis, which confines the muscles and blood-clot in an inextensible sheath The inexperienced surgeon is frightened by the extent of the skin incision required for full exposure of the depth of the wound A splinter 2 cm by 8 cm produces a skin wound little larger than itself but it shatters bone and tears muscle over an area of 7–8 cm square, and the incision or incisions will have to be 10–12 cm long No hidden corner must be left, all injured bone and muscle must be brought to light Only thus can the limb be protected from gas gangrene, diffuse cellulitis, and streptococcal infection, and the patient saved from the dangers of septicæmia It is true that suppuration in the wound is not prevented by this limited operation, because dead tissues and organisms are left in situ But in difficult circumstances this may be the best that we can do A few months ago, in a steep and rugged mountainous district where evacuation of the wounded was very slow, we went out to the front lines with the Foreign Legion of the Free French Forces, and, working in the open air, practised debridement on all the wounds In no case was there any serious sequela, though the subsequent progress of the cases was necessarily slow

Debridement alone, however, is not ideal; nor is it worthy of modern surgery Where sufficient surgical equipment is available the operation should be carried to completion by epluchage Using retractors, the surgeon explores the depths of the wound Missiles, bits of clothing and other foreign bodies, crushed and devitalised tissues are all removed, every hidden corner is examined and every recess opened up, so that there is no possibility of any dead material which favours bacterial growth being allowed to remain It is often a difficult operation and one calling for thorough knowledge of anatomy, great gentleness in handling, perfect hæmostasis rigid asepsis and a knowledge of the biological structure of muscles and bones It is not an operation for the inexperienced surgeon But, when properly performed, it can transform the wound into a biologically aseptic one Any organisms left are simply starved out

Credit is due to the French surgeons for evolving the method of epluchage, but their great mistake was that they wished to follow it by a third stage of suture The whole idea of primary suture was a pernicious one, abandoned by all reasonable people long before the present war—long before the Spanish war We ourselves gave it up fifteen years ago Unfortunately, however, the teaching of Pierre-Duval continues to bear fruit, and the many bad results of primary suture have discredited the method of epluchage in the eyes of young surgeons This is nothing short of a catastrophe, it was already evident in French surgery as far back as 1926, and accounts for an exaggerated reaction against epluchage in the Spanish war and again in this war The numerous successes obtained by excision followed by primary suture are more than offset by the failures *Reports of 90% successes do not tell* us the fate of the 10% failures How many of these wounds were badly infected? How many have proved fatal when if left open they would have healed? Excision can never be complete enough for us to be certain that all bacteria are excluded, and the suture of œdematous tissues under tension endangers their viability Healthy muscle may be sacrificed in the effort to draw the wound edges together I never suture a traumatic wound, most certainly never a war wound It is not worth the risk, if the result is to effect a cure of 90% of the cases in fifteen days, instead of 100% in two months

The surgeon must change his tactics according to the time that has elapsed between infliction of the wound and treatment In recent wounds—6–8 hours old—complete excision is correct As delay increases the appearance of the wound changes The muscles lose their

---

[1] Surgery of Modern Warfare London, 1942, p 10

Tuberculosis Association

It is hoped to hold the provincial meeting in Oxford from midday Thursday, July 2 to midday Saturday, July 4 Accommodation for men has been arranged in New College (max number 90) and for ladies in Somerville (max number 15) There is no restriction on the number who may attend if they can find their own accommodation Applications to the hon secretary, 135, Harley Street, W 1, not later than June 13 In the course of the conference, the annual general meeting will be held at which some council members will be elected for the ensuing year The complete agenda will be circulated later The subjects will probably include the closed suction drainage of tuberculous cavities and a radiological and pathological demonstration

Children's Nutrition Council

At a conference of the Edinburgh branch of the council held on May 30, Sir Robert Greig, the president, said that after the war Europe would be starving and international action would be necessary to bring it back to an ordinary state of nutrition It was therefore important to impress upon townspeople an interest in agriculture and not to let them imagine that milk descended from the skies or came out of tins Dr G J I Linklater, school medical officer, said that over six years ago the education committee had been concerned about the feeding of children and had made plans which were stopped by the onset of the war and the temporary closing of the schools The re establishment of school feeding has been subject to many complications chiefly lack of adequate premises and difficulty in obtaining equipment of a labour saving type Transport too has been difficult They had experimented with a weekly menu planned by a dietitian in accordance with the dietary suggested by the Scottish Education Department, and after modifying it at the cooking centre they found they could not get the rations, since these were not to be had in the market for that week Accordingly day to day improvisations were made It was disappointing that, whereas 35,000 Edinburgh children had the extra milk during the last school session, only 9000 came for it during the holidays

Appointments

BIRD J G M D DUBL asst physician to the Royal Berkshire Hospital Reading

DAVIES, J V, M B LOND, M R C P resident asst physician at the British Postgraduate Medical School

HARBISON, B L, M B SYDNEY, F R C S E RSO at Hexham Hospital Northumberland

JAMISON C E M B BELF temp first asst MO at Forest Gate Hospital, E 7

MILNER K O M D LEEDS, D P M deputy medical superintendent of Rampton State Institution for mental defectives, Retford

O'DONNELL MARY J, M B N U I asst MO (maternity and child welfare) for Berkshire

Births, Marriages and Deaths

BIRTHS

HORGAN —On May 25, at Tralee, co Kerry, the wife of Mr M J Horgan, F R C S —a daughter

MILLIN —On June 6, at Chelsea Hospital for Women the wife of Mr T J Millin F R C S —a daughter

MOLE —On May 31, at Oxford, the wife of Dr R H Mole—a daughter

MOLESWORTH —On June 5, at Blackpool, the wife of Dr B D Molesworth—a daughter

SCOTT —On May 30, at Midhurst, the wife of Dr J A L Scott—a daughter

WRIGLEY —On June 3, the wife of Dr C H Wrigley of Winchester —a son

MARRIAGES

BRICE—PRYKE —On May 26, at Belfast Surgeon Lieutenant F J BRICE, R N V R, to Doreen Nyren Pryke

CAMPBELL—GRAY —On June 6, at Ingatestone Captain J W Campbell, M B R A M C to Mary Elizabeth Gray

GRAY—WALKER —In Szechwan China, Max Western Gray, M R C S, to Irene E Walker

DEATHS

BROOK —On May 27, at Accrington, Sydney Wilkinson Brook M B MANC AND LOND, aged 71

BUSH —On May 6, at Hove, Frank Parkinson Bush, L S A, late of Norwich

KERR LOVE —On May 31, at West Kilbride, James Kerr Love, M D, LL D GLASG, F R F P S, aged 84

PAGE —On June 2, at Hurlingham Court, Fulham, Harry Marmaduke Page, F R C S, D I H aged 81

WARNOCK —On June 1, at Richmond, Surrey John Warnock, C M G, M D, B SC EDIN, director lunacy division, Ministry of Interior, Egypt, 1914–23

WOLFE —On May 31, at Sidmouth, John Henry Wolfe, M R C S, L S A, late of Hanwell

RESEARCH IN PHARMACEUTICS

THE College of the Pharmaceutical Society pursued many of the lines of research which were progress last year A convenient biological of assessing vitamin B_1 has been sought, and A, B_2, D and E have also been studied, the b static action of acridine derivatives is still being gated and studies are being made of synthetic pounds with corticosterone-like activity, and synthetic œstrogens and methods of preparing derivatives The department of pharmacology has studied adrenergic transmission, the cortical hormo biological assay of digitalis, delay of blood coagulation by 'Perspex,' the standardisation of heparin, blood histamine levels after adrenalectomy, and the effect of subcutaneous implantation and thyroxine tablets Routine tests have been made on samples of drugs and pituitary extract It is noteworthy that determinations of the vitamin-D content of samples of margarine, made on behalf of the Ministry of Food, have consistently given values which came up to expectation Results of research in the department of pharmacognosy have been contributed to the British Pharmacopœia and Pharmaceutical Codex

LIVING IN CITIES

HOW many citizens know what their city really looks like? A cathedral, a castle and a few streets of well designed buildings linger pleasantly in the mind's eye, but the rest is formless chaos consider all that has been perpetrated in bricks, mortar and concrete in the twenty years between two wars The population shifts caused by evacuation have produced serious overcrowding in country houses Meanwhile the gratuitous demolitions and excavations by Blitz & Co have ensured that postwar development will present us not only with tasks but also with opportunities What are we going to do about them? The problem is discussed in nice perspective by Ralph Tubbs ("Living in Cities" Penguin Books 1*s*) Here with little text, and with telling photographs the story of the growth of cities is described, and the future considered Architects and planners have shown that they have the technical knowledge, ability and vision to build a new world If they are not given full scope it will be because profits in land and buildings are put before public needs The story has been told in a rather different way in "Your Inheritance" (Architectural Press 1*s*), another pictorial essay Here the development of one plot of land is traced down the centuries The successive changes, for good or evil, of open field, enclosure, planting, landscaping, factory culture, and suburbanisation are shown, leading up to the present destruction What can be done in a few years by planned development in a country where the land belongs to the community and no questions of rent, profit or compensation interfere is described and illustrated in an article on the reconstruction of Moscow by Arthur Ling (*Anglo-Soviet Journal*, 1942, 3, 91)

At 2 p m on June 17 Mr E J King, Ph D, will lecture at the British Postgraduate Medical School on acidosis and alkalosis

FACULTY OF SCIENCE —At 7 p m on June 18, at the London School of Hygiene, Keppel Street, W C 1, a discussion will be held on a paper on the meaning of race read by Mr G M Morant, D Sc, at the symposium of the faculty at Easter Copies of Dr Morant's paper will be sent to all applicants for tickets, price 2*s*, from the secretary of the faculty, Mary House, Clerkenwell Green, E C 1

Solution of last week's Crossword

At Surgical Consultations

S	T	U	D	E	N	T	Y	E	A	R
I	N	N	O	C	E	N	T	L	N	U
R	E	U	P	I	E	E	N	K	R	B
I	S	S	E	N	D	B	E	N	I	H
U	N	U	M	R	S	O	G	A	H	A
Q	U	A	E	S	S	P	I	H	C	C
A	B	L	E	T	I	O	N	A	R	K
M	A	N	T	A	T	F	E	D	O	S
S	T	E	A	M	E	T	F	I	N	D

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export

large muscular lesions, especially when the patients have to be evacuated long distances under difficult circumstances, and where wounds of nerves or muscles are likely to lead to malposition of the limb for example, an extensive laceration of the calf with drop-foot Immediate postoperative immobilisation is best for these cases

In the treatment of open fractures of warfare, and of articular or osteoarticular wounds, there is no question that immobilisation in plaster is indispensable Here we are in complete agreement with the Spanish school We know from experience that badly immobilised fractures, even after operation, can lead to disaster. For war fractures plaster is the only method of immobilisation that has proved completely effective The Thomas or Rouvillois splints are excellent improvisations for immobilising the patient between the firing-line and the operating-theatre but after the operation they are inferior devices In war surgery the destruction of muscle and other tissue is such that there is practically no overlapping of bone-ends An improvised orthopædic table is enough to allow the bone to be set in good position Traction is as a rule unnecessary, an orderly can support the limb The plaster must be complete—every fracture of the thigh demands a plaster which includes the hip, every fracture of the arm a plaster enclosing the thorax The plaster must be applied immediately after the operation with the patient still under the anæsthetic There must be no intermediate, inefficient splinting

* * *

The merit of the Spanish school has been that it has reminded us of these principles of enclosure and immobilisation of wounds The methods have, as we have shown, led at times to neglect of the fundamental principles of war surgery, and in this there is serious danger. Nothing can replace the early and extensive operation which will always remain of primary importance This treatment of war wounds, essentially French in origin, gives magnificent results The results are better the earlier one can operate It is none the less consoling to find that many wounded will recover after much later operation, provided that the wound is thoroughly opened up and any neighbouring fracture completely immobilised

In the use of sulphonamides either by direct application to the wound or by mouth we must beware of the exaggerated enthusiasm of certain American writers In May, 1940, we received some wounded from the front whose wounds had been sprinkled with sulphanilamide powder, and the results were very bad We give sulphapyridine in large doses by mouth to patients with very extensive injuries to muscles or bones, especially when operation has been delayed beyond the eight-hour limit This is undoubtedly an excellent auxiliary treatment, but it will never prevent complications without surgical intervention

Mrs Spears has created for the Free French Forces a surgical ambulance unit which is both complete—with full operating equipment, including autoclave, sterilising and X ray apparatus—and mobile This ambulance unit can be established within a few hours under canvas and function at a short distance from the firing-line. It has allowed us to operate on wounded without delay and before infection has set in, and in this way to attain consistent results Early operation, which we consider vital, cannot be assured unless the surgeon and his apparatus can follow the battle This we have been able to do

I am grateful to my colleagues, Dr Queneudec, Dr Jilberry and Dr and Madame Asquins for their help and to the Rev Father P. Kelly, chaplain to the unit, and Mr I Scott-Kilvert who translated this article

---

ROYAL SOCIETY OF MEDICINE —Short papers will be read at the meeting of the section of medicine at 4 30 P M., on Tuesday, June 23 Dr Albert Eidinow will speak on the action of light on the blood, Dr R G Macfarlane on the clinical applications of sternal puncture, and Dr P L Mollison on the survival of transfused blood in hæmolytic anæmias On June 27 the section of odontology will meet at noon at the Queen Victoria Hospital, East Grinstead, when Mr A H McIndoe will discuss fractures of the middle third of the face In the afternoon there will be demonstrations and a ward round.

DIFFERENTIAL DIAGNOSIS OF DYSPEPSIA

ANALYSIS OF 217 SERVICE CASES

A. MORTON GILL
M D. LOND, M R C P.

F R BERRIDGE
M.B CAMB, D M R

R ARDEN JONES, M B LOND

(From an EMS Hospital)

AT the outset of hostilities many reservists, recalled to the colours, broke down early because of gastroduodenal lesions, chiefly organic, in the form of ulceration, which had developed since their term of regular service (Payne and Newman 1940). Once these had been weeded out, a steadily increasing flow of conscripts yielded large numbers of men with dyspepsia in most cases dating from civilian life, and those with gastroduodenal ulceration were outnumbered, or at least equalled, by those in whom little or no organic disease was found The third phase, now beginning, may well be marked, as the average age rises by an increasing number of cases showing a predominance of organic gastric lesions, including carcinoma This paper is concerned with cases of dyspepsia belonging to the second phase

A high incidence of peptic ulceration is reported in Service dyspeptics, approximately half the cases of dyspepsia reaching hospital are diagnosed as cases of ulceration, although the proportion in the different series varies considerably.

	Ulcers (%)
Graham and Kerr (1941)	64 2
Hutchison (1941)	45 5 35 5
Hinds Howell (1941)	55 3
Saffley (1941)	38 7
Allison and Thomas (1941)	53

Essentially the diagnosis was made by radiology, but in many of the papers the precise criteria for the diagnosis of ulceration were not stated However, Allison and Thomas (1941), in an analysis of 89 cases, clearly state the criteria which they adopted, and reveal that the diagnosis of duodenal ulceration was often presumptive. They attempted to maintain a more rigid radiological standard, but were unable to do so because they were handicapped by inferior apparatus Scadding (1941) has classified his cases on the basis of tonus Greater uniformity in radiological standards is evidently required

No satisfactory classification of the non-ulcer dyspepsias, appears to exist Graham and Kerr consider 24 39% of all their cases of dyspepsia to have gastritis, the remaining 11 38% in the non-ulcer group being classed as miscellaneous, but the basis of the diagnosis of gastritis seems rather obscure. In contrast, Hutchison classes 28 4% of dyspepsias as functional and 6% as gastritis, while in 19% he finds conditions varying from hyperchlorhydria to dyspepsia of obscure ætiology In other papers such diagnoses as pylorospasm, and even irritable stomach, may be found One of our own cases arrived with the diagnosis of wizened duodenal cap The lack of agreement about the diagnoses in this large group thus seems to be even more profound than in the ulcer group Gastritis and duodenitis are mentioned in some papers, but the clinical and pathological pictures tend to be left to the imagination Radiological criteria are often omitted or are indefinite and other investigations have been incomplete Cordiner and Calthrop (1936), Cordiner (1942) and Berridge (1942) have shown that the mucosal pattern technique can demonstrate abnormal inflammatory states of both gastric and duodenal mucosæ Bulmer (1939), using the Wolf Schindler flexible gastroscope, found that 40% of patients with negative radiological findings had chronic gastritis and 6% an ulcer of the stomach, and more recently Schindler (1940) emphasised the importance of the gastroscope in evaluating dyspepsia in soldiers, and the injustice of labelling a man's symptoms non-organic on the strength of clinical impression and radiological findings alone

In the series of cases reported here investigation was more complete, our object has been to show the classification in use at this hospital and to analyse the criteria fibrous structure, become dark red and are covered by a layer of coagulated fibrin. Excision at this stage should be less complete. If the wound is first seen at a very late stage infection is imminent, and excision may be confined to a simple débridement. It is always essential to extract foreign bodies, blood-clot, completely crushed muscle and shreds of torn fascia. In every war wound left to its own devices we risk catastrophe, while experience has shown that a correct type of excision, with complete exposure and the wound left open, is never followed by untoward incident.

We never insert gauze packs, drainage-tubes or strips of rubber. We consider that all artificial drainage is useless, and prefer to cover our wounds with a thick aseptic dressing. We do not practise irrigation. After fifteen days, removal of the dressing reveals healthy pink granulations in the depth of the wound. The skin alone is gaping. But to assure that success which my experience has led me confidently to expect, it is essential to insist on infrequent dressings. This brings me to a discussion of the closed plaster method of treating wounds.

Closed Plaster

The treatment of wounds by the closed method is an old-established procedure which has emerged from the Spanish war with an entirely new reputation. This is but one more example of the swing of the pendulum in the evolution of science: a new discovery follows on the heels of the old, and throws into the shade all interest in the former achievement. We have to rediscover what our fathers practised before us. In the records of the Royal Academy of Surgery, published in Paris in the eighteenth century, we can read how the surgeons of that day embalmed their wounds in aromatically impregnated dressings and obtained most excellent results. In 1870, the great Lyons surgeon, Ollier, whose work constitutes the basis of all modern bone surgery, recommended the treatment of wounds by closed dressings, left in place for weeks or months, and by strict immobilisation. The appearance of aseptic surgery was followed by a certain loss of interest in the healing of wounds, and the practice was to cover them with small, light, easily changed dressings. The antiseptic methods of treatment by various forms of irrigation led to the adoption of frequent dressings, and thus the ideal method of closed dressing was forgotten. The Lyons school of surgery had never abandoned the principles of Ollier, and strongly advocated "permanent" dressings. During the war of 1914–18, Professor Tixier of Lyons immobilised open fractures in plaster, leaving them untouched for one or two months. During the Serbian retreat Professor Leveuf of Paris immobilised the limbs of his wounded in large plasters which facilitated their evacuation, and I have personally practised this method, which is a product of the Lyons school, for over twenty years with consistently good results. This is the same treatment which has been re-established in America for the treatment of osteomyelitis, and the one which is highly praised in Trueta's book on war injury. But here the method of enclosure in plaster has led to disregard for the fundamental principles of surgery. There are two elements in the closed plaster method—enclosure of the wound and immobilisation. Let us discuss these separately.

ENCLOSURE OF THE WOUND

When a war wound of the soft parts has been operated on as described and has been covered with a very large aseptic dressing, fairly thickly padded and fixed so that it neither slips nor turns, it is protected from external infection and heals under perfect conditions. The secretions cover the wound and soak into the dressings, but the depths of the wound are free from trauma and complication, and at the end of fifteen days the wound is well enough healed to allow of its edges being undercut and sutured, or of its surface being grafted. Under these circumstances frequent dressings, even when well carried out (and how often are they?) involve the danger of inoculating the wound from outside. The trauma involved in tearing off the dressing exposes a fresh bleeding surface for the absorption of organisms and hinders the cicatrisation of the wound. On the other hand, I see no purpose or necessity, in the vast majority of wounds of the soft parts, for the application of plaster. The exception will be dealt with later on.

IMMOBILISATION OF WOUNDS

Immobilisation of tissues is admittedly an ex method of promoting resistance to infection, but, best it is no more than a palliative. At the end of Spanish war we received in France a conside number of wounded from the Barcelona sector general condition of the patients was, in the majority of cases, satisfactory. On removal of the plasters, however, we received many unpleasant surprises. The operative procedures had been inadequate. The wounds h merely been widened, and the débridement had in cases been insufficient. The limbs had then been encased in large plasters, admirably applied. The incomplete operation had not prevented the development of suppurative complications, but the immobilisation had modified their course. Instead of gas-gangrene, streptococcal septicæmia and diffuse cellulitis, extensive localised suppuration had occurred. These infective conditions, developing under the plaster, had produced neither pain nor fever. Nevertheless, when the plaster was removed one to two months after infliction of the wound, it was necessary to drain large abscesses and to amputate limbs suffering from osteomyelitis and severe arthritis. It is clear that strict immobilisation is an admirable method complementary to the operation of épluchage, but that it can never compensate for inadequate épluchage.

The chief danger of immobilisation in plaster, as practised by the Spaniards in the treatment of war wounds, is that this complementary treatment may be substituted for the essential operation. In Hamilton Bailey's "Surgery of Modern Warfare"[2] we read an astonishing statement: "… after twenty-four hours anything in the *nature of stereotyped treatment*, viz., routine excision of the wound, is out of place. … Nevertheless, it is clear that the present tendency is to leave a larger proportion of such cases for treatment by dressings (including plaster) and splints than formerly. It should be noted particularly that since the introduction of the closed plaster technique this conservative tendency has been strengthened." To carry this policy into effect will cost many lives.

The second charge we bring against the Spanish method is that the technical details of moulding the plaster have taken on the ceremony of a semi-religious rite. Immobilisation of a limb by encasing the joints above and below the lesion is a familiar method. The Spanish surgeons, however, apply the plaster directly to the skin—in fact, to the wound, allowing only a light plugging of the wound with gauze. The aim is to exert perfectly even pressure on the surfaces. We regard this aim as pure theory and the plugging of the wound as promoting sepsis. We cover the wound with an aseptic dressing of gauze and then with wool, and apply the plaster over this dressing, using plaster bandages soaked in water mixed with formaldehyde, a precaution designed to destroy organisms in the plaster. We leave the plaster intact for several weeks. Again, to the Spanish surgeon the cutting of a window spells disaster, because it destroys the even pressure on the wound. We do not hesitate to cut a window when we suspect sepsis in the wound, any more than we refuse to open the dressing of a patient with a rising temperature, and increasing pain in the limb. Where we have done *incomplete operations* on certain battle fronts, working actually in the firing line, the plaster has been marked with a diagram to show where a window might be of use in keeping the wound under observation. We do not think that a window cut down on to a large dressing involves the danger of herniation of the wound; there is still room to slip a new dressing between the skin and the edges of the window. Herniation is produced by deep-seated infection, incomplete operation and faulty drainage, all of which require removal of the plaster to discover the underlying cause. We should have more to say on the place of fenestration in the treatment of wounds were we dealing with the treatment of infected wounds, and more especially with that of compound fractures, but we have limited this discussion to the question of recent wounds.

These are the principles in the use of immobilisation in plaster. In which cases is it of value? In muscular wounds we use plaster under two conditions—for very

---

[2] *Ibid*, p 106

und in gastritis and mucus is often excessive, both ay also be found in stomachs which appear normal at stroscopy and in which signs of inflammation are together lacking Hurst has pointed out that no-one ould consider making a diagnosis of tonsillitis without specting the tonsils, and that the sigmoidoscope is sential for the diagnosis of colitis Schindler (1937), ith vast experience, has classified gastritis according to astroscopic findings and we have used his classification , ut in every case so diagnosed direct evidence of an flammatory reaction in the gastric mucosa is considered essential for the diagnosis Thus in all cases ell marked injection and œdema of the mucosa, submucous hæmorrhages, superficial ulceration or well-marked turgescence and segmentation of the folds has een present Radiologically these cases have often hown definite changes in the form of stiffening and nlargement of the folds, and an increase of mucus In over half the cases of gastroscopic gastritis a radiological diagnosis of gastritis was made independently , in 7% of all cases examined the radiologist suspected gastritis which was not confirmed gastroscopically We are not certain of the significance of this and feel that it is possible that the radiologist in detecting alteration in the folds may be recognising a deep change in the mucosa which results from gastritis, but which shows no superficial signs of inflammation It is still possible that a normal gastroscopic appearance does not exclude disease The final criterion has however in all cases of gastritis been gastroscopic Only 5 cases included in this series as gastritis do not conform to the above standard In these the increase of adherent mucus between the folds without visible signs of inflammation was so striking that it was felt to be evidence of gastritis the acute phase of which had passed We have noted that some cases of superficial gastritis, while under treatment, have passed through this phase before becoming normal

Duodenitis —The diagnosis of duodenitis is essentially radiological but as will be shown later we have attempted with some success to confirm this diagnosis by other means Duodenitis has been included in other papers on evidence which seems to us vague and inconclusive , it appears to be used as a scrap-heap for doubtful duodenal disease To draw a line between the normal and abnormal condition of the mucosal folds is occasionally difficult, especially if experience is limited Here we press for full consideration of other aspects of the case, when a diagnosis will be made without much difficulty A detailed description of the radiological findings in duodenitis has been given by Cordiner and Calthrop (1936) The changes observed with the mucosal technique are characteristic, being stiffening and coarsening of the rugæ (as if they were œdematous) and in many cases irregularity of the pattern The screen appearance is one of continual activity of the muscularis mucosæ, and the contour of the cap is constantly changing The only stage of duodenal ulcer which is at all similar is the healing phase when there may be considerable activity of the muscularis mucosæ, but the rugæ always converge at a constant place If a convergence of the rugæ presents in duodenitis it is constantly changing its site This picture is by far the commonest in duodenitis, and the only one present in the cases here reported

Analysis of Material

PEPTIC ULCER

Peptic ulceration occurred in only 28 5% of cases This incidence is much lower than in any previous series and is not accounted for by selection, for the incidence in cases from units and from hospital was nearly the same Possible explanations seem to be that cases of duodenitis which give the appearance of deformity of the cap are called ulcer, and that cases of looped duodenum are also often confused with ulcer There were 6 cases of looped duodenum in this series which showed no ulceration or other disease and 4 cases among patients who had other organic lesions

Peptic ulceration occurred in 52 cases (23 9%) in the duodenum, in 5 cases (2 3%) in the pyloric canal, and in 5 cases (2 3%) in the stomach , 10 cases of duodenal scar are included in the cases of duodenal ulceration (8 of which were transferred from other hospitals). The average age of 30 3 years for duodenal ulcer and 29 2 years for pyloric ulcer contrasts with the average of 39 years in gastric ulcer This partly accounts for the rarity of gastric ulcer in soldiers, and places ulcer of the pyloric canal in the same ætiological category as duodenal ulcer

The accuracy of clinical diagnosis in peptic ulceration is greatest in the duodenal type, but much care is necessary in eliciting the history, and allowance must be made for the intelligence, the psychological make up, and the pain sensibility of the patient "Periodicity" of peptic ulcer type is in our experience the most valuable diagnostic point distinguishing ulcer from other forms of gastro-duodenal disease, but mistakes are often made in the case of patients with a neurotic disposition Further sources of error appear to be the coexistence of other organic diseases, for example gastritis Thus, of 39 cases in which a clinical diagnosis of duodenal ulcer was made confirmation was obtained in 25 (83%) , in 10 of the remaining 14 cases other duodenal disease was demonstrated

Apart from confirming the presence of gastric ulcer and noting its final healing, gastroscopic findings are chiefly of interest in this group in showing the incidence and type of associated gastritis , 60% of duodenal ulcers, 60% of pyloric ulcers and 80% of gastric ulcers had gastritis Of especial interest is the high incidence of chronic hypertrophic gastritis as already noted by Schindler (1937) 8 out of 42 duodenal ulcers, 2 out of 5 pyloric ulcers, 1 out of 10 duodenal scars

Secretion tests showed no features not already well recognised, but contrary to expectation only 3 out of 6 cases of duodenal ulcer with normal acid showed gastritis gastroscopically

GASTRITIS

Of our 217 cases 32%, with an average age of 28 years, showed evidence of gastritis gastroscopically as an isolated lesion The total incidence of gastritis is indeed far higher, for it was found in over half the other gastro-duodenal lesions Most of our cases were classified as superficial gastritis, showing œdema, hyperæmia, submucous hæmorrhages, superficial erosions, and a well-marked excess of mucus Only 4 out of 68 showed chronic hypertrophic gastritis as an isolated lesion, but as already mentioned 11 cases of this condition complicated peptic ulceration and 8 cases were associated with duodenitis There was 1 case of diffuse atrophic gastritis

Multiple superficial erosions, which are such a striking feature of gastritis, were present in 27 out of 55 cases of superficial gastritis, and it is noteworthy that they were an isolated finding three times as often in cases admitted from units as in those admitted from hospital (10 3) suggesting that they heal rapidly and occur in most cases of this type of gastritis at one time or another in acute exacerbations They appear gastroscopically as small shallow breaks in the mucosal surface closely resembling aphthous ulcers of the buccal mucosa Sometimes they are covered with a greyish slough, detachment of which leaves a raw surface Sometimes they are seen bleeding Not uncommonly small submucous hæmorrhages are also present It is possible that these develop into hæmorrhagic erosions which become covered with exudate and finally heal

That the observed condition of the mucosa is responsible for, and intimately related with, the clinical condition can of course be called in question We have attempted therefore to relate the clinical picture with the gastroscopic one, and to substantiate the findings by radiology and secretion tests The radiological examination always took place before gastroscopy so that the radiological diagnosis of gastritis was made quite independently The radiological criteria have already been discussed, and the possibility was mentioned that deep changes which might be significant were detectable by this means In 38 out of 69 cases radiological evidence of gastritis was found, and it is noteworthy that of 13 cases of erosions in which signs of a generalised gastritis were lacking only three showed radiological gastritis Thus while radiology cannot demonstrate all cases, many of those with negative radiological findings had lesions as striking as erosions

The ætiology of gastritis is even more obscure than that of ulceration That gastric irritants and stimulants of gastric secretion are factors seems probable but in most cases we do not think they are of great on which the various diagnoses are based We hope to draw attention to the high incidence of gastroduodenitis in the Services and to the particular problem which they present

The incidence of gastroduodenal disease in cases admitted direct from their units and in those transferred from other hospitals is shown below The incidence in both is almost the same and therefore there can be no question of special selection in either group We have not attempted to analyse the case-notes, numbering over 500, of all dyspeptics who have passed through this hospital, but have taken all admissions over a three months period as being sufficiently representative, these total 217 (130 from unit, 87 from hospital).

	Unit	Hospital	Total
Gastritis	41 (31)	28 (32)	69 (31)
Gastroduodenitis	13 (10)	9 (10)	22 (10)
Gastric ulcer	4 (3)	6 (7)	10 (5)
Duodenal ulcer	32 (25)	20 (23)	52 (24)
Duodenitis	8 (6)	5 (6)	13 (6)
Non organic	22 (17)	14 (16)	36 (16)
Miscellaneous	10 (8)	5 (6)	15 (7)

Percentages in parentheses

Organisation and Methods of Investigation

In May, 1941, the military authorities represented to the regional hospital officer that it might be advisable to collect certain types of dyspepsia in one hospital for special investigation The Director-General of the EMS agreed and special equipment and staff were allotted to this hospital We have been careful to select for analysis a three months period during which investigations performed were strictly comparable

Following the suggestion of Hurst (1941) we found that large numbers of cases of dyspepsia are most quickly passed through hospital, without sacrifice of accuracy, if there are separate wards for investigation, treatment and disposal, all under one sister No attempt is made to investigate cases of dyspepsia as outpatients, it being considered that investigation should either be thorough or not attempted at all, since an inconclusive result is of no value Liaison between the various members of the medical staff is close, and each case is reviewed, after investigation, by the clinicians and radiologist in consultation In the course of a few days, not more than 7 and often less, a positive diagnosis is achieved as a result of the procedure outlined below

A long and careful history is taken on a standard printed case sheet A complete examination including psychological assessment follows A clinical diagnosis is made in every case before any special investigations are done

The patient is at first given full diet, provided that his symptoms do not demand urgent treatment He is asked morning and night by the sister whether he has had pain during the preceding 12 hours, and this is recorded on his case sheet This is the most reliable guide to the patient's response to treatment

Occult blood is tested for in the stools after careful preparation on a diet of flavoured milk only, charcoal 3 g being used as a marker The benzidine test on an ether extract of stool is used, a definite blue colour appearing within 20 sec being considered positive

Fractional analysis, using gruel, is carried out in every case and any unusual result is confirmed by repeating the test Each examination lasts for three hours In cases showing hypochlorhydria the test has often been repeated in order to follow the effect of treatment on acid secretion Selected cases are examined for the secretion induced by histamine and insulin

Barium meal examinations are carried out on a tilting table The technique employed is the "mucosal relief" examination of Berg, introduced into this country by Cordiner and Calthrop and described by them with special reference to the duodenal cap By distributing a small quantity of barium emulsion in the valleys between the folds a relief of the inner surface of the stomach is obtained Radiograms are made under direct screen control, in the optimum position of the patient for demonstrating the various parts of the stomach and duodenum, and with the exact degree of compression necessary to bring the rugæ into relief As Cordiner and Calthrop have pointed out, much greater detail is visible on the film than on the screen Four exposures were made on each 8 in × 10 in film as this is the most economical size No ulcer is diagnosed unless the niche is shown on the film

The gastroscope used in the investigation of this series of patients is the model introduced by Hermon Taylor (1941), which has the great advantage over the Wolf Schindler instrument of controllable flexibility, with resultant improvement in vision and accuracy in diagnosis The patient is prepared for gastroscopy by preliminary starvation for 6 hours, morphia and atropine are given ¾ hour before instrumentation, and one 'Anethaine' (Glaxo) tablet is sucked in the mouth until it has dissolved, producing anæsthesia in from 10 to 15 min In the few patients in whom the preliminary introduction of the operator's index finger into the posterior pharynx produces retching a gargle of 2 c cm. of 2% anethaine is given in addition Routine preliminary gastric intubation for evacuation of the stomach has not been performed, and gastric lavage has only been necessary in one case in this series After gastroscopy nothing is given by mouth for 2 hours In no case has a more elaborate technique been used The length of the examination has varied according to the type of case, 10 min being usually sufficient for inspection of all areas of the stomach, but in some cases patience for as long as 25 min. may be rewarded by visualisation of an area difficult of access

We feel that in this series the best value has not been obtained from the occult blood test, it has often been omitted in order to avoid detention of the patient in hospital, or delayed until 10 days after admission Spectroscopic examination has not been possible.

Diagnostic Criteria

In order to decide the disposal of Service dyspeptics it is sufficient to support careful clinical assessment simply by radiology, using a mucosal technique, and gastroscopy The problem of dyspepsia, however, clearly goes beyond this Careful clinical observation and analysis are vitally important, the methods of investigation are so specialised that findings must constantly be reviewed clinically and the divorce of symptomatology and lesions avoided In view of the uncertainty of the final diagnoses in published cases, the criteria on which particular lesions were diagnosed in this series is now considered

Peptic ulcer —It might well be said that the difference between an ulcer and an erosion of the stomach is that in the former a niche can invariably be demonstrated radiologically, whereas in the latter it cannot The gastroscopist is in no doubt as to the distinction between ulcer and erosion and the X-ray findings can thus be verified in the stomach It follows therefore that duodenal ulcer should only be diagnosed when an ulcer crater can be demonstrated by X rays That it is justifiable to adopt this criterion is strengthened by the fact that the radiology of the duodenum is a more minute study where smaller lesions are much less likely to be missed (Cordiner) No radiologist can claim never to miss a duodenal ulcer, as his statement is impossible to prove A duodenal cap, however, was not pronounced normal in this series merely when no lesion was detected but only when the continuity of the mucosal folds was demonstrated radiologically and there was no deformation of the rugæ Since duodenal ulcers, even very small ones, produce some changes in the relief it is reasonable to assume that few, if any, ulcers are missed in so-called normal caps The demonstration of a niche is much more difficult in the grossly scarred and deformed caps of chronic ulcer cases, and the difficulty of excluding active ulceration in such cases must be borne in mind Scarring of this degree cannot however be attributed to anything but previous ulceration, and for the purpose of classification the diagnosis of duodenal ulceration stands The differentiation of duodenitis and duodenal ulcer is usually simple since the ulcers which most resemble this condition are of the acute and easily demonstrable type, and the search for an ulcer in an abnormal cap is always exhaustive Furthermore in duodenitis the changes in the cap do not centre about one point as they do in ulcer but are of a diffuse type In this series any cap not adequately demonstrated on radiograms was re examined until it was satisfactorily seen. Ulcer of duodenum and pyloric canal was only diagnosed therefore when a definite niche was demonstrated and in the stomach the ulcer was shown both radiologically and gastroscopically

Gastritis —This diagnosis should only be made on exacting criteria. Thus though achlorhydria may be found in gastritis and mucus is often excessive, both may also be found in stomachs which appear normal at gastroscopy and in which signs of inflammation are altogether lacking. Hurst has pointed out that no-one would consider making a diagnosis of tonsillitis without inspecting the tonsils, and that the sigmoidoscope is essential for the diagnosis of colitis. Schindler (1937), with vast experience, has classified gastritis according to gastroscopic findings and we have used his classification; but in every case so diagnosed direct evidence of an inflammatory reaction in the gastric mucosa is considered essential for the diagnosis. Thus in all cases well marked injection and œdema of the mucosa, submucous hæmorrhages, superficial ulceration or well-marked turgescence and segmentation of the folds has been present. Radiologically these cases have often shown definite changes in the form of stiffening and enlargement of the folds, and an increase of mucus. In over half the cases of gastroscopic gastritis a radiological diagnosis of gastritis was made independently; in 7% of all cases examined the radiologist suspected gastritis which was not confirmed gastroscopically. We are not certain of the significance of this and feel that it is possible that the radiologist in detecting alteration in the folds may be recognising a deep change in the mucosa which results from gastritis, but which shows no superficial signs of inflammation. It is still possible that a normal gastroscopic appearance does not exclude disease. The final criterion has however in all cases of gastritis been gastroscopic. Only 5 cases included in this series as gastritis do not conform to the above standard. In these the increase of adherent mucus between the folds without visible signs of inflammation was so striking that it was felt to be evidence of gastritis the acute phase of which had passed. We have noted that some cases of superficial gastritis, while under treatment, have passed through this phase before becoming normal.

Duodenitis.—The diagnosis of duodenitis is essentially radiological but as will be shown later we have attempted with some success to confirm this diagnosis by other means. Duodenitis has been included in other papers on evidence which seems to us vague and inconclusive; it appears to be used as a scrap-heap for doubtful duodenal disease. To draw a line between the normal and abnormal condition of the mucosal folds is occasionally difficult, especially if experience is limited. Here we press for full consideration of other aspects of the case, when a diagnosis will be made without much difficulty. A detailed description of the radiological findings in duodenitis has been given by Cordiner and Calthrop (1936). The changes observed with the mucosal technique are characteristic, being stiffening and coarsening of the rugæ (as if they were œdematous) and in many cases irregularity of the pattern. The screen appearance is one of continual activity of the muscularis mucosæ, and the contour of the cap is constantly changing. The only stage of duodenal ulcer which is at all similar is the healing phase when there may be considerable activity of the muscularis mucosæ, but the rugæ always converge at a constant place. If a convergence of the rugæ presents in duodenitis it is constantly changing its site. This picture is by far the commonest in duodenitis, and the only one present in the cases here reported.

Analysis of Material

PEPTIC ULCER

Peptic ulceration occurred in only 28.5% of cases. This incidence is much lower than in any previous series and is not accounted for by selection, for the incidence in cases from units and from hospital was nearly the same. Possible explanations seem to be that cases of duodenitis which give the appearance of deformity of the cap are called ulcer, and that cases of looped duodenum are also often confused with ulcer. There were 6 cases of looped duodenum in this series which showed no ulceration or other disease and 4 cases among patients who had other organic lesions.

Peptic ulceration occurred in 52 cases (23.9%) in the duodenum, in 5 cases (2.3%) in the pyloric canal, and in 5 cases (2.3%) in the stomach; 10 cases of duodenal scar are included in the cases of duodenal ulceration (8 of which were transferred from other hospitals). The average age of 30.3 years for duodenal ulcer and 29.2 years for pyloric ulcer contrasts with the average of 39 years in gastric ulcer. This partly accounts for the rarity of gastric ulcer in soldiers, and places ulcer of the pyloric canal in the same ætiological category as duodenal ulcer.

The accuracy of clinical diagnosis in peptic ulceration is greatest in the duodenal type, but much care is necessary in eliciting the history, and allowance must be made for the intelligence, the psychological make up, and the pain sensibility of the patient. "Periodicity" of peptic ulcer type is in our experience the most valuable diagnostic point distinguishing ulcer from other forms of gastro-duodenal disease, but mistakes are often made in the case of patients with a neurotic disposition. Further sources of error appear to be the coexistence of other organic diseases, for example gastritis. Thus, of 39 cases in which a clinical diagnosis of duodenal ulcer was made confirmation was obtained in 25 (83%); in 10 of the remaining 14 cases other duodenal disease was demonstrated.

Apart from confirming the presence of gastric ulcer and noting its final healing, gastroscopic findings are chiefly of interest in this group in showing the incidence and type of associated gastritis; 60% of duodenal ulcers, 60% of pyloric ulcers and 80% of gastric ulcers had gastritis. Of especial interest is the high incidence of chronic hypertrophic gastritis as already noted by Schindler (1937): 8 out of 42 duodenal ulcers, 2 out of 5 pyloric ulcers, 1 out of 10 duodenal scars.

Secretion tests showed no features not already well recognised, but contrary to expectation only 3 out of 6 cases of duodenal ulcer with normal acid showed gastritis gastroscopically.

GASTRITIS

Of our 217 cases 32%, with an average age of 28 years, showed evidence of gastritis gastroscopically as an isolated lesion. The total incidence of gastritis is indeed far higher, for it was found in over half the other gastro-duodenal lesions. Most of our cases were classified as superficial gastritis, showing œdema, hyperæmia, submucous hæmorrhages, superficial erosions, and a well-marked excess of mucus. Only 4 out of 68 showed chronic hypertrophic gastritis as an isolated lesion, but as already mentioned 11 cases of this condition complicated peptic ulceration and 8 cases were associated with duodenitis. There was 1 case of diffuse atrophic gastritis.

Multiple superficial erosions, which are such a striking feature of gastritis, were present in 27 out of 55 cases of superficial gastritis, and it is noteworthy that they were an isolated finding three times as often in cases admitted from units as in those admitted from hospital (10 : 3) suggesting that they heal rapidly and occur in most cases of this type of gastritis at one time or another in acute exacerbations. They appear gastroscopically as small shallow breaks in the mucosal surface closely resembling aphthous ulcers of the buccal mucosa. Sometimes they are covered with a greyish slough, detachment of which leaves a raw surface. Sometimes they are seen bleeding. Not uncommonly small submucous hæmorrhages are also present. It is possible that these develop into hæmorrhagic erosions which become covered with exudate and finally heal.

That the observed condition of the mucosa is responsible for, and intimately related with, the clinical condition can of course be called in question. We have attempted therefore to relate the clinical picture with the gastroscopic one, and to substantiate the findings by radiology and secretion tests. The radiological examination always took place before gastroscopy so that the radiological diagnosis of gastritis was made quite independently. The radiological criteria have already been discussed, and the possibility was mentioned that deep changes which might be significant were detectable by this means. In 38 out of 69 cases radiological evidence of gastritis was found, and it is noteworthy that of 13 cases of erosions in which signs of a generalised gastritis were lacking only three showed radiological gastritis. Thus while radiology cannot demonstrate all cases, many of those with negative radiological findings had lesions as striking as erosions.

The ætiology of gastritis is even more obscure than that of ulceration. That gastric irritants and stimulants of gastric secretion are factors seems probable, but in most cases we do not think they are of great can play a vital part in maintaining the morale and fighting spirit of the Army

During the course, officers are accommodated in the new mess which adjoins the school Instruction begins on Monday at 9 15 A M and continues till 5 P M daily, until Saturday which is a half day Each day there are six one-hour periods of lectures, demonstrations or practical work, with opportunities at the end of each for questions After 5 P M , time is allowed to write up notes and study references in the appropriate manuals

PRACTICAL TEACHING

Full-sized working models are provided not only of the standard types of all Army field sanitary appliances and camp lay-outs and structures but also of improvisations, adapted for any conceivable situation met with on active service in all parts of the globe These appliances include oil-and-water flash fire incinerators which use sump oil as fuel, and heaters, disinfectors and disinfestors of the latest Army patterns, also improvised types devised and constructed from materials scrounged from the countryside or from salvage dumps Sullage-water disposal plants include the standard type now installed in camps for the chemical treatment of sullage There are various devices for improving camp amenities, such as hot-water shower-baths, drying facilities for clothing, for use where no standard installations are available A section of a trench defence position with sanitary provisions installed has been constructed, and miniature hutted and tented camp lay-outs can be studied The tropical section includes an antimalarial lay-out in natural surroundings, and apparatus for anti-mosquito and anti-fly measures are comprehensive and ample For instruction in methods of water purification in the field, a water-point has been established, and water vehicles of all types are housed in closed garages where teaching can be carried out under any weather conditions The hygiene museums contain small models of water-purification and field sanitary appliances, and a well-fitted and amply stocked entomological laboratory enables insect vectors of disease to be examined in all stages of their development Problems of water-testing and water-purification are dealt with in the chemical laboratory Of the films used to illustrate lectures, four were made at the school—" The Louse," " The Housefly," " The Mosquito and Malaria " and " The Purification of Water in the Field "

SYNOPSIS OF LECTURES

The course begins with a lecture on military hygiene, setting out its aims, and explains the differences between civil and military hygiene The predominance of preventive medicine in military hygiene is stressed The care of the soldier and man-management is the subject of a special lecture in which it is emphasised that consideration and treatment of the soldier as a human being is the first essential The maintenance and improvement of the health of the soldier are taken in detail Accommodation and ventilation in relation to health with special reference to double-bunking and black-out problems are dealt with in demonstrations of devices now in use The preparation and cooking of the ration, with the conservation of its nutritious value and provision against vitamin deficiency are fully considered, together with the medical officer's responsibility for the inspection of food and of messing

A whole day is given to the purification of water-supplies in the field All types of Army water vehicles, apparatus and methods of clarification, filtration and sterilisation are demonstrated Each officer carries out water tests, including those for the detection of poisons, for which the medical officer is solely responsible within his unit The problems involved in the movement of troops by air, sea, rail, motor and on foot are discussed, since these movements may take place anywhere from the Arctic to the tropics This naturally leads to the prevention of disabilities due to climate, such as heat-stroke and frost-bite

The soldier's clothing, personal cleanliness, boots and feet are the concern of the medical officer, and a lecture on the methods of attack against disease teaches the value of medical inspections, and how Army methods and regulations may be used in the interests of hygiene An officer's responsibilities within a unit for hygiene, sanitation and conservancy are also defined Problems arising from contact infections such as venereal disease, scabies and tropical skin infections are discussed In the entomological department, demonstrations are given of measures against insect vectors in all stages of their development Films are used to illustrate lectures on the prophylaxis of louse-borne infections—typhus, trench fever—and the control of other pests, such as houseflies, mosquitoes, rats and fleas Appliances supplied to the Army overseas for the control of malaria and for disinfection and disinfestation are also demonstrated

Military prophylactic measures against intestinal infections are mostly concerned with the enteric and dysentery group, cholera and schistosomiasis Their diagnosis, how to deal with carriers, and inoculation technique are described together with propaganda for this method of protection

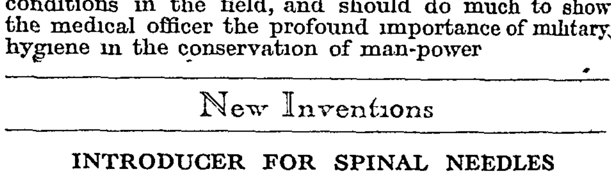
The course is kept up to date and in line with actual conditions in the field, and should do much to show the medical officer the profound importance of military hygiene in the conservation of man-power

---

New Inventions

INTRODUCER FOR SPINAL NEEDLES

THE needle and guide-introducer illustrated was designed for use in spinal and epidural anæsthesia The needle slides through its guide without side-play This aids the introduction of a fine Pitkin needle, preventing it from bending and keeping it on a straight path During insertion it is easy to feel the resistance of the various tissues through which the needle passes As in similar instruments, the needle, passing through its sterile guide, is protected from skin contamination The introducer has the following features



A sharp pointed tubular stem (A) for penetrating the skin and interspinous ligaments, similar to Sise's instrument, but shorter

A chuck which grips the needle when the screw head (B) is tightened, preventing it from moving backwards or forwards Thus, after the end of the needle has been introduced within the theca or epidural space and locked in position, subsequent manœuvres—connecting the syringe and barbotage—may be carried out without fear of dislodgment

Small projections (C) on which, during insertion, equal pressure is exerted by the thumbs This method facilitates introduction on the midline and is intended for use with the patient sitting, but it may also be used in the side position Alternatively, the guide may be held by its body (D), which is hollowed to provide an easy grip for finger and thumb

Before introduction the needle is locked in the introducer, its end just short of the point, and the two are inserted together The locking screw (B) is then loosened and the needle pushed on to its final position The screw is again tightened and the injection carried out

The introducer was made for me by Medical and Industrial Equipment Ltd , of New Cavendish Street, W 1, and is supplied with needles of 22 and 20 gauge

STANLEY ROWBOTHAM, M D Durh , D A
Major R A M C

SOCIETY OF APOTHECARIES OF LONDON —The Strickland Goodall memorial lecture in cardiology will be given by Dr William Evans on June 24 at 5 P M in the hall of the society, Black Friars Lane, London, E C 4

BRITISH PHARMACEUTICAL CONFERENCE —The annual meeting will be held at the Waldorf Hotel, Aldwych, London, W C 2, on Wednesday, July 22, at 10 30 A M, when Mr T E Wallis, F I C , will give his address Further information may be had from the hon secretaries, 17, Bloomsbury Square, W.C 1

GENERAL MEDICAL COUNCIL

SUMMER SESSION, JUNE 2–9, 1942

At the conclusion of the presidential address, reported last week (p 715), Sir Wilson Jameson and Admiral Wakeley were introduced to Mr Eason Later in the session the President announced the appointment of Frank Kane as direct representative for Ireland The appointment of a direct representative for England was deferred under the 1941 order

Charges against Medical Practitioners

The council considered a number of cases arising out of convictions for drunkenness without ordering the erasure of any name Nor did it direct the erasure of *John Neil Leitch*, registered as of 64, Great Cumberland Place, W 1, M R C S (1919) who had been summoned after conviction for obtaining credit without disclosing that he was an undischarged bankrupt Dr Leitch pleaded ignorance of the bankruptcy law

FALSE STATEMENT OF BIRTH REGISTRATION

The case of *George Macdonald Thomson*, registered as of 4, Hale Road, Mosman, Sydney, N S Wales, M B Sydney (1928), who had been summoned to appear before the council on the following charge

> That you were on March 23 1942 at the Kingston upon Thames Petty Sessions, convicted (after having pleaded guilty) of the following misdemeanour, namely, aiding and abetting May Thomson in making a false statement as to registration of birth, and were fined £10 and £5 18*s* 2*d* costs

Mr F P, Winterbotham, solicitor to the council, said that Mr Thomson had written to say he did not propose to attend, and called the detective-sergeant who had had charge of the case The sergeant stated that the respondent had reported the death of his infant daughter —apparently from suffocation in her cot—at his country home in Wiltshire Soon after his appointment to the Salisbury Infirmary he had introduced as his step-daughter a woman who shortly afterwards appeared pregnant After the death of the child it was surmised that this woman had been its mother, and the doctor had been asked for its birth certificate This showed it as the child of George Macdonald and May Thomson On inquiry the doctor and the woman had admitted that the child was not his wife's but his housekeeper's, and that false information had been supplied to the registrar Mrs Thomson had admitted knowledge of the events and stated that a nurse from a Kingston Hospital had accompanied the doctor when he went to Salisbury. Under pressure from her husband, Mrs Thomson had furnished the particulars to the registrar at Kingston The council announced that the charge had been found proved and then recalled the sergeant who stated that a three-year-old boy had been found living with the doctor in Wiltshire The boys birth certificate stated that he also was the child of respondent and Mrs Thomson, but Mrs Thomson had told the sergeant that she was not the mother of that child, the mother had been a hospital matron who had since died Proceedings in respect of this child could not be taken because the time limit had expired The council then directed the Registrar to erase Mr Thomson's name

ENABLING EVASION OF MILITARY SERVICE

The case of *George Anderson Mitchell*, registered as of 317, Horbury Road, Lupset, Wakefield, Yorks, M B Glasg (1924), who had been summoned to appear before the council on the following charge

> That being a registered medical practitioner
>
> (1) You on April 15 1941, at Wakefield in the County of York gave a certificate stating that John R Shakespeare was then suffering from bronchial asthma and was not able to resume his occupation and was unfit to travel such certificate being given by you for the purpose of enabling the said Shakespeare to evade his liability to military service (*a*) Such certificate was untrue, misleading or improper within the meaning of paragraph 1 of the Warning Notice issued by the General Medical Council dated June 1933 (*b*) You gave such certificate knowing that it was to be used in connection with the liability of the said Shakespeare to military service without making any or any proper professional inquiries before giving such certificate (*c*) You did not keep any or any proper record of the giving of such certificate
>
> ( ) You between April 15 1941 and March 4 1942 at Wakefield aforesaid gave thirty-eight certificates in reference to the said John R Shakespeare similar in terms to the certificate referred to in (1) above such certificates being given by you for the purpose of enabling the said Shakespeare to evade his liability to military service
>
> (3) You on Sept 9 1941, at Wakefield aforesaid gave a certificate stating that John R. Shakespeare was then suffering from asthma and bronchitis and was not able to resume his occupation, such certificate being given by you for the purpose of enabling the said Shakespeare to evade his liability to military service
>
> (4) You on Feb 25, 1942, at Wakefield aforesaid, gave a certificate dated March 4, 1942, stating John R. Shakespeare was then suffering from bronchial asthma and was not able to resume his occupation, such certificate being given for the purpose of enabling the said Shakespeare to avoid his liability to military service

In respect of charges (2) (3) and (4) it was alleged that such certificates were untrue, misleading or improper within the meaning of paragraph 1 of the Warning Notice, and that respondent had given them knowing that they were to be used in connexion with liability to military service, and without making any examination or any proper professional inquiries before giving such certificates In addition it was alleged that the certificate dated March 4, 1942, was issued without the doctor either seeing or examining Shakespeare on that date

Dr Mitchell attended, accompanied by Mr A A Pereira, counsel, instructed by Messrs Le Brasseur and Oakley solicitors, on behalf of the London and Counties Medical Protection Society Mr Bull, counsel for the General Medical Council, said that the four charges involved 39 certificates, but they all related to one man's liability for service in the Royal Air Force An inspector of the Wakefield city police had for many years known this man as a bookmaker, chiefly attending dog-race tracks Knowing him to be 26 or 27 years old he had made inquiries Shakespeare had been on the panel of two partners in the town At his medical board his examination had been adjourned for a week and he had, in the interval, called on his panel doctor He had been placed in grade II He visited respondent, for the first time, after receiving his call-up notice in April and had received the certificate mentioned in charge 1 At no time had respondent made inquiries of Shakespeare's panel doctor or of the medical board, and he had (admittedly) made no record of it Thereafter for nearly eleven months respondent had continued to issue certificates of unfitness for occupation, 14 of them adding that the man was unfit to travel Throughout this time Shakespeare had continued to act as a bookmaker and had been seen 17 times by the detective sergeant, he had also signed on at the labour exchange for 130 days, saying on 110 of these occasions that he had drawn 12 shillings for work Respondent and Shakespeare had travelled to the 1941 St Leger together in the doctor's car Inspector Buttery had arrested Shakespeare as an absentee, and he and Flight Lieutenant Fearnley had called on Dr Mitchell On examination at his unit Shakespeare had been passed fit Mr Bull read a letter from respondent admitting giving the certificates, saying he did not know Shakespeare had been placed in grade II and that he regarded the condition as one of bronchiectasis dating from infancy The patient had constantly shown dyspnœa and cyanosis and had been repeatedly examined He had taken Shakespeare to the races, but he had certainly not acted then as a bookmaker He had no record of any examination or certificate on March 4 He had always regarded Shakespeare's complaint as genuine and thought work injurious to his health, he had travelled against medical advice

Ac/2 John R Shakespeare testified to the facts as set out by counsel The first medical board had sent him home, saying they would get in touch with his doctors He had not known Dr Mitchell before April 15, on that date he had visited him, complaining of feeling ill, and had received a certificate and paid a fee of 3*s* The RAF headquarters had told him he must send a weekly certificate and he had visited Dr Mitchell every week or two up to March 3 He had never had more than one certificate at a time He thought he had paid a bill of about £2 some time this year That and the initial 3*s* was all he had ever paid The doctor had never asked what his occupation was At the first visit he had told the doctor he had been before a medical board but the grade had not been mentioned He had told Dr Mitchell the names of his panel doctors They had discussed racing matters from time to time He had not been to a race meeting, except the St Leger, in 1941 He had worked about two days a fortnight for a bookmaker, and had gone to the labour exchange to get money They had never found him work so the question of his ability to take it had never arisen Cross-examined by Mr Pereira, he said he had had chest trouble since he was 22, and had been treated from that time He puffed and spat a lot The trouble had been practically continuous After ten days in the RAF he had gone to hospital with pneumonia, and had been there seven or eight weeks After that he had been in a convalescent home for three weeks and had only left there five days ago He had thus only been at his station about a fortnight altogether, and had not yet been paraded as fit He had done no work for the RAF Dr Mitchell had attended his wife and daughter, the daughter had been in bed *three weeks with tonsillitis At the first* visit the doctor had made him strip to the waist and had investigated his chest, back and front, and asked questions He had not felt at all well, and had told of his coughing, difficulty in breathing and depression He had not felt fit to travel Evidence was also given by Inspector J. Buttery, detective-sergeant N Murray, Flight-Lieutenant J A Fearnley, Dr J A M R Heron, Squadron-Leader H B Hunt and Mr A Wainwright Dr Heron said that Shakespeare had become his patient in August, 1940, and had not so far withdrawn his card He had last seen him *on Feb 18, 1941, the patient had* shown slight signs of nasal catarrh but no condition that would justify a certificate to free him from military service He had asked for a certificate that he had chronic bronchitis and was not fit to serve, he had not been pleased when the certificate was refused Squadron Leader Hunt said he was a postgraduate scholar in asthma research He had examined Shakespeare on March 18, 1942, with the aid of X rays and a blood sedimentation test Shakespeare had mild bronchitis but there was no evidence of bronchial asthma, he was *fit for military service On March 26 he had developed* pneumonia, but had made an uninterrupted recovery The pneumonia had no connexion with the bronchitis

Respondent testified that when he had first seen Shakespeare the patient had said a medical board had found something wrong and he had wanted a certificate to satisfy the authorities that his incapacity continued Dr Mitchell had thoroughly examined him and had found him in a state of great respiratory distress, he gave a history of chest trouble from early childhood, and the doctor concluded that he suffered from chronic *bronchitis associated with acute attacks of asthma* Some of the certificates indicated that on the occasions they covered Shakespeare had bronchial catarrh He had not known that Shakespeare was a bookmaker, and had no idea he was trying to evade military service The certificates were based on medical grounds He had asked about the panel and Shakespeare had said he had nothing to do with it He had made no further inquiries A member asked what treatment Dr Mitchell had ordered Respondent replied that he had advised him on general lines, but had not known how he was spending his time, he had assumed that he was unemployed and regarded him as unfit for any employment, except clerical work

After consideration in camera the President announced *that the Registrar had been directed to erase the name*

WRONGFUL CERTIFICATION WITHOUT ERASURE

The case of *Patrick Joseph Molloy*, registered as of 315, Hoe Street, London, E 17, M B N U I (1926), who had been summoned to appear before the council on the following charge

That being a registered medical practitioner you did on Sept 2, 1941, and at approximately weekly intervals thereafter until Nov 10, 1941, give certificates, known as war injury continuation incapacity certificates, in your professional capacity for subsequent use for administrative purposes under the Personal Injuries (Emergency Provisions) Act, 1939, in the case of A E D Aitchison, of 63, Rowland Road, Wood Street, Walthamstow, whereas you had not seen or examined the said A E D Aitchison either on Sept 2, 1941, or on any of the other dates on which you gave the said certificates, or at all between Sept 2 and Nov 10, 1941, and the said certificates were accordingly untrue, misleading, and improper

And that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect

Dr Molloy attended Complainants were the Ministry of Pensions Mr Winterbotham explained that the patient had been in the Connaught Hospital from Aug 8–12, 1941, unable to work owing to an injury to his arm, he had been discharged cured Dr Molloy said that the patient had come under his professional care on Aug 19 He had been in error over the form of the certificate He had seen the patient when he had come from the Connaught Hospital, his recollection was that he had advised the patient some time after he had come from the hospital to go away and have a rest He thought he had seen him between Aug 12 and 31, but had no record

The President, after the council had found the charges proved to their satisfaction, said that the council took a grave view of culpable laxity in giving medical certificates, which might result in injury to the recipient, to others and to the state, but which certainly injured the repute of the profession of medicine Dr Molloy had admitted the facts alleged against him and that he did not read the text of the certificates properly before signing them His statements might serve to explain how the false certificates came to be framed and attested, but did not exonerate him from the charge of reprehensible carelessness, which might amount to infamous conduct in a professional respect Believing, however, that he had very imperfectly realised his professional responsibilities, and that the proceedings might serve as an effective warning to him, the council had decided to postpone judgment for twelve months during which time they trusted that he would take more care in the issue of certificates, and that there might be no further complaint against him

ALLEGED WRONGFUL CERTIFICATION

The case of *Joseph Edward Naftalin*, registered as of 79, Gray's Inn Road, London, W C 1, M B Glasg (1928), who had been summoned to appear before the council on the following charge

That being a registered medical practitioner

(1) *You gave the following certificate, dated February 25, 1942,* in your professional capacity for subsequent use for administrative purposes in the Casualty Services of the Metropolitan Borough of Finsbury in the case of Mr W P Abbott, an employee of the Council of the Metropolitan Borough

25 2 42

This is to certify that Mr W P Abbott residing at 15, Doughty St, W C, is suffering from gastritis and is unable to follow his occupation J E Naftalin

Dr J E Naftalin, 79, Gray's Inn Road, W C 1
6871

(2) You had not seen or examined the said Mr W P Abbott on Feb 25, 1942, or at any material time before Feb 27, 1942, when he was seen by you and the said certificate was accordingly untrue, misleading, and improper

And that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect

Respondent was accompanied by Mr Oswald Hempson, solicitor, acting on behalf of the Medical Defence Union Complainants were the Finsbury Metropolitan Borough Council Mr Winterbotham called Mr H A Hartridge, a shift-leader of the council's defence services, who said that Abbott had reported for duty on Feb 27 after an absence of two days He had told Abbott that before he could be allowed to resume work he must produce a medical certificate Two hours later Abbott had returned with the certificate which was the subject of the charge, saying he had seen a doctor The purpose of the certificate was to show the reason for his absence Dr K Sinclair-Loutit, the medical officer of the service, said that certain employees, including Abbott, had too often produced medical certificates of illness at times which extended their periods of leave, and he had been *instructed to exercise stricter supervision* over medical certificates Abbott had an extensive and complicated sickness record that had aroused the witness's suspicions On Feb 27 the certificate Abbott produced was at once brought to his notice, and *after he had questioned* Abbott at some length Abbott had signed a statement that on Feb 25, when he had not reported for work, he had not been ill and that on Feb 27 he had explained to his doctor that he had had indigestion which had been righted by a purge and had obtained the certificate The medical officer added that he had asked Abbott whether he had been sick on the 25th and he had answered no, he had overslept Mr E W Finch, the officer in charge of civil defence works, confirmed Mr Hartridge's evidence

Mr W P Abbott, a young Canadian, said he had not worked on Feb 25 but had returned on the 27th The statement he had signed at the medical officer's dictation was not true He did not know why he had signed it, he was so mixed up in other affairs that he had become mixed up in this one as well He lodged at Aggrey House, in a basement room formerly occupied by a man

On Feb 25 he had woken up late, after occupants of the room had left He felt ill all day in the hostel Dr Naftalin had come room and—though the witness had not expected examined him, felt his pulse, and " done a other things I have no idea of, the usual things " had then told the doctor he thought he was a mistake and that he really ought to be examin- Stewart, who was in bed ill in another room The had told him to take care of himself and had gone The doctor often attended men in the club and quite well known to the witness When told on 27 to bring a certificate, Abbott had gone to the who had again examined him and given him a of medicine He had paid for the certificate but not remember how much He had consulted him before that date and once afterwards

Dr Naftalin said he was in the habit of attending at Aggrey House and would constantly walk and out, his visits were partly social and partly and he usually charged no fee On Feb 25 had been asked to see a man ill in bed and had to find him in the room actually occupied by , he had therefore thought Abbott was the Abbott had been sitting looking ill and in front of the fire He had examined him found feverish symptoms and evidence of some trouble, which at that time had been epidemic had told Abbott to take care of himself as he was not Abbott had been rejected for the RAF and had general health Abbott then had remarked that thought the doctor had examined the wrong man Feb 27 Abbott had asked him for a certificate and doctor had predated it to the day when he had Abbott This he considered a perfectly ate thing to do He remarked in answer to the that in his opinion, under present conditions, of certificates were perforce inaccurate they varied in their statements that the patient had been ill at a given date or was ill at the date of certifying Much pressure was put on medical practitioners to certify persons who had not seen a doctor when they were ill

Mr R A Franks said he was assistant secretary at Aggrey House, a hostel primarily for West Indian and colonial students, but now open to troops from overseas He confirmed Dr Naftalin s account of his to the hostel, he had asked him to see Stewart, who had recently moved from Abbott's room

The President, after consideration in camera, announced the council had not found the charge proved to its satisfaction

ERASURES AFTER LEGAL CONVICTIONS

The case of *Alexander Gordon Bonnyman*, registered as of 191, Barking Road, Canning Town, E 16, M B Edin (1927), convicted at the Central Criminal court of unlawfully killing Elizabeth Galloway Bonnyman, and sentenced to twelve months' imprisonment Mr Winterbotham set forth the facts, and Dr Bonnyman explained that he and his wife had both been morphia addicts She had never obtained morphia on prescriptions from him, nor had he administered it to her or taught her its use

The case of *Patrick Joseph Conlin*, registered as of c/o Lloyds Bank, Ltd, Cardiff, M B N U I (1920), who after being charged with drunkenness when on active service, found guilty by a court martial and dismissed the service had exercised his right to present a petition against the sentence

The case of *Ronald James Eadie*, registered as of Heathfield, Crieff, M B Glasg (1934) convicted in Edinburgh High Court of acts of indecency (heard in camera)

The case of *Erich Hohenberg*, registered as of 27, Beverley Court, Wellesley Road, London, W 4, L R C P E (1940) convicted at Marlborough Street police-court of receiving a book (" A History of Architecture " value £1 15s), knowing the same to have been stolen or unlawfully obtained, and sentenced to four months' imprisonment Respondent did not attend Mr Winterbotham explained the facts Mrs Hohenberg testified that she had suffered from kleptomania since her childhood, and detailed the trouble her habits had occasioned to her parents It was she who had stolen the book from the shop where she was employed

The case of *Seweryn Kaminski* registered as of 218, Renfrew Street, Glasgow, M D Warsaw (1923), convicted in the court of the Sheriffdom of Lanark of procuring abortion

The case of *William Spencer Lewis*, registered as of 96, Redcliffe Gardens, South Kensington, London, S W 10, L S A (1904), convicted at Surrey assizes with unlawfully using an instrument with intent to procure a miscarriage and other similar offences.

The case of *Brendan O'Carroll*, registered as of (R A M C) 309th H A A Battery, R A, 183, Orby Drive, Castlereagh Road, Belfast, L A H Dubl (1937), convicted at the Halesowen petty sessions of being in charge of a motor-car whilst under the influence of a drug Dr Carroll did not attend, but Mr Winterbotham said he had written saying that he was a drug addict and it would be best if his name were erased

The case of *John Knox Thompson*, registered as of 30, Princes Road, Liverpool, M B R U I (1908), convicted of interfering with persons in His Majesty's Service and attempted false pretences

Medical Education in War-time

Lieut -General H LETHEBY TIDY, R A M C, chairman of the Joint Education and Examinaton Committee, told the council that the Minister of Health had forwarded a recommendation of the Medical Personnel (Priority) Committee that, as a matter of emergency, the council should modify their resolution of 1933, that the minimum period of continuous clinical study, after completion of professional examinations in anatomy and physiology, should be three calendar years The personnel committee proposed that a student who produced evidence that he had completed the whole of the curriculum after not less than 30 months of certified clinical studies should now be admitted by licensing bodies and examining boards to qualifying examinations The minister had intimated to the council that he concurred generally with the recommendation of the personnel committee, and Dr Tidy said that his committee was satisfied that, under war conditions, it was not in the public interest for the council to offer objection to any departure of this extent by bodies and boards from their normal requirements for qualification His committee would like the council to arrange as soon as possible for an inspection of qualifying examinations held under the shortened curriculum

The President and Sir John Stopford both made it clear that this was not a recommendation to the licensing bodies but a request that they should consider, in the light of the national necessity and the position in their localities, whether they could speed up the course without lowering standards If any licensing body thought fit to do so, then—provided that the period of clinical studies did not fall below 30 months, the standard was not lowered, and the examinations were visited as soon as possible—the council would not stand in the way On this understanding the committee's recommendation was adopted unanimously

The Pharmacopœia

Prof DAVID CAMPBELL, presenting the report of the Pharmacopœia Committee, thought the Council might be surprised to learn that no copies of the BP 1932 had been sold during the year, for the reason that the book was out of print It was an important book of standards, essential for pharmacists and pharmaceutical students, the difficulty had been to obtain enough paper, but his committee now hoped to print copies before October. The BP Commission had reported the publication of the Fifth Addendum to the BP 1932, which had become official on May 15 This addendum contained formulæ for concentrated extracts to take the place of preparations containing alcohol Their use had been authorised by the Ministry of Health in a Scarce Substances Order issued under the Defence (General) Regulations A considerable economy in the alcohol required in other departments of the war effort should thus be effected Opportunity had been taken to recognise Indian belladonna as a substitute for the European variety, which was now very scarce, and to extend the specification for menthol to include synthetic varieties to replace the natural product which could not now be obtained from Japan

Public Health Examinations

The Report of the Public Health Committee, presented by Dr JOHN RITCHIE, contained observations by licensing bodies on the council's report on its 1938–39 visitation of DPH examinations Manchester was against over-elaboration of the test, leading the student to cram unduly to cope with the mass of detail A candidate could not in one session become a skilled bacteriologist, statistician, parasitologist and clinician, and an expert on nutrition, sanitary construction and law He should acquire a working knowledge of the more important aspects of these subjects, the examination should not aim to test detailed and extensive knowledge of them all. In particular, Manchester does not regard it as necessary to specify more than two papers for the first part of the examination, or to extend the practical examination in bacteriology over two days, or to have a separate paper on vital statistics If the examination is to be elaborated, the syllabus should be reduced The important thing is to train candidates and assess their quality, not their ability to disgorge detail St Andrews also regarded separate papers in each branch as undesirable, and vital statistics unworthy of a special paper

Reviews of Books

Spontaneous and Experimental Leukæmia in Animals

JULIUS ENGELBRETH-HOLM, M D, director of the Cancer Research Laboratory of the Danish Anti Cancer League, chief pathologist of Finsen Institute, Copenhagen Edinburgh Oliver and Boyd Pp 245 15*s*

THIS volume, published under the authority of the Lady Tata Memorial Trust which has given support to research work in leukæmia and other blood diseases since 1932, is a review of our present knowledge of leukæmia in animals, and touches on the human disease hardly at all The published work is scattered, often contradictory and confusing to anyone approaching the subject freshly The author has wisely adopted a historical arrangement which allows the growth of knowledge to be systematically presented, and the result is a readable and complete survey A concise account of the various leukæmias that have been found in animals is given, and then there is a description of the experimental work which has shown their transmissibility in fowls and rodents, and the virus-like nature of the leukæmia agent in birds This is all fairly well known, but Dr Engelbreth-Holm then goes on to describe the more recent work on the part heredity plays in susceptibility, and on the possibility of inducing immunity to experimentally transmitted leukæmia He seems doubtful of claims that leukæmia can be induced by carcinogenic agents such as tar, and thinks that many such cases were only "leukæmoid states" Finally he shows himself a strong supporter of the view that animal leukæmia is neoplastic in nature and that animal and human leukæmia are closely related even if some cases in humans are "not fully neoplastic" Many odd facts appear in these pages leukæmia has been detected in turkeys, vultures, sea-lions, elephants, and opossums, fowl leukæmia has a world-wide incidence 0 00 001 c cm of a leukæmia-cell suspension is sometimes sufficient to transmit the disease, spontaneous remission and recovery sometimes takes place after successful inoculation of leukæmia in fowls, plasma-cell leukæmia is limited to humans Every worker on the subject will want this book on his shelves for reference The translation from the Danish has been very well done by Mr C L Hull

Acute Injuries of the Head

G F ROWBOTHAM, F R C S Edinburgh E and S Livingstone Pp 288 25*s*

THIS, the best book on acute head injuries which has yet come out of Britain, has the additional virtue of being written by a single author with wide experience He writes with just enough informality to make his subject appear fairly simple, and the whole field is covered, some parts more fully than others but without serious omissions The chapters on anatomy and pathology are adequate, and although the expert may think them over-simplified, in a manual of this kind that is an error in the right direction The clear instructions for treatment in the acute stage and during convalescence will be among its chief attractions for newly qualified practitioners, as well as for those older men who have to deal only occasionally with head injuries Perhaps more might have been said about the diagnosis of chronic subdural hæmatoma, many such cases must die every year for want of diagnosis and a simple operation

Cardiac Clinics

F A WILLIUS, M D, head of section of cardiology, Mayo Clinic London Henry Kimpton Pp 276 20*s*

THIS collection of informal discussions at staff meetings of the Mayo Clinic is meant to solve, where the textbook fails, some of the practical problems of busy practitioners About half the contents are short talks on topics ranging from cardiac murmurs to the science and art of medical practice, in the other half, cases representing cardiac lesions are described, most of them common, but some rare The book is admittedly not meant to incorporate all recent advances, but surely the time has come to include teaching on the distinction between coronary thrombosis and cardiac infarction, and to give more exacting criteria in the diagnosis of infarction than inverted T waves and anginal pain? Professor Willius, however, presents much sound instruction

Pathology and Treatment of War Wounds

ALMROTH E WRIGHT, M D, F R S, director of the inoculation department and principal of the Institute of Pathology and Research, St Mary's Hospital London Heinemann Pp 208 21*s*

SIR Almroth has had the happy idea of bringing together the papers on war wounds which he wrote in the last war—several of them appeared in our own columns—and with this venture the committee of the inoculation department of St Mary's Hospital associate themselves Lord Iveagh and Sir Max Bonn, inditing a prefatory note as founder members of the department, remark on the achievement of its fundamental aim in closely linking laboratory research with the treatment of patients The papers are a fitting reminder of the debt we owe, in this war, to our laboratory workers in the last

Year Book of Industrial and Orthopædic Surgery 1941

Editor CHARLES F PAINTER, M D, orthopædic surgeon to the Massachusetts Women's Hospital and Beth Israel Hospital, Boston Chicago Year Book Publishers, London H K Lewis Pp 432 16*s* 6*d*

IN the second year of publication of this new addition to the Year Books series the publishers continue to recognise the common interests of orthopædic and accident surgery The book is a pocket edition Over half the 1940 literature reviewed deals with orthopædic surgery, the rest covers fractures and dislocations, industrial medicine and surgery Dr Painter's judgment ensures the scientific value of the volume

The Body as a Guide to Politics

WALTER B CANNON, George Higginson professor of physiology, Harvard Medical School London Watts and Co ("The Thinkers' Forum," No 15) Pp 47 6*d*

THE application to the body politic of what every biologist knows to be the responses of living organisms to alterations in environment is not a new idea, but Professor Cannon introduces novel features into the treatment The maintenance of the constancy of the internal environment, first outlined by Claude Bernard, and latterly considerably expanded and expounded by Cannon under the name of "homeostasis," may well be taken to heart by politicians Stability is more important than economy in the upkeep of the body, as in the preservation of the life of the state What corresponds in a nation to the internal environment of the body is the whole intricate system of production and distribution of merchandise Thorough cooperation of all functional groups is essential, and only by social stability can security, freedom and proper progress be reached It may be regretted that so few of our political leaders have acquaintance with biology, since it is ultimately with biological phenomena that they have to deal, and in the difficult times that yet lie ahead of us it would be well if some of the precepts outlined in this very readable little book could be borne in mind

THE LANCET

LONDON SATURDAY, JUNE 20, 1942

THE PLAN ON THE TABLE

The Medical Planning Commission established by British Medical Association has drafted an interim which is circulated this week by the *British Journal* as a basis for discussion by the bodies ed on the commission and by the medical on generally The commission, established in , 1940, set out to study war-time developments their effects on the country's medical services, present and future Five subject committees met on 31 occasions and their reports have been ted by a sixth coordinating committee, which ted one composite document to the commission May 29 This document is now offered for com- and criticism before the commission completes interim report for submission to the Government

FIBROBLASTS

THE fibroblast does more for the integrity of the than all the advocacy of Field-Marshal ts and the late J S HALDANE, its function, in is to prevent the Organism-as-a-Whole from apart It performs this function so unobtru- that the surgeon is hardly aware of the fibro- except as a potential nuisance There are no occasions on which fibroblasts have to be encouraged to grow, the problem is how to suppress them when their growth becomes unduly abundant does not take malignant growth into account ically speaking benign proliferations like are essentially fibroblastic, so are the ons that form on the surface of wounds that to heal by simple closure Fibroblasts normally a disperse tissue in the body—they are separated one another by cells of another type They however form secondary epithelia, as they do the so called endothelial lining of the blood-vessels Fibroblasts in the body can be divided into topographical races Those derived from periosteum and bone, cardiac and skeletal muscle, from connective tissues in general, and from the dermal layer of the skin are physiologically, distinct, since they behave in different ways on cultivation, and probably genetically distinct, since they tend to preserve their racial differences in a modified form even after prolonged cultivation The fibroblast itself can be regarded as the archetype of the mesenchyme cells the body It is an elongated triangular or spindle- u cell which moves by pseudopodia, reproduces by simple mitotic division, and joins up with its neighbours by fine cytoplasmic processes It is not phagocytic Internally, the fibroblast can almost be described as a "typical cell," as the cytologist understands the term This is not surprising, since a fair proportion of what is known of the characteristics of cells in general is based on the study of fibroblasts

There is abundant evidence from tissue-culture that fibroblasts and epithelial tissues are antagonistic to one another, and that epithelia do not spread so readily when fibroblasts are growing exuberantly as they do when fibroblast growth is artificially suppressed In healing by secondary intention, the fibroblast may easily become a nuisance, particularly when the fibroblast reaction is aggravated by long-standing infection It is probably wrong, however, to regard the epithelium of the skin as a delicate and fragile tissue As far as remaining alive under adverse conditions is concerned, it is probably the most resistant in the body Unfortunately, epithelialisation does not depend on the mere survival of epithelia, but on their multiplication and above all their amœboid spread over the surface of the wound The spreading reaction is only too easy to impede, and swollen granulations probably offer a simple mechanical obstacle The problem of suppressing fibroblast growth and not that of epithelia has not yet been solved But it is possible that some now favoured wound dressings which are supposed to give good results because they are bland and inert actually favour the growth of epithelia at the expense of fibroblasts Most organic oils, for example, contain water-soluble surface-active matter (e g, fatty acids) as natural impurities, and surface-active substances are known to retard fibroblast growth in tissue culture at concentrations at which they are without appreciable effect on epithelia[1] The inhibitory substance in malt and grain described by HEATON[2] and MEDAWAR[3] belongs to a different category but exerts a much stronger effect of the same sort Tissue-culture experiments with the crude extracts so far used show that it can totally suppress fibroblast growth at concentrations at which it is either without effect on, or indirectly favours, the growth of epithelia It remains to be seen whether this property can be turned to good account clinically

Fibroblast reactions, or reactions for which fibroblasts are primarily responsible, are brought about by stimuli other than those grouped together under the heading of "irritation" It is well known that the internal pattern of bone almost exactly corresponds to the stresses and strains to which a particular bone is subjected Fibroblasts certainly orientate themselves under stress, even when the stress is in a system of ultramicroscopic organisation like clotted blood-plasma[4] It is possible, moreover, that the formation of collagen and other inert matter is stimulated by stress forces The stress-reaction of fibroblasts might almost be called the physiological foundation of bone surgery, but in the surgery of nerves it is coming to be regarded as a possible menace British surgeons regard end-to-end suture as the method of choice for repairing lesions of peripheral nerves Since a divided nerve leaves a gap by retracting under its own tension, and since this gap is increased when sufficient of the stumps has been resected to expose healthy nerve bundles at either end, it is the rule even for primary sutures to be made under tension Recent evidence[5] shows that collagenisation is directly or indirectly stimulated in nerves under severe tension, and that stretching a taut nerve which has been sutured in the position

---

[1] Katzenstein A and Knake, E *Z Krebsforsch* 1931 33 378
[2] *J Path Bact* 1926 29 293 1929 32, 565
[3] *Quart J exp Physiol* 1937 27 147
[4] Weiss P *J exp Zool* 1931 68 393
[5] Highet W B and Holmes W Highet and Sanders F K In the press

Public Health Examinations

The Report of the Public Health Committee, presented by Dr JOHN RITCHIE, contained observations by licensing bodies on the council's report on its 1938–39 visitation of DPH examinations Manchester was against over-elaboration of the test, leading the student to cram unduly to cope with the mass of detail A candidate could not in one session become a skilled bacteriologist, statistician, parasitologist and clinician, and an expert on nutrition, sanitary construction and law He should acquire a working knowledge of the more important aspects of these subjects, the examination should not aim to test detailed and extensive knowledge of them all In particular, Manchester does not regard it as necessary to specify more than two papers for the first part of the examination, or to extend the practical examination in bacteriology over two days, or to have a separate paper on vital statistics If the examination is to be elaborated, the syllabus should be reduced The important thing is to train candidates and assess their quality, not their ability to disgorge detail St Andrews also regarded separate papers in each branch as undesirable, and vital statistics unworthy of a special paper

Reviews of Books

Spontaneous and Experimental Leukæmia in Animals

JULIUS ENGELBRETH-HOLM, M D, director of the Cancer Research Laboratory of the Danish Anti Cancer League, chief pathologist of Finsen Institute, Copenhagen Edinburgh Oliver and Boyd Pp 245 15s

THIS volume, published under the authority of the Lady Tata Memorial Trust which has given support to research work in leukæmia and other blood diseases since 1932, is a review of our present knowledge of leukæmia in animals, and touches on the human disease hardly at all The published work is scattered, often contradictory and confusing to anyone approaching the subject freshly The author has wisely adopted a historical arrangement which allows the growth of knowledge to be systematically presented, and the result is a readable and complete survey A concise account of the various leukæmias that have been found in animals is given, and then there is a description of the experimental work which has shown their transmissibility in fowls and rodents, and the virus-like nature of the leukæmia agent in birds This is all fairly well known, but Dr Engelbreth-Holm then goes on to describe the more recent work on the part heredity plays in susceptibility, and on the possibility of inducing immunity to experimentally transmitted leukæmia He seems doubtful of claims that leukæmia can be induced by carcinogenic agents such as tar, and thinks that many such cases were only "leukæmoid states" Finally he shows himself a strong supporter of the view that animal leukæmia is neoplastic in nature and that animal and human leukæmia are closely related even if some cases in humans are "not fully neoplastic" Many odd facts appear in these pages leukæmia has been detected in turkeys, vultures, sea-lions, elephants, and opossums, fowl leukæmia has a world-wide incidence, 0 00 001 c cm of a leukæmia-cell suspension is sometimes sufficient to transmit the disease, spontaneous remission and recovery sometimes takes place after successful inoculation of leukæmia in fowls, plasma-cell leukæmia is limited to humans Every worker on the subject will want this book on his shelves for reference The translation from the Danish has been very well done by Mr C L Hull

Acute Injuries of the Head

G F ROWBOTHAM, F R C S Edinburgh E and S Livingstone Pp 288 25s

THIS, the best book on acute head injuries which has yet come out of Britain, has the additional virtue of being written by a single author with wide experience He writes with just enough informality to make his subject appear fairly simple, and the whole field is covered, some parts more fully than others but without serious omissions The chapters on anatomy and pathology are adequate, and although the expert may think them over-simplified, in a manual of this kind that is an error in the right direction The clear instructions for treatment in the acute stage and during convalescence will be among its chief attractions for newly qualified practitioners, as well as for those older men who have to deal only occasionally with head injuries Perhaps more might have been said about the diagnosis of chronic subdural hæmatoma, many such cases must die every year for want of diagnosis and a simple operation

Cardiac Clinics

F A WILLIUS, M D, head of section of cardiology, Mayo Clinic London Henry Kimpton Pp 276 20s

THIS collection of informal discussions at staff meetings of the Mayo Clinic is meant to solve, where the textbook fails, some of the practical problems of busy practitioners About half the contents are short talks on topics ranging from cardiac murmurs to the science and art of medical practice, in the other half, cases representing cardiac lesions are described, most of them common, but some rare The book is admittedly not meant to incorporate all recent advances, but surely the time has come to include teaching on the distinction between coronary thrombosis and cardiac infarction, and to give more exacting criteria in the diagnosis of infarction than inverted T waves and anginal pain? Professor Willius, however, presents much sound instruction

Pathology and Treatment of War Wounds

ALMROTH E WRIGHT, M D, F R S, director of the inoculation department and principal of the Institute of Pathology and Research, St Mary's Hospital London Heinemann Pp 208 21s

SIR Almroth has had the happy idea of bringing together the papers on war wounds which he wrote in the last war—several of them appeared in our own columns—and with this venture the committee of the inoculation department of St Mary's Hospital associate themselves Lord Iveagh and Sir Max Bonn, inditing a prefatory note as founder members of the department, remark on the achievement of its fundamental aim in closely linking laboratory research with the treatment of patients The papers are a fitting reminder of the debt we owe, in this war, to our laboratory workers in the last

Year Book of Industrial and Orthopædic Surgery 1941

Editor CHARLES F PAINTER, M D, orthopædic surgeon to the Massachusetts Women's Hospital and Beth Israel Hospital, Boston Chicago Year Book Publishers, London H K Lewis Pp 432 16s 6d

IN the second year of publication of this new addition to the Year Books series the publishers continue to recognise the common interests of orthopædic and accident surgery The book is a pocket edition Over half the 1940 literature reviewed deals with orthopædic surgery, the rest covers fractures and dislocations, industrial medicine and surgery Dr Painter's judgment ensures the scientific value of the volume

The Body as a Guide to Politics

WALTER B CANNON, George Higginson professor of physiology, Harvard Medical School London Watts and Co ("The Thinkers' Forum," No 15) Pp 47 6d

THE application to the body politic of what every biologist knows to be the responses of living organisms to alterations in environment is not a new idea, but Professor Cannon introduces novel features into the treatment The maintenance of the constancy of the internal environment, first outlined by Claude Bernard, and latterly considerably expanded and expounded by Cannon under the name of "homeostasis," may well be taken to heart by politicians Stability is more important than economy in the upkeep of the body, as in the preservation of the life of the state What corresponds in a nation to the internal environment of the body is the whole intricate system of production and distribution of merchandise Thorough cooperation of all functional groups is essential, and only by social stability can security, freedom and proper progress be reached It may be regretted that so few of our political leaders have acquaintance with biology, since it is ultimately with biological phenomena that they have to deal, and in the difficult times that yet lie ahead of us it would be well if some of the precepts outlined in this very readable little book could be borne in mind

THE LANCET

LONDON SATURDAY, JUNE 20, 1942

THE PLAN ON THE TABLE

The Medical Planning Commission established by British Medical Association has drafted an interim which is circulated this week by the *British* *Journal* as a basis for discussion by the bodies d on the commission and by the medical on generally The commission, established in , 1940, set out to study war-time developments their effects on the country's medical services, present and future Five subject committees met on 31 occasions and their reports have been by a sixth coordinating committee, which one composite document to the commission May 29 This document is now offered for com- and criticism before the commission completes interim report for submission to the Government

FIBROBLASTS

THE fibroblast does more for the integrity of the than all the advocacy of Field-Marshal and the late J S HALDANE, its function, in is to prevent the Organism-as-a-Whole from apart It performs this function so unobtru- that the surgeon is hardly aware of the fibroblast except as a potential nuisance There are almost no occasions on which fibroblasts have to be encouraged to grow, the problem is how to suppress them when their growth becomes unduly abundant does not take malignant growth into account speaking benign proliferations like are essentially fibroblastic, so are the ons that form on the surface of wounds that to heal by simple closure Fibroblasts normally a disperse tissue in the body—they are separated one another by cells of another type They however form secondary epithelia, as they do the so-called endothelial lining of the blood-vessels Fibroblasts in the body can be divided into topographical races Those derived from periosteum and bone, cardiac and skeletal muscle, from connective tissues in general, and from the dermal layer of the skin are physiologically distinct, since they behave in different ways on cultivation, and probably genetically distinct, since they tend to preserve their racial differences in a modified form even after prolonged cultivation The fibroblast itself can be regarded as the archetype of the mesenchyme cells of the body It is an elongated triangular or spindle-shaped cell which moves by pseudopodia, reproduces by simple mitotic division, and joins up with its neighbours by fine cytoplasmic processes It is not phagocytic Internally, the fibroblast can almost be described as a "typical cell," as the cytologist understands the term This is not surprising, since a fair proportion of what is known of the characteristics of cells in general is based on the study of fibroblasts

There is abundant evidence from tissue-culture that fibroblasts and epithelial tissues are antagonistic one another, and that epithelia do not spread so readily when fibroblasts are growing exuberantly as they do when fibroblast growth is artificially suppressed In healing by secondary intention, the fibroblast may easily become a nuisance, particularly when the fibroblast reaction is aggravated by long-standing infection It is probably wrong, however, to regard the epithelium of the skin as a delicate and fragile tissue As far as remaining alive under adverse conditions is concerned, it is probably the most resistant in the body Unfortunately, epithelialisation does not depend on the mere survival of epithelia but on their multiplication and above all their amœboid spread over the surface of the wound The spreading reaction is only too easy to impede, and swollen granulations probably offer a simple mechanical obstacle The problem of suppressing fibroblast growth and not that of epithelia has not yet been solved But it is possible that some now favoured wound dressings which are supposed to give good results because they are bland and inert actually favour the growth of epithelia at the expense of fibroblasts Most organic oils, for example, contain water-soluble surface-active matter (e g, fatty acids) as natural impurities, and surface-active substances are known to retard fibroblast growth in tissue culture at concentrations at which they are without appreciable effect on epithelia[1] The inhibitory substance in malt and grain described by HEATON[2] and MEDAWAR[3] belongs to a different category but exerts a much stronger effect of the same sort Tissue-culture experiments with the crude extracts so far used show that it can totally suppress fibroblast growth at concentrations at which it is either without effect on, or indirectly favours, the growth of epithelia It remains to be seen whether this property can be turned to good account clinically

Fibroblast reactions, or reactions for which fibroblasts are primarily responsible, are brought about by stimuli other than those grouped together under the heading of "irritation" It is well known that the internal pattern of bone almost exactly corresponds to the stresses and strains to which a particular bone is subjected Fibroblasts certainly orientate themselves under stress, even when the stress is in a system of ultramicroscopic organisation like clotted blood-plasma[4] It is possible, moreover, that the formation of collagen and other inert matter is stimulated by stress forces The stress-reaction of fibroblasts might almost be called the physiological foundation of bone surgery, but in the surgery of nerves it is coming to be regarded as a possible menace British surgeons regard end-to-end suture as the method of choice for repairing lesions of peripheral nerves Since a divided nerve leaves a gap by retracting under its own tension, and since this gap is increased when sufficient of the stumps has been resected to expose healthy nerve bundles at either end, it is the rule even for primary sutures to be made under tension Recent evidence[5] shows that collagenisation is directly or indirectly stimulated in nerves under severe tension, and that stretching a taut nerve which has been sutured in the position of flexion may cause an internal lesion which, in the most severe cases, is as serious as the one the operation was designed to remedy

---

[1] Katzenstein A and Knake, E *Z Krebsforsch* 1931 33 378

[2] *J Path Bact* 1926 29 293 1929 32 565

[3] *Quart J exp Physiol* 1937 27 147

[4] Weiss P *J exp Zool* 1934 68 393

[5] Highet W B and Holmes W Highet and Sanders F K. In the press

DYSPEPSIA IN SOLDIERS

At the time of the return of the original BEF from France a large number of men—old reservists and others—were found to be suffering from peptic ulcer, and the policy was adopted that all men having active peptic ulceration with positive radiological findings should be discharged from the Army Accordingly large numbers of men suffering from duodenal ulcer, for the most part cases with long-standing symptoms dating from before the war, were returned to civil life. Fresh ulceration arising during service seemed to be much less common, so that with careful medical examination on entry the number of soldiers with duodenal ulcer should by now have been much reduced, and the careful analysis set out by Morton Gill, Berridge and Arden Jones on another page bears this out The general view that proved active ulceration requires invaliding has been widely accepted, and in papers read at the Swiss Medical Society[1] this was again agreed, though one speaker suggested a temporary deferment from service for up to two years with reconsideration of the case during or at the end of this time

Besides this important group of cases of active ulceration, and the men with healed chronic ulcers, who must be treated and dealt with on their individual merits, there remain many dyspeptics in the Forces in whom no organic lesion can at first be clearly found Some of these undoubtedly have gastritis M Demole puts 40–50% of Swiss soldier dyspeptics in this group L Michaud, emphasising the frequency of gastritis, particularly stresses its occurrence after infections of the upper respiratory tract A Hammerli mentions focal and respiratory infection, but also reports that 14% of his gastritis cases had bad teeth, producing faulty mastication and hurried bolting of food In his carefully investigated series only 15% were diagnosed as "functional non-gastritis dyspepsia," in contrast to others who record figures as high as 65% The diagnosis between gastritis and dyspepsia still rests on the physician's personal views and is still too often left to the negative process of exclusion Morton Gill and his colleagues discuss again the criteria on which gastritis and duodenitis should be diagnosed They rightly lay stress on gastroscopy in the former and skilled radiology in the latter Duodenitis is at present largely a radiological diagnosis, but gastro-enterologists have long recognised the clinical picture of duodenal ulcer without X-ray evidence of ulcer as a nosological entity, not all, however, would agree that "no definite relationship exists between duodenitis and duodenal ulcer" Certainly the number of men who present the symptoms of duodenal ulcer without proof of ulcer is high, and though many are of the "anxiety" type they are clearly often suffering from a definite organic lesion In Morton Gill's cases the radiological diagnosis of duodenitis was made in 6%, though in different hands the frequency of this diagnosis varies considerably, as indeed does the X-ray demonstration of actual ulcer, and it is this personal variation which accounts for some of the wide differences in the figures from different sources In Service cases too differences are likely to arise according to the type of units under review—some admissions will include a high proportion from holding battalions, and these may be compared with younger fit men of more selected units Speaking of their gastritis cases, Morton Gill and his colleagues throw little light either on causation (which they term obscure), treatment, of which they are frankly pessimistic, or disposal, which they consider a problem likely to remain unsolved They only briefly mention nervous factors, yet in any series of dyspeptics these cannot be ignored, not only because of their primary importance and frequency but also because secondary gastritis and possibly other organic conditions may follow prolonged nervous dysfunction of the gastro-intestinal tract There is still much ignorance of, or reluctance to accept the existence of, psychosomatic disorders Too often dyspepsia is regarded as a manifestation of a local organic disease, when in fact it is but one expression of a personality disorder or a psychoneurosis The soldier who vomits his meals and cannot eat Army food, or who constantly complains of abdominal pains or flatulence, is often found on questioning to have in addition just that group of symptoms usually accepted as due to anxiety neurosis—exhaustion, dyspnœa, headache, sweating, and tightness or pain in the chest on exertion His dyspepsia is but the manifestation of a neurosis which in others may be expressed as rheumatism, effort syndrome or frequency of micturition In many cases such dyspepsia represents the breakdown of an asthenic constitution coming up against the environment of active Service life which is simply too much for it Some of these men are mentally dull or defective, but some have adapted themselves fairly well in civilian sheltered lives and fail under the strain of Army existence Most however have always been constitutionally neuropathic Many are incapable of grasping Army training, while others are of poor physique, their dyspepsia is as frankly provoked by exertion as is the dyspnœa of the "soldier's heart," so that "effort dyspepsia" might be as fair a designation as is the effort syndrome of Da Costa Fatigue, with the hurried eating of large meals in a state of exhaustion followed by an immediate resumption of physical exertion, plays a part in the causation of these cases

Treatment and disposal of this large group of dyspeptics—gastritis and psychosomatic, or often both combined—are difficult Demole rightly remarks that there is no generally applicable way of keeping these men serving The issue of a ration supplement in cash in lieu of food not eaten is open to great abuse, and the formation of "dyspeptic" companies or units has objections The idea of keeping these men in the Army, but stationed near and living in their own homes, is in practice almost unworkable In some cases transfer to suitable units is sufficient to avoid the strain producing the dyspepsia, in others a change of work may lessen fatigue and improve digestion As a rule, however, treatment is useless while the man remains in the environment producing his condition, and invaliding is unavoidable As Hammerli points out, the first essential in the treatment of any dyspeptic—organic or neurotic—is to obtain mental equilibrium With-it this diets or dentures will do little to correct an gastritis The days are past when functional ' and ' organic ' were regarded as te conditions never combined with each other no branch of medicine is a unified conception of on and structure more important than in ogy, and nowhere more so than in the where strain, fatigue and anxieties have their chance of influencing personality and health

---

[1] *Helv med Acta*, December 1941

LYMPHOCYTIC CHORIOMENINGITIS

THE clinical picture of acute aseptic meningitis, first l as a definite symptom complex by WALL-[1] in 1925, is distinct from the other diseases of u ætiology which produce a mononuclear reaction the cerebrospinal fluid The main feature is an ute onset of a febrile illness with symptoms of eningeal irritation The cerebrospinal fluid shows a mphocytic preponderance and is sterile on culture thirds of the cases are still of unknown ætiology , e other third are probably caused by one of three ruses so far isolated from these cases, known as the ruses of lymphocytic choriomeningitis,[2] of pseudo-mphocytic choriomeningitis[3] and of la maladie des orchers[4] The first of these has been isolated in the nited States, England, France and Japan from uman beings and mice, the second only from two ases in England, and the last in France, Switzerland nd Italy Though superficially similar there is one utstanding difference between cases of acute aseptic eningitis of unknown ætiology and those of lymphocytic choriomeningitis (LCM) Only 3 of 18 cases of nknown ætiology gave a history of a prodromal illness before the onset of meningitis, whereas in one roup of 23 proved virus cases,[5] 16 gave a history of an nfluenza-like precursory illness with malaise, generalised pains, headache, upper respiratory infection and ever which lasted one to three weeks before the onset f meningitis The most extensive and intensive studies of the virus of LCM have been made in the United States Since 1935, several thousand sera have been examined for antibodies against the virus[6] Of 1000 sera from persons who gave no history of any disease of the central nervous system about 10% possessed neutralising antibodies Of 106 people with a history of recent upper respiratory infection without meningeal irritation 28% showed neutralising antibodies, and of 58 diagnosed as aseptic meningitis 32% were positive Thus there appear to be several forms of the disease, a meningeal, an encephalomyelitic and a non meningeal Thirty-three proved cases of the meningeal form and three of the encephalomyelitic have been reported[7] In the non-meningeal form, of which only one proved[8] and one probable case[9] have been reported, the acute illness lasted about a week, followed by weakness and prostration with normal temperature for a week and then recovery

The incubation period as judged from experimental inoculation[10] of the virus into human beings is 1½–3 days to the beginning of the fever followed by the prodromal symptoms previously described which occur 5–10 days after exposure to the virus and last 7–20 days The virus is present in the blood from the 2nd or 3rd day till about the 10th day There is a definite leucopenia, with granulopenia and relative lymphocytosis and monocytosis at first In the meningitic form there is an acute onset of fever, headache and vomiting after 2–3 weeks The meningeal reaction of varying severity lasts 7–30 days, when it gradually recedes and is followed by recovery The white blood-count and differential count are usually normal The sedimentation-rate is normal or slightly reduced The virus may rarely be isolated from the blood during the first days of meningitis The cerebrospinal fluid is usually clear or slightly turbid and rarely shows a fibrin clot on standing The pressure is normal or increased The maximum cell-count has varied from 65 to 3200 per c mm in proved cases but is usually between 600 and 1000 during the early meningeal phase with about 95–100% lymphocytes The sugar and chloride content are usually normal, though the former may be reduced The protein content is usually slightly raised to 50–200 mg per 100 c cm but may remain normal The virus can be isolated from the fluid during the first 7–10 days of meningitis but is no longer detectable after that The cellular reaction usually decreases to 10–15 cells per c mm within 4–6 weeks of the onset of meningitis In most cases recovery is complete, but personality changes, prolonged fatigue, headache, impairment of memory, mental depression, dizziness and strabismus are occasional sequelæ A positive complement-fixation reaction with the blood appears 3–4 weeks after the onset and disappears in the course of 4–6 months On the other hand demonstrable neutralising antibodies, which have been shown to be distinct from those giving complement fixation, do not usually appear until 6 or 8 weeks after the onset and persist for 6 months to 5 years

The evidence so far collected indicates that the common grey mouse (*Mus musculus*) is the commonest reservoir of infection[11] The virus was demonstrated in the viscera of grey mice caught in the homes of 5 or 6 patients with lymphocytic choriomeningitis in two cities of the United States , 7 of these naturally infected mice were observed in the laboratory for five months,[12] during which time they showed no outward signs of infection although the virus was isolated from their blood and fæces several times Grey mice were trapped in 78 different homes in Washington D C , and in 35 of these homes infected mice were found , half the 123 mice examined were carriers of active virus Of 62 mice trapped in 22 homes where infected mice were found two-thirds were immune in contrast to 5 of 47 mice caught in homes where only non-infected mice had been found In Boston 4 cases of this disease have been observed among negroes in the past eight years All of these people were living within two city blocks of each other In a model study by FARMER and JANEWAY[13] of the most recent of these cases the virus was found not only in a mouse caught in the fourth floor apartment of the patient but also in the embryos of an infected grey mouse caught in the cellar of this building This patient had taken a mouse from a trap and handled the mouse exactly 20 days before the onset of meningitis Experimental work has shown that grey mice carry the virus in their fæces, urine and blood, and probably saliva and semen Thus there is an abundant source of virus in the excreta of animals to infect humans by direct contact, contamination of food, inhalation of contaminated dust or the bites of an insect vector There is also a possibility that the virus may be transmitted from dog to man The virus of lymphocytic choriomeningitis has been isolated from samples of dog spleen in America[13] and England[14]. An inoculated dog transmits the infection to his cage-mate, so if dogs in nature do become infected with the virus they can readily transmit it. Cats are not susceptible to the virus and the sera of a small number examined have failed to show any neutralising antibodies[14]. The virus does not appear to be transmitted from man to man. Although the precursory symptoms often include an upper respiratory infection there is little or no evidence of its spread in this manner. The only reported instance of isolation of the virus from nasal washings[15] occurred in the convalescent stage in a patient diagnosed as poliomyelitis, and since this patient never developed neutralising antibodies against LCM virus, there was no proof that this was the cause of her illness. All other attempts have been negative both in the natural infection in proved cases and in the disease produced by the injection of infected mouse brain into humans.

LCM may be mistaken for poliomyelitis, but the latter more often occurs in the late summer months and there is usually a rapid diminution in the number of cells as the disease progresses. There has been one striking example of how these two conditions may be confused[16]. In 1934 there was an institutional epidemic of a disease of the central nervous system considered to be atypical poliomyelitis in Los Angeles County, California. An examination several years later revealed that sera from 25 patients and 26 hospital staff in contact with them contained neutralising antibodies for LCM virus. This disease may be confused with tuberculous meningitis but here there is usually a reduction in the sugar content to below 45 mg. and of the chloride content to below 650 mg. per 100 c.cm. Few proven cases of the disease have been reported from this country but it is possible that a number of those diagnosed as influenza but who have failed to show either virus in their nasal washings or increase in antibody to any of the known influenza viruses may have been cases of LCM. In suspected cases of respiratory infection, undiagnosed pyrexias and meningitis, serum should be collected and stored in the ice-box so that if no other diagnosis is made this sample can be examined and compared with a later specimen for antibody against LCM.

1 Wallgren A *Acta Pediat* 1925, 4, 158 2 Armstrong, C and Lillie, R D *Publ Hlth Rep Wash* 1934, 49 1019 3 MacCallum, F O, Findlay, G M and Scott T F M *Brit J exp Path* 1939, 20, 260 4 Durand, P, Giroud, P Larrivé E and Mestrallet, A *C R Acad Sci Paris*, 1936, 203, 830 5 Baird, R D and Rivers, T M *Amer J publ Hlth*, 1938, 28, 47 6 Wooley J G, Armstrong, C and Onstott, R H *Publ Hlth Rep Wash* 1937 53, 1105 7 Armstrong C R *Harvey Lect* 1940–41, p 39 Farmer, T W and Janeway, C A *Medicine*, 1942 21 1 8 Armstrong, C and Hornibrook, J W *Publ Hlth Rep Wash* 1941, 56 907 9 Yamarat, C Thesis, Harvard School of Public Health 1940 10 Lepine, P., Mollaret P and Kreis, B *C R Acad Sci Paris*, 1937, 204, 1846 11 Armstrong, C, Wallace, J and Ross, L *Publ Hlth Rep Wash* 1940, 55, 1222 Traub, E *J exp Med* 1936, 63, 533 12 Haas, V H *Publ Hlth Rep Wash* 1941, 56, 285 13 Dalldorf, G *J exp Med* 1939, 70 19 14 Findlay, G M *J R Army med Cps*, 1940 75, 8 15 MacCallum, F O and Findlay, G M *Lancet*, 1936, i, 650 16 Wooley, J G, Stimpert, F D, Kessel, J F and Armstrong C *Publ Hlth Rep Wash* 1939, 54 938

IRISH COMMITTEE ON GASTRO-ENTERITIS.—The Minister for Local Government and Public Health in Eire has set up a committee to deal with the problem of gastro enteritis. The following have been appointed to the committee: Dr C. J. McSweeney, Dr W. P. O'Callaghan, Dr R. A. Q. O'Meara, Dr M. J. Russell, Prof. John McGrath, Dr F. N. Elcock, Prof. J. M. O'Connor, and Prof. W. J. E. Jessop.

Annotations

BIRTHDAY HONOURS

THE second supplement to the *London Gazette* of June 5 contains 65 closely printed folios of royal recognition of public work of many kinds. Medicine, as may be seen on a later page, is well represented in the list and there are few of its ever widening branches that have not gained public commendation. The life stories of those named would make an attractive preface to our forthcoming Students' Number. Equally noteworthy is the close association of many other names with the essential work of healing, whether in hospital or air raid shelter, or at the central executives. All of these recipients we hail in the name of the medical profession.

BUILDING WITH BONE

MR H. A. Brittain practises orthopædics in a Baedeker city, Norwich; his interest in the principles of architecture can therefore be understood. In calling his book "Architectural Principles in Arthrodesis"[1] he sounds formidable, but in fact insists on only four simple and essential points. First, the fixing material should be living bone graft placed with its long axis in compression rather than in tension. He illustrates this from the supporting Gothic arch, architecturally more secure than the flying buttress which breaks if roof or foundation are insecure. For arthrodesis of the hip the ischiofemoral graft, analogous to the Gothic arch, is architecturally preferable to the more commonly used iliofemoral graft, liable to fracture at either end if the head of the femur collapses through disease. Secondly, the breadth of the graft should be placed in the position of maximum stress; thus if the wrist-joint is to be fused—and flexion is here the main strain—the graft should be placed with the cancellous side looking towards the radial or ulnar aspect. Thirdly, in joints such as the knee or elbow subjected to a variety of strains two grafts should be used, crossing each other in an X; these act, he explains, in the same way as the cross bracing wires that hold the wings in the older type of biplane. Finally, the graft should be adequately protected; thus for ankle or finger fixation he buries the graft, which crosses from medulla to medulla of the apposing bone ends. Some of the credit must always go to the osteoblast—that "expert and unerring engineer," as Sir Arthur Keith has called it—rather than the architect. Where the strain is greatest the osteoblasts flourish. Not only is the Gothic-arch principle architecturally sound but the compression strain applied to the graft is also the best stimulus for osteoblast growth. Brittain gives only the results of the ischiofemoral graft operation for hip arthrodesis, for the development of which he deserves full credit. He does a subtrochanteric osteotomy and then inserts a massive bone graft between the osteotomy site and the ischium, below the acetabulum. The latter part of the operation presents difficulties, for the ischium is deeply placed and it is somewhat difficult to avoid the obturator foramen. Brittain has performed it on 35 cases with 1 death, from pulmonary embolism. He finds it specially useful for fixing the tuberculous hip, a procedure at which Professor Platt, in the foreword, nods his head sympathetically. The chief advantage claimed for this operation is that the subtrochanteric osteotomy also enables the hip-joint to adduct and the tuberculous cavity to collapse, thus falling into line with nature's method, essentially an adduction cure. He has performed the operation on 19 tuberculous hips; in 2 cases the graft was subsequently invaded by disease, 2 required further operation, and fusion was obtained in the remainder. For arthrodesis of the knee-joint his approach and dissection are no different, but the use of a twin bladed Galland saw parallel surfaces, and crossing bone grafts separation; flexion valgus or varus deformities the bone grafts from either side of the anterior of the same tibia The shoulder-joint he fuses suggested to him by G. K McKee, which the ischiofemoral graft By a posterior an arrow-shaped bone graft is inserted between and the axillary border of the scapula, the of the arm keeping it in compression, he gives of 3 cases where this appears to have been satisfactory, and further developments of the will be watched with interest He fuses the by a graft cut from the tibia and running in a from the lower end of the radius to the third bone He advocates this operation par- in the old ununited fractured scaphoid with and says that it is a far better operation than excision which leaves a weak painful wrist technique of the cutting and placing of the bone is beautifully illustrated by Mr Frank Kidd who the methods appear so simple that technical are apt to slip out of the mind Not all the can be regarded as routine procedures in the winds of time, but the book serves its in presenting well some carefully thought out procedures War brings problems of large gap joint fractures and disorganised joints, and it to have the principles of bone grafting joint fusion clearly laid down "No joint, no " is a reliable adage and many patients can be misery by early joint fixation

---

[1] 1. Edinburgh: E. and S. Livingstone. Pp. 132. 21s.

B$_1$ IN TRAUMA OF PERIPHERAL NERVES

is established beyond doubt that vitamin B$_1$- prevents proper nervous function Peters his colleagues[1] showed that in the absence of B$_1$ carbohydrate metabolism does not proceed the stage of pyruvic acid, and thus revealed a basis for the various degenerative and inflam- disturbances of the peripheral nervous system ed with such deficiency Even so, the beneficial claimed for vitamin B$_1$ on lesions of peripheral are still unexplained, as Mellanby[2] has pointed Clinical and experimental evidence that vitamin of value in peripheral neuropathy and neuritis is but observations on the influence of the on the post-traumatic regeneration of peri- nerves are scanty and inconclusive by comparison found that vitamin B$_1$ (1 mg by injection three a day) had a beneficial effect, particularly on motor es, in 4 cases of section of the median and nerves showing incomplete recovery after nerve suture Shosberg[4] reported good results with the vitamin in 83 cases of causalgic pain in amputation complete relief in 11 cases, considerable in 50 cases, medium improvement in 12 little improvement in 7 cases, the pain was- ged in only 3 cases It is difficult to draw any definite conclusions from these two clinical observations the details given are too few Experimental results are equally uncertain Gastaldi,[5] who studied effect of vitamin B$_1$ on post-traumatic regeneration otic pigeons, found no great divergence from usual course and type of regeneration of the axis Tangari[6] correlated recovery of function and findings during the course of regeneration sciatic nerve section and suture in rats, confirming s of others he found that complete paralysis per- in animals with vitamin-deficiency, and two thirds of this group showed trophic sores Animals on a normal diet, treated with subcutaneous 'Betaxan' injections (0 1 mg daily) showed acceleration of motor and sensory recovery He claimed that, histologically, the regenerated axons were more systematically arranged than those in untreated animals on the same diet The photographs demonstrating this, however, are not very convincing, despite the fact that he chose the best examples Recently Müsch and Rössel[7] studied the same subject in 80 guineapigs, in half the sciatic nerve was crushed just below the sacrosciatic foramen, whereas in the other half the nerve was cut at the same level but was not sutured These workers paid particular attention to the development of trophic sores after nerve interruption In most of the guineapigs with a crushed nerve vitamin B$_1$ (12.5 mg by injection daily) produced definite benefit In the untreated cases trophic sores developed as a rule in 4–8 days, whereas the treated animals either showed no sore formation at all or the sores were comparatively slight Motor function, as judged by the spreading reflex, recovered in 18–28 days in the treated cases, whereas in the untreated cases, owing to extensive necrotic changes, no definite opinion could be given about functional recovery In some of the untreated cases, however, the sores began to clear up spontaneously after 30 days There was no evidence that vitamin B$_1$ had a significant influence after division of the nerve, though in many of the treated cases sores were less extensive than in untreated cases On the whole the evidence does not justify the conclusion that vitamin B$_1$ is of significant benefit in traumatic lesions of peripheral nerves, particularly if a nerve has been severed

CHILD MORTALITY IN THE UNITED STATES

THE census of the United States taken in 1940 revealed for the first time in its recorded history a decrease in its child population In 1920 there were 33 6 million children under age 15, in 1930 36 1, in 1940 only 33 1 In 1920 they formed 32% of the population, in 1940 only 25%, and the trend of the birth-rate suggests a continuation of this fall The scale of that decline cannot long be compensated for by a reduction in the death-rate—as in this country, only increased fertility can effectively do that yet—the population aspect must be another incentive to the saving of child life What has been done and still remains to be done in the USA is shown clearly in a statistical analysis by Dublin and Spiegelman[8] Those who fear that the infant-mortality rate in this country (50–55 deaths per 1000 infants) may be approaching an irreducible minimum will be encouraged by the achievements of some of the states and cities of North America Rates of less than 35 per 1000 were recorded in 1939 in such cities as Chicago, San Francisco, Minneapolis and New York, while 37 per 1000 was reached during 1937–39 in the whole states of Connecticut, New Jersey, Oregon and Washington It is in the most recent years that the USA as a whole has forged ahead of us In 1920–22 the average rate in the two countries was equivalent, 80 per 1000, and in 1928–30 there was still no appreciable difference, with 65 in the USA and 66 in England and Wales, in 1936–38 the USA had fallen to 50 but England and Wales only to 57 America shows as yet no signs of a slackening in its rate of improvement There is, indeed, plenty of scope for further reductions with such rates as 109 per 1000 in New Mexico and the mortality of coloured infants still on a par with that of white babies twenty years ago The improvement of childhood mortality at ages over a year has been even more favourable than that in infancy At ages 1–14 it was 4 8 per 1000 in 1920 and only 1 9 in 1938—a reduction of 60% in less than twenty years (The corresponding rates in England and Wales were 4 3 in 1921 and 2 3 in 1938)

Peters R A *Lancet*, 1936, i, 1161
Mellanby E Third International Neurological Congress, Abstracts 1939 p 797
[illegible], A *Arch klin Chir* 1937 189, 61
M A Third Int Neurol Cong Abstr 1939, p 666
G *Ibid*, 1939 p 918
C *Arch Sci med* 1940, 69, 331

[7] Müsch H J and Rössel, W *Klin Wschr* 1941, 23, 599
[8] *Rec Amer Inst Actuar* 1941, 30, 28

To this record nearly all the main causes of death have contributed Particularly prominent is the trend from diphtheria, in 1920–24 the average annual death-rate of white children aged 1–14 was 45 per 100,000 while in 1935–38 it was but 8 The records of New York State are even more striking in 1920 there were 1904 deaths from diphtheria, or 18 1 per 100,000 persons of all ages, in 1940 there were 15, or 0 1 per 100,000 Deaths attributed to influenza and pneumonia have decreased rather spasmodically but a sharp fall at the end of the record suggests that the new methods of treatment are becoming effective Quoting the records of the children insured in the industrial department of the Metropolitan Life Insurance Company, Dublin and Spiegelman state that the death-rates from these causes have fallen by as much as half between 1937 and 1940 Other causes showing remarkable reductions at ages 1–14, seemingly due to the general rise in standards of living and improvements in medical care, are measles (a fall of 68% between 1920–24 and 1935–38), scarlet fever (58% reduction), whooping cough (63% reduction), diarrhœa and enteritis (64% reduction), and tuberculosis (67% reduction) On the other side of the picture very little improvement is shown by the death-rate from appendicitis and much less with accidents than with diseases Fatal motor-car accidents have however been declining since their peak in 1925–29 Generally favourable as this picture is the greatest possible measure of success has certainly not yet been reached As in England there remain wide differences between one part of the country and another and doubtless between one social class and another Public and private agencies for improving the health and well-being of the young have no reason yet to slacken their efforts

PLASTIC CONTACT LENSES

THE slow but steady evolution of the contact lens proceeds, but it would be rash to say that it is yet out of the experimental stage, despite the fact that large numbers of men and women are now wearing such lenses regularly and for long periods, and a considerable proportion have obtained better vision with them than any other method could give them The salient feature of the contact lens from the optical standpoint is that it eliminates the anterior surface of the cornea, such drawbacks as astigmatism and corneal irregularity —that exhibited by conical cornea in particular—no longer enter into the optical scheme, and visual acuity rises accordingly They have found their most striking use in cases of mustard-gas keratitis arising from the last war There they are doubly valuable, for not only do they eliminate the optical disadvantage of corneal irregularity but they give most comforting protection to the hypersensitive cornea The physiological as well as the pathological eye, however, demands for comfortable wear the same condition of the contact lens—perfect fit Working the optical surface is simple compared with the degree of accuracy required in the scleral fit It is therefore natural that those manufacturing and fitting contact lenses have considered the possibilities of a plastic material Much research and inquiry have been and are being expended on this aspect of the subject, both here and in America Some very enthusiastic reports have appeared in America on the results obtained with plastics, notably ‘Obrig,’ but in this country much further work is needed before they become a practical proposition Glass is an ideal substance for more or less permanent contact with a mucous membrane, presumably because of the high degree of polish that can be applied to it, but we have not yet discovered a plastic material which compares with glass in this respect, nor one which is uninfluenced by the tears This is not to say that such a material will not be forthcoming in time We may see the day when, given the expensive machine, turning out the actual lens in plastic material will become inexpensive and easy Thus in the future a patient may be provided with a permanent machine, and a bottle of fluid or a sheet of plastic material, with which apparatus he will make his own lenses as occasion demands, in much the same way as he now changes the blade in his safety razor The use of plastic lenses in general has hitherto been prevented by their liability to scratch and their inability to take and retain a high polish—both expressions of the same quality If plastic material could be made considerably harder it would also acquire an additional rigidity, lack of which is possibly the reason why plastic contact lenses are less well tolerated than glass

ANÆMIA IN NEPHRITIS

A NEPHRITIC patient usually looks pale and interesting but as a rule too little interest is taken in his anæmia MacArthur's[1] recent investigation of the subject deserves attention because of the careful technique employed, and because of his consideration of th effects of different phases of renal disease on the blood picture His work was confined to children, of whom 2 had acute hæmorrhagic nephritis, 5 the nephrotic syndrome, 5 nephrosclerosis, and 5 chronic hæmorrhagi nephritis In acute hæmorrhagic nephritis he found slight orthochromic normocytic anæmia, with sligh leucocytosis, early in the course of the disease Immediately after clinical œdema had disappeared, whe diuresis had set in, there was a rise in the red cell count presumably due to concentration of the blood, in convalescence, when there was neither œdema nor diuresis the red count had returned to its early level and leucocytosis had disappeared Contrariwise, in the nephroti syndrome the blood became more concentrated whe œdema was increasing, and was diluted in the phase o diminishing œdema Hæmoconcentration thus appear to be due to the removal of fluid from the blood by th kidneys in acute nephritis, while in nephrosis th corresponding flow is from the circulation to the tissu spaces MacArthur found no evidence that nephrosi itself caused anæmia, but it developed rapidly at th onset of acute pyogenic complications. Reticulocyt counts showed that in these acute anæmias the bone marrow was not aplastic Several observers have found a close relation between nitrogen retention and anæmia This was not so in MacArthur's cases of nephrosclerosi with azotæmia and very high blood-pressure, unles hæmorrhage occurred However, the patients with chronic hæmorrhagic nephritis (i e, a sequel to acut nephritis, with hæmaturia, cylindruria, albuminuria variable œdema, moderate azotæmia and hyperpiesia all had “the characteristic anæmia of nephritis,” out o proportion to the amount of blood lost The cause o this anæmia is obscure, it is moderately severe and th corpuscles are orthochromic and normocytic or megalocytic, there is slight leucocytosis and the reticulocyte are not reduced The marrow is thus not aplastic, bu treatment with iron or liver is unsuccessful Treatmen of anæmia in nephritis is generally disappointing Furthermore, the effect of a hæmatinic is difficult to assess, for (as MacArthur's paper clearly shows) changes in the blood-count caused by hæmoconcentration and dilution, hæmorrhage, and infection must also be considered If the encouraging report of Williams, Longcope and Janeway[2] leads to the widespread use of sulphanilamide in the treatment of nephritis the picture may well be yet more confusing

---

[1] MacArthur, P *Arch Dis Childh* 1942, 17, 1

[2] Williams, R H, Longcope, W T and Janeway, C A *Amer J med Sci* 1942, 203, 157

THE BP has been amended so as to omit the quinine from Easton's syrup, which becomes syrupus ferri phosphatis cum strychnina

In England Now

A Running Commentary by Peripatetic Correspondents

How much "civilisation" you must be prepared to while fighting ostensibly to preserve it is a moot There are those who say that the arts for are more permanent—and therefore more —than any damn war and must be kept going all costs At the other end of the scale are those totalitarians who maintain that everything that not materially contribute to winning the war should by the board These would close down all schools, all recreations—except those intended to benefit or munition-workers—and euthanise (with no emphasis on the first syllable) all who are too or, for some other reason, incapable of furthering the effort

The rival claims of the Services and of the civil popula- on the doctor-power of the country have now reached acute stage The Services insist on the establish- requirements of medical officers and it is obvious all units going abroad must be self-contained, com- in themselves, and capable of being detached from units without loss of essential skilled personnel gh a battalion MO may have too little to do at he may have too much to do when his unit is in There is no getting round this difficulty, his a whole-time job But in the case of home-based the situation is different Small detachments— or salvage units, for instance—can quite well and in many cases are being, doctored by local practi- Could not some of the medical work at military centres or in certain types of military hospital done in the same way? More part-time medical ary service, on the lines of ARP medical service, lead to a more economical use of doctor-power prevent the civil population being unduly deprived of medical attention

* * *

The complete *Caduceus* staff is now free, so that we begin publication again as soon as the Japanese are dealt with Lee and I escaped from the prison camp are in China along with all the rest of the gang— what a gang we are I have a bit of a scheme here, will take three months to finish, but then I hope do my best to get away via England and join Mac- thur If I can work it what a time we shall have I t had a beer or sherry since Christmas Day, when a shell blew the glass out of my hand and the rest of bottle over me The Navy and Canadians are in Point Camp, all the rest of the regulars and eers are in what is left of Sham Shui Po, and the are in Gun Club Hill and Argyle Street camp the civilians are interned in the warders' quarters Stanley The Irish are third nationals and free Queen Mary Hospital was not hit and is now a Nip hospital. The university was not damaged but every- was looted by the Nips I saw them smash open every locker and drawer and remove all microscopes and apparatus All my records are gone, I saw one little pull out all my sedimentation photo records and throw them away My house was blown to hell, with all my books and other possessions except a bed-pan which I saved and lost later I was nearly caught by the Nips coming through their lines here in China and had to run for it and lost my pack All I now possess in the world is one pair of slacks, tunic, shirt and pyjamas, all of which I was wearing because of the cold All my treasured papers were in the pack Poor old Black was shot along with three VADs at Stanley, he had been sent to run a hospital in the college there because we thought it would be a quiet spot, but the fighting at the end was fierce there and wherever fierce fighting occurred the Nips murdered everyone I should like to get my hands on the necks of some of those people in Hong-Kong

* * *

Your peripatetic correspondent of April 25 who said there were no birds in Reykjavik ought to have made it clear that he was referring to the winter and to the ground, and excluding the gulls, ravens, golden plover, snipe, geese and ducks flying over the town and the multitude of pigeons living in their gigantic doll's houses For a month or so now the Icelandic redwings have been back in the gardens round the houses singing sweetly and chasing one another round the buildings, and on May 11 the arctic terns arrived for another breeding-season on a tiny islet in the lake in the middle of Reykjavik They can't read the date but they arrive each year almost dead on May 12, although they may reach other Icelandic haunts much earlier The troops call them "dive-bombers," because they dive into the water from twenty feet or so for their prey and swoop down and scream at intruders

I don't know whether the salt cod you are getting is the same as the dried cod which we see here hung up on posts and lines in the gardens like clothes put out to dry I was encouraged to try a bit of this myself the other day, it felt and tasted like a splinter of wood which had been rubbed on fish The real way to eat it I was told, is to cover it with a good lump of butter when it is said to be delicious But the Icelandic butter is delicious in itself, and I would prefer it without splinters

I was lucky enough to get a day in the country a week or so ago Four of us went by bus to a ski-club's rest-hut in the mountains We lunched on excellent coffee and cakes, played with the local 'hot spring," stuffing up some of the vents to get a greater output of superheated steam from another and so on like a lot of mudlarks This spring's steam is piped to the radiators of the rest-hut, and within a few yards of it is an ice-cold rivulet from higher up the mountain We could have boiled eggs there but it was less trouble to get them at the rest-hut on our return Next we rambled over the moors, treading alternately on a rich greenery-yallery carpet of moss about five inches thick, making walking as difficult as trudging through soft sand but nice and soft for the feet, and no shoe-cutting bare lava blocks, heaps of volcanic clinker and stretches of volcanic ash We disturbed a few meadow-pipits, Greenland wheatears, northern golden plover and Icelandic ptarmigan on our way up to the top of an old volcano, some 1600 feet above sea-level The very top was a bog round the edge of an enormous circular crater with precipitous sides and a pond in the choked bottom

On a second outing I visited Thingvellir, the plain to which rode the men from all parts of Iceland each year for the annual parliament about a thousand years ago We approached it over rolling deserted moors, until, when we topped the last rise, a huge lake appeared, its absolutely still surface reflecting every little hill and big snow-capped mountain on its further side, like every good lake it had a romantic island in the middle The road next entered a ravine with perpendicular walls of craggy contorted lava A little way along came a break in one wall through which poured a little river A bridge over it carried the road out of the ravine Here we left the car and clambered over the lava to the top of the wall and looked down into the grass-covered ravine with its little river A little further on we climbed down into the ravine at the foot of a magnificent waterfall There are two more ravines not far away, but these cannot be entered, they are full of deep still water Their scenery is grand · lava blocks covered in places with cushions of grey moss and lichen The sun glints into deep pools and shows up the rocks at the bottom A couple of white wagtails were flitting and chirping in the ravine redwings sang outside, and we had the extraordinary luck of seeing and hearing a cock Icelandic wren, whose native name means "brother of the mouse"—a rare bird The road crosses the end of one of these ravines by a small bridge next to a deep pool into which it is customary to throw nickel coins for luck The water was so clear that we could see the bottom littered with coins—and with one or two wire contraptions used by the local lads to recover the cash surreptitiously

Don't think I spend my time like this, these are the only two outings I have had since I set foot in Iceland nine months ago

* * *

The other day a friend and I were strolling past the Ministry of Information after an austerity lunch when we saw a man walking along with one foot back to front He was walking with some difficulty, but with the lack of self-consciousness that betrays the old hand, and his companion also seemed to take it as a matter of course

His knee bent forwards in the usual way, and the toe of the reversed boot was slightly turned up I maintained that the poor fellow had broken his leg and been treated by a surgeon who had had a pre-austerity lunch But my wife brightly suggested that he had an artificial leg with a ball-and-socket joint at the knee which had swivelled round, and that he was too shy to adjust it in the street Against this we urged the man's obvious unconcern—this was no acute condition—and surely he could have stepped into a doorway and twisted it back again Perhaps another peripatetic can resolve the mystery

* * *

The soft-fruit picker and probably the hop-picker are in for a strenuous time this year, lots of work and few to do it, but another class of seasonal worker, the old gentleman who gives away the prizes, should have a comparatively easy time, for not only will prizes be fewer but his theme is already mapped out for him—war and the gods of war, peace and the bright new world " in which you . " This set form of discourse is like the very old times when empire-builder or successful business man held forth, when cardinal virtues, especially industriousness, were extolled, one humorous but decorous anecdote expected, a peroration semi-obligatory, and no time limit Later the whole profession was ruined by letting in people like Barrie, who whispered—only the front row heard him—a literary masterpiece, which later they made into a book, called " Courage " Then all the old gentlemen, most of whom had long ceased to think at all—were in fact like dormice in winter, living on the accumulated pads of experience, the fat globules of stories, the butyric acid of set phrase—had to wake and try to be original and humorous and poignant, and it degenerated into a sort of competition, who could be the most unorthodox, so that some of them blundered into unedifying truths " Hard work is like drink a habit, and he who acquires it will probably be successfully parasitic on his fellows," " You are the cars of a genetic make, running on the petrol of diet over the roads of environment, mere automata," " Man's most terrible sin, and the one for which he is being and will be most terribly punished, is Industrialism " That sort of thing At these prize-givings, although the adults always clap politely, inwardly they jeer at these men, sometimes because they are assuming parental function without procreation, often because they are relying on very distant achievement when in reality they were quite different people, hardly a molecule unless it is some old calcium die-hard remains of the general who won the battle of Blank, or of the pushing young business man who founded the Mammon Stores, but the real reason is we feel we could do it so much better ourselves I do myself I should love to give the young a few tips—tell them, for instance, that if they gaze at a person or scene with a view to remembrance, spend a huge five minutes on it, say to themselves, " Have I got every line and shade now ? ," go back to it time and again, always with a view to remembering, for that is of the essence, then not only have they a stereoscopic picture for life, but when they recall it they will remember also smells and sounds and how they themselves felt when they recorded it And if it were a city school at which I was giving the prizes, and if there were any country boys or girls there, I should like to tell them how I sympathised with them and how if they longed, as I did, to hoard little gems of the country they could do it by utilising that strange power of words to fix and isolate scenes and sounds and smells which have been recorded for them by their senses, only they must be your own words and you must be very sparse with them Then when you are home-sick among the chimney-pots, you can pull out your diaries and really see and hear and smell and gloat, phrases like but it's no use unless you make your own Mine come back alive only to me—" greenfinches on the copper beech," " the confidential whispering of the longtail tits," " orange-tip on Lady's Smock " Last week I got a vividly lovely one " green hair-streak on bugle " But people who go in for such trivialities don't get asked to give away prizes, although they have them

Dr V P Sydenstricker, professor of medicine in the University of Georgia, is to carry out an investigation into the nutrition of London school children

BIRTHDAY HONOURS

The honours list issued on June 11 contains the following names of members of the medical profession —

O M

Edgar Douglas Adrian, MD Camb , FRCP, FRS
Professor of physiology in the University of Cambridge

K C B

Surg Vice Admiral Sheldon F Dudley, CB, MD Lond , FRS
Medical director general of the Navy

K C V O

Sir Alfred Webb Johnson, CBE, DSO, MB Manc
President of the Royal College of Surgeons of England

KNIGHTS BACHELOR

Prof Wm Fletcher Shaw, MD Manc , FRCP
President Royal College of Obstetricians and Gynæcologists
Maj General John Taylor, CIE, DSO, MD Glasg , IMS
Director of the Central Research Institute, Kasauli

C B (MILITARY)

Maj General Archibald C Munro, MD Glasg , IMS

C M G

Donald B Blacklock, MD Edin , DTM
Professor of tropical hygiene, Liverpool University
Victor W T McGusty, OBE, MB Dubl , DTM
DMS Fiji, central medical authority in Western Pacific
Alexander F Mahaffy, MD Toronto, DPH
Director Rockefeller yellow fever research institute, Uganda

C I E

Lieut Colonel George R McRobert MD Aberd , FRCP
Professor of medicine and supt of the general hospital, Madras
Prof Lionel E Napier, FRCP
Director of the school of tropical medicine, Calcutta

C V O

Cedric S Lane Roberts, MS Lond , FRCS
Gynæcological surgeon, Royal Northern Hospital

C B E (MILITARY)

Surg Captain Henry StC Colson, MB Lond , RN
Air Commodore Andrew Grant, MB Edin , DOMS, RAF
Colonel Alan R Laurie, MB Edin , DMRE, late RAMC
Radiologist, Royal Infirmary, Derby

C B E (CIVIL)

Edward A Carmichael, MB Edin , FRCP
Director neurological research unit, Queen Square
Thomas J Mackie, MD Glasg FRSE
Professor of bacteriology, Univ Edinburgh—for civil defence
Prof Alfred C Norman, MD Edin
Director of the X ray Institute in Iraq
Wyndham Parker, MC, MB Edin
MOH of Worcestershire—for civil defence
Lieut Colonel James B Simpson, MD Edin , FRCPE, DL
For public services in Sutherlandshire
Frank D Turner, MB Lond
Med supt Royal Eastern Counties institution

O B E (MILITARY)

Surg Commander Robert C May, MC, MRCS, RN
Temp Colonel Thos Frank Arnott, MB Glasg , RAMC
Acting Brigadier Robt A Hepple, MC, MB Edin , late RAMC

O B E (CIVIL)

Harold Balme, MD Durh , FRCS
Med supt Pinder Fields emergency hospital, Wakefield.
Leonard C Blackstone MB Lond
Surgeon, Merchant Navy
Henry O'D Burke Gaffney, MD Dubl
Senior pathologist, Tanganyika
Alexander Cruickshank, MD Aberd
Senior medical inspector, Equatorial Province, Sudan
William Santon Gilmour, MB Lpool
First aid commandant, Leeds casualty service
Ernest K Macdonald, MD Lond , DPH
MOH of Leicester—for civil defence
Andrew P Martin, MB Glasg , DTM
DMS for Defence and Air Force, Southern Rhodesia
Frederic G Rose, MD Camb , DMRE
Med supt leprosy hospital, British Guiana
Philip J Watkin, MC, MRCS
Med supt Lambeth (LCC) Hospital—for civil defence
Charles F White, MD Manc , DPH
MOH of City of London—for civil defence

M B E (MILITARY)

Temp Lieut Colonel Geo K Fulton, MB Glasg , RAMC
Captain John N Heales, MB Brist , RAMC
Captain Jessie A T Henry, MB Edin , EAfrAMC
Temp Surg Lieutenant Simon Meleck, MB Lond , RNVR

M.B E (CIVIL)

(Miss) Mary Andrews, MRCS
Chief civil defence warden, Chapel en le Frith
Lieutenant James E Howard, MRCS, DPH
Assistant port health officer, Karachi

ss) **Jerusha Jhirad**, MD Lond , MRCOG
MO in charge Cama and Albless Hospitals, Bombay
a Bahadur S H **Pandit**, MS Bombay, DO
MO in charge ophth dept King Edw Hosp , Indore
M **Stuart Stanbury**, MD Toronto
Regional blood transfusion officer EMS

AIR FORCE CROSS

oup-Captain **Philip C Livingston**, OBE, FRCSE DOMS, RAF

KAISAR-I-HIND MEDAL

ristian F **Frimodt Moller**, CBE, MD
Med. commnr Tuberculosis Assoc of India (bar to gold medal)
ss) **Isabella M. Roberts**, MD Toronto
MO in charge Amer Hosp for wom and childr , Madras
ulya C **Ukil** MB Calcutta
Sen phys , chest dept , Med Coll Hospitals, Calcutta

MENTIONED IN DESPATCHES

r Commander **Claude Keating**, LRCPI, RN
ing Surg Commander G T S **Parker**, MRCS, RNVR
l Surg Lieutenant **Ronald Stewart**, MB Edin , RNVR
-Commodore T J **Kelly**, MC , MD Dubl , RAF
oup Captain V R **Smith**, MRCS , RAF
oup Captain H W **Corner**, AFC, MD Aberd , RAF
ing Grp -Capt C J S **O'Malley**, MB Lond , RAF
ing Commander G W **McAleer**, MB NUI RAF
ing Commander J C **Neely**, BM Oxfd, DOMS, RAF
ing Commander P B L **Potter**, MD, DPH, RAF
uad Leader F G **Mogg**, MRCS, AAF
uad Leader V T **Powell**, FRCSE, RAF
uad Leader C E G **Wickham**, MB Lond , RAF
ing Sqd Leader W **Simpson**, MB, RAF

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS M P

The announcement of the Anglo-Soviet treaty in he House by Mr **Eden** was given a very cordial recepon and opens up a new chapter of international lations in Europe Mr **Lloyd George** made one his rare contributions to debate by emphasising the alue of the treaty and by saying that if it had been egociated some years ago the present world-war would ot have occurred The fact that the treaty has now een negociated will certainly make the immediate construction work after the war or during the period armistice very much easier to carry out Much of is work will have to do with food relief and with dical relief work, and it ought to be in the hands of medical director Plans are already being made and ven stocks of food and materials earmarked But we ave not reached the second-front milestone yet and the mistice milestone comes after that

The announcement of the treaty was made after the onclusion of the Coal debate when Parliament adopted the white paper It was stated in the debate that an effort as to be made to secure a reduction of consumption by voluntary rationing, but it was equally clear that if this effort failed—and no-one seemed to be sure it would succeed—then the Beveridge plan which (with me modifications) is included in the white paper would be put into operation All the preliminary work in connexion with fuel rationing is to be carried out once in any event This may be only good insurance but it looks like disbelief in voluntary methods It can be taken I think, that fuel rationing will be in tence during next winter and on the points system

During the speech in which he wound up the debate **Stafford Cripps** said the Government were "in olute earnest" about every part of the scheme, and r considering man-power he next dealt with the ation of a medical service for the mines "We sire," he said, "to set up a medical system in the dustry which will give full play to the powers of dical rehabilitation, so that the wastage can be pt down not by harshly returning men to the dustry when they are not fit, but by preventing them aving the industry for good, when a small amount of medial treatment might enable them to retain their ation in it " If this is to be done properly then (if I may repeat myself for emphasis) a medical director ould be one of the chief controllers of the board And as the medical profession is not indefinitely expansible, careful selection of staff will have to be made Stafford hoped that the medical service in the mines might be an example to other industries There have been movements in that direction already, and Soviet Russia which has developed close collaboration between medical and technical directing services in industry, will have lessons for us to learn

Next week before these words appear, there is to be a debate on Education in which health questions as affecting evacuated children will come up for review As also questions affecting the age-groups 14–16 and 16–18—their work, their volunteer service work and their opportunities for education There is also to be debated the question of an improvement in old-age pensions At an early date the subject of family allowances, already raised in the Lords, is to be discussed in the Commons But much will depend in the next twelve months on the success of the coal proposals not only for war production but for our health and our well-being generally

FROM THE PRESS GALLERY

Family Allowances

On June 10 the Upper House considered family allowances for the fourth time in recent years and their deliberations are having effect for, as Lord **Southwood** pointed out in his opening speech, public opinion which has an unerring instinct in matters of this kind is daily mounting in its favour and there is even an awakening of interest on the part of the Government The white paper showed that to give every child under 15 a weekly allowance would cost £132 millions a year, but Lord Southwood doubted whether we could afford not to afford it The principle has already been admitted in allowances to the dependants of Service men and in rebates on income tax It was a tragic anomaly that at present it was the very poorest who did not pay tax who were excluded from direct financial relief Lord **Samuel** however, affirmed that to refrain from taking was not the same as giving and that a rebate could not be regarded as a grant while Lord **Simon** suggested that it was better to get off altogether than to get off a little But the Archbishop of **Canterbury** went to the heart of the matter in his maiden speech when he contended that if a relief was offered to the well-to-do section of the community we should take care that its benefits were also extended to the poor Child endowment would give relief to the worst types of poverty and recognition to the real heroine of present-day civilisation —the working-class mother He felt that the case for family allowances did not only rest on an appeal to our sympathy It was also an appeal to justice But Lord **Simon** in his reply said that until the Beveridge Committee reports the Government is unwilling to do more than listen to all comers

Medical Services for Miners

Last week **Medicus** described the Government's scheme for a medical consultative service for the mines and in debate in the House on the white paper on coal policy it was clear that this part of the Government's proposals at any rate had earned the enthusiastic approval of all parties Mr **Gordon Macdonald**, himself an ex-miner who wound up on the second day (June 11) said most miners were strong hefty, healthy men, but in their trade they faced great difficulties and are subject to many ravages, particularly silicosis Mr Macdonald stressed the need for the reference in the white paper to rehabilitation to be taken in dead earnest Surely he added, it was not a mere form of words, but a sign of a sincere and genuine intention to deal with this serious problem Sir **John Anderson** in his opening speech on the first day said that death accident, industrial disease and superannuation were a steady drain on the man-power of the mines, and and there was a further wastage of 25,000 men a year who were going out of the industry on medical certificates That wastage he affirmed, must be compensated, and Mr J, **Maxton**, in his out of hand condemnation of the Government scheme, though approving the idea of developing a special health service for miners, admitted he was suspicious of some of the reasons for which it was being done It was said that it should be possible to reduce the numbers of miners leaving the industry with medical certificates on account of sickness of a not very serious character, and he feared that the medical officers would be additional disciplinary agents to drive miners back into the pits when their panel doctor, who firmly and with unanimity for the establishment of these two fundamental principles it may yet be possible to undo some of the harm which has been wrought by the ill-considered manner in which the order has been applied

J JOHNSTONE JERVIS,
Medical Officer of Health
Leeds

SEVERE GASTRIC HÆMORRHAGE

SIR,—We owe so many advances in our knowledge of the anæmias to the work of Professor Meulengracht that I regret the necessity of criticising his views on the diet of gastric and duodenal ulcer Though feeding immediately after a slight hæmorrhage can do no harm and was common practice in many English clinics since Sir Edmund Spriggs introduced the Lenhartz diet to this country some 35 years ago, I profoundly disagree with Professor Pickering's advocacy of the Meulengracht diet for severe gastric hæmorrhage The mortality of Meulengracht's own cases (*Lancet*, 1935, ii, 1220) was lower than that in a neighbouring clinic because the starvation in the latter was of fluids as well as of solids, whereas the necessity of supplying sufficient fluid has long been widely, though perhaps not universally, recognised in England The low mortality compared with that in most English hospitals was due to the very large proportion of mild cases of illness admitted into Danish hospitals Death following hæmatemesis is never the result of starvation, it is the result of loss of blood plasma or of red corpuscles or of both When the gaping hole in a sclerotic artery at the base of a chronic ulcer from which fatal hæmorrhage has occurred is examined, it becomes difficult to understand how anybody could believe that a diet which includes a dinner of boiled chops, vegetable gratin and stewed apricots, and a meal at 6 P M of "bread and butter, sliced meats, cheese and tea," as recommended by Meulengracht, could do anything but hasten death It is true, as Professor Pickering points out, that hunger contractions occur in the empty stomach, but they are shallow and intermittent instead of deep and continuous like the peristaltic waves of the full stomach

The old-fashioned treatment by complete rest, morphia, and a short period of starvation with an adequate supply of fluid by rectum gave admirable results with a total mortality, as Ryle and I showed in 1937 (*Ibid*, i, 1), of about 1 5% The modern technique of transfusion has made it possible to save the majority of the few lives which would otherwise be lost, especially in those hospitals in which the indications are accurately assessed by blood-volume estimations, as Dr Izod Bennett and his colleagues (*Ibid*, 1938, ii, 651, 1942, i, 551) and Dr G D Hadley (M D Thesis, Camb Univ 1939) have shown Such estimations also make it less difficult to recognise the very small number of cases in which surgery after preliminary transfusion can alone save the patient

ARTHUR HURST
Oxford

THE BUNYAN-STANNARD ENVELOPE

SIR,—In your leading article of April 25 on progress in burn therapy it is made to appear that in the Bunyan-Stannard technique preliminary cleansing is dispensed with, and the method is criticised on this account In all publications on the envelope method, emphasis has always been laid on its first principle—thorough initial cleansing of the part by washing with a predetermined concentration of electrolytic sodium hypochlorite, together with the removal of any obviously dead tissue where the condition of the patient permits Besides cleansing the lesion, this results in a rapid reduction of œdema by the internal drainage of the inflamed zone about the burn, together with an improvement in the blood-supply It is true that the envelope is successfully employed as a first-aid dressing without a preliminary washing where this is not possible, but provision is made for the immediate irrigation of the burn as soon as it is expedient to do so You mention the possibility of danger in the too early removal of sloughs This may be true if other methods of treatment are to be employed subsequently, where the almost inevitable secondary infection may outweigh the damage from the absorption of the toxic products of putrefaction in retained necrotic tissue In my method, however, the sloughs may be allowed to liquefy without putrefaction and the breakdown products removed as they form, or the sloughs may be excised under a stream of hypochlorite In either case the use of the envelope will minimise the risk of secondary infection, which, with the possibility of early resumption of full function, should fully meet the requirements for minimum scar formation mentioned in your leading article

The experience of many surgeons in the past year has shown that the envelope method gives uniformly satisfactory results in the treatment of all types of burns and wounds of the extremities This is particularly so where other methods have proved unsuitable as in combined burn and fracture In order to obtain the results so ably demonstrated by my surgical colleagues who have collaborated with me in its evolution, it is necessary to follow the theoretical case for its employment, to understand the action of and indication for the different concentrations of the solutions used, and most of all to follow the directions

JOHN BUNYAN

LUBRICANT OR IRRITANT?

SIR,—During many years of research on the carcinogenic and dermatitic activity of mineral oils I have performed many experiments on mice with liquid paraffin and have never succeeded in producing a single tumour either internally or externally After frequent applications of liquid paraffin to the skin the only pathological condition I have commonly met with, and apparently due to the liquid paraffin, is fatty infiltration of the liver This condition at times may be so advanced as possibly to affect seriously normal liver functions It may be produced with any mineral oil and we did not find that it was related to the activity of the oil to produce cancer In fact our experiments showed rather the reverse, for mice treated with some oil-fractions in which the carcinogenic material was concentrated by means of methyl sulphite tended to show the condition less frequently than their less active residues The middle boiling range of mineral oils appears to be the most active in producing the condition, and the refined lubricating oils more than the crude oils. It was rarely produced by the so called spirits or heavy residues

Mossley, near Manchester
J M TWORT

WHOLE MAN

SIR,—I was pleased to see your corrective annotation of May 23 on Dr Hulbert's article Organic Diseases presenting as Psychological Disturbances There seems to me little doubt that the danger of overlooking organic disease in treating cases by psychological methods has been, and still is, grossly exaggerated in some quarters and acts as a deterrent to early and adequate psychotherapy Dr Hulbert produces but seven examples over a period of 3 years by contrast with Cook and Sargant's fifty cases of neurosis diagnosed as organic disease in a "consecutive series of positive cases seen over a period of 12 weeks" and after elaborate investigation in hospital Apart from cases 2 and 7, which show the classical difficulties in diagnosis of GPI and disseminated sclerosis, the cases described by Dr Hulbert are not very convincing The fact that the other five patients are all over 50 would make them very much suspect from the point of view of psychotherapy, quite apart from anything else

But, as your *annotation rightly points out*, the question in treating a patient is not functional versus organic, for the two are not mutually exclusive As you say, " our conception of organic and functional illness has changed We are beginning to notice that even an organic illness attacks not a system but a man " Some study and treatment of man as a whole—i e, man in his psychological aspects—is *essential if one* is to maintain a proper balance It is here that medical teaching fails us The artificial distinction between *organic or* real diseases, and functional or unreal—vaguely imaginary or at any rate uninteresting—ones, is still far too prevalent in our medical schools and teaching hospitals The result is that where no organic lesion has been found the case is diagnosed "neurotic" *by elimination* a very dangerous method of procedure as well as one which leaves much to be desired in the investigation and treatment of the patient's illness A better study of modern psychological methods would that there are *positive* methods of diagnosing as well as methods of further classifying and such conditions In fact in my own practice occasionally referred patients back for a physical on account of the lack of evidence to a positive diagnosis of neurosis And further, by psychological methods does not exclude by physical remedies or vice versa For one can, and does, give sedatives to patients analysis, just as one can, and should, give reassurance to a patient undergoing a serious Or again with nervous children, play therapy be an adjuvant to glucose and bromides (or one put it the other way round) Certainly the two not antagonistic or mutually exclusive, though one at times have to decide which can be pursued with profit

would join with your plea for the study and treat- of the whole man But let it be the whole man, his psychological aspects, and not that con- of "systems" which passes for one in our oks and so much of our medical teaching

H EDELSTON

—Dr Hulbert cites 7 cases as a corrective against present tendency towards a psychological approach "—as if to approach disease from this direction the risk of making a gross error of diagnosis this is not the case If a psychiatric training anything it teaches that an individual must be *in toto* and in relation to his external and (physical) environment, only then can his state be evaluated Every person whether or symptom-free, possesses a mental state, pathological mental states are first subdivided into " and "functional" according to whether or the psychiatric deviation from what is arbitrarily as normal can be ascribed wholly or mainly to direct results of demonstrable or inferred structural within the central nervous system or else- Even when such physical disease is found the is not complete According to his personality an individual will develop a mental state that be pathological in response to his awareness that he ically defective and to the sociological or economic of such defect thus building a functional mental upon an organic foundation Furthermore, al disease of or injury to the brain may release or ate abnormal personality deviations the tendency has long existed A complete diagnosis must re take all these considerations into account, and questions must be answered after detailed history- and complete physical examination Are the subjective symptoms and the observed mental , with or without somatic disturbance of ion

Solely psychogenic, and if so of what type and why?
2 Solely due to disease of the patient's tissues?
Due to a combination of 1 and 2, and if so, in what ions?

Accurate prognosis and intelligent treatment hang upon correct answers to these questions Errors of diagnosis may, and do from time to time, occur in every branch of medicine, but in my experience far more failures to diagnose, erroneous diagnoses and incomplete diagnoses arise from absence of a psychological approach to every patient than from its presence To deal more specifically with the 7 cases cited

Case 1 had clearly had a psychogenic illness 24 years before which had gradually improved When he came to the hospital shortly before his death he was suffering from a terminal toxic state, which did not obscure the diagnosis of advanced pulmonary tuberculosis Case 2 was a mixed case, in which organic element had been missed, but for how long it is impossible to say Case 3 was obviously organic from the start and neither should have nor did give rise to a missed diagnosis Case 4 had a symptomatology highly suggestive of organic mental disorder Case 5 could have been mistaken a non-organic depression but only so long as physical ion was omitted Case 6 had symptoms indicative an organic psychosis Case 7 could easily have been mistaken for hysteria, but this is so with most early cases of disseminated sclerosis, as is well known even by those who [illegible] to a psychological approach to disease

Dr Hulbert's belief in the need for a corrective does not appear to be well founded

Harley Street, W 1
B BUCKLEY SHARP

PSYCHOLOGY AND CHILDBIRTH

SIR,—To many of us ordinary practitioners it is becoming increasingly obvious that the majority of psychologists are living in a world of their own and the extracts from Dr Ernest Jones's address to the West Sussex Midwives Association in your issue of June 6 came therefore as less of a surprise than confirmation of this growing belief Having spent many years in contact with children of all ages, and having in mind the fact that I was one myself I cannot accept the statement that children know instinctively how babies are born. It is my conviction that the majority of healthy boys and girls spend a good deal of time trying to find out how this interesting operation takes place and I have yet to discover the small boy who regards any girl with envy unless she happens to be a better cricketer, can run faster or climb higher than he can Most ordinary small boys look upon most ordinary small girls with some degree of scorn Again has any ordinary doctor or parent ever heard the average small girl express a desire to possess a penis? Some have passed the remark that it seemed to be "a handy little thing" but rather a nuisance as an appendage, and I have yet to find the boy or man who envied the female's capacity to give birth to children Much more commonly heard are thanks to Providence for having spared us this same capacity

No, the trouble with some psychologists appears to me that they are losing contact with the species as a whole and are living in a pathological mirage from which from time to time they throw off reflexions on the behaviour of their fellow spectres

London, W 8
W L SCOTT

SIR,—Dr Jones explains how a woman's experiences in early childhood, buried in the unconscious mind through puberty and adolescence can influence the course of her labour and even, it may be, favour the development of toxæmia of pregnancy or an inert labour These correlations have long been known to obstetricians and are mentioned in modern textbooks but it is time the clinician faced up to them The psyche is one part of the neuro-endocrinium pregnancy and labour are controlled by hormones which influence the brain too, the seat of the psyche Abnormal pregnancy and abnormal labour may be the expression of an unbalanced hormone metabolism The hormones elaborated in the ovaries play a part only at the very beginning of pregnancy, it is the hormones of the placenta and especially the oxytocic principles produced in the posterior lobe of the hypophysis that are of paramount importance during pregnancy and labour The placenta has no nervous connexion with the rest of the body but the hypophysis is connected by three nerve tracts, one of them sympathetic, with the hypothalamic region

We do not know to what extent neurohormones mediate between hypothalamus and hypophysis, but we do know that in the hypothalamus (a very ancient structure) reside the mechanisms of the more primitive psychical reactions In Foster Kennedy's words "the hypothalamus is concerned with reactions of defence aggression suspicion, fear anger, sex, and as a neuro-glandular instrument the hypothalamus is in command of all the vital rhythms" Normally the hypothalamus with its metronomic and timing function is under the inhibitory influence of the 'better educated frontal lobe of the brain" But the emotional happenings during pregnancy and labour disturb the swinging of the pendulum, through the nerve tracts I have mentioned and probably by way of neurohormones, accelerating or slowing down the release of oxytocic principles in the posterior lobe of the pituitary gland The hormone balance is disturbed and the pregnancy or labour becomes abnormal Deficiency or abundance or irregular release of the hormones is the ruling factor and it is in this way that psychic factors influence pregnancy and labour But no good obstetrician would dream of ignoring the other well-known clinical causes of these abnormalities, transferring his entire attention from the pelvis to the brain and subconscious mind of his patient

London, W 1
ALFRED A LOESER

Obituary

CHARRINGTON CECIL KIRBY

M B LOND , SURGEON LIEUTENANT, R N V R

Surgeon Lieutenant Kirby was reported missing, believed killed, with the loss of HMS *Cornwall* He was educated on the science side at Oakham School 1927–31 and qualified MRCS in 1937 from St Mary s Hospital, where he gained the prize in psychological medicine He was then RMO at Kingston Hospital while working for the London MB At St Mary's he was house-surgeon to Mr Dickson Wright, casualty house-surgeon and clinical assistant to Mr V H Ellis in the orthopædic department where he discovered his main interest In 1940 he was commissioned to the Navy and was attached to the Marines serving off Norway and in the Atlantic His surgical chiefs write of him as one of those men whose keenness and enthusiasm gave promise of future distinction and whose absence will be much missed after the war "We all remember his quiet smile and low voice and his gentle sense of humour "

JAMES FREDERICK NEWMAN

M B BIRM , SURGEON LIEUTENANT, R N V R

Surgeon Lieutenant J F Newman, who was reported missing, is now presumed to have been killed on active service when his ship, HMS *Esk*, was sunk in the North Sea by enemy action in September, 1940 He was the eldest son of W F Newman of Streetly, Staffs, and was born at Gloucester on May 1, 1914 He was educated at Wycliffe College and Birmingham University, where he graduated MB, Ch B in 1938 After qualifying he held resident appointments at the Staffordshire General Infirmary, first as house-physician and later as house-surgeon He joined the RNVR in March, 1939, and on mobilisation in September was posted to the destroyer *Esk*, which took part in the first battle of Narvik, and also the Dunkirk evacuation Before sailing he married his fellow-student, Joan Johnston Lockley of Wolverhampton, who qualified MB, Ch B in 1937 and then held resident appointments in Birmingham

JAMES KERR LOVE

M D , LL D GLASG , F R F P S

Dr Kerr Love, who died on May 31 at West Kilbride in his 85th year, was born and brought up at Beith and lived all his life in or near Ayrshire, practising as an aural surgeon in Glasgow After qualifying there in 1880 he held house appointments on both sides of the Western Infirmary but within a year or two he was inquiring into the limits of hearing and the acoustics of musical sounds The Deaf and Dumb Institute claimed his services and he was soon aural surgeon to the Royal Infirmary and lecturing at St Mungo's College, In 1904 appeared a large and elegant textbook based on solid data of structure and function, warning the student and practitioner against the neglect of early suppuration in the ear But it was the deaf-mute who came to claim his attention to the exclusion of all else His manual on the Deaf Child (1911) contained a chart of many different children showing the various islands of active nerve tissue in their cochleæ and a chapter of great interest showing the various ways in which the working of thought, hearing and speech is carried on in normal and abnormal children, making full use of the cases of Helen Keller and Laura Bridgeman Twenty years later he had the satisfaction of entertaining Dr Keller (with her teacher Mrs Sullivan Macy) when the university of Glasgow recognised with an honorary degree her far-reaching work for the deaf-mute as had already recognised his What was the mann of man who achieved all this? J M M K writes "A distinguished as was his work was his tall spare figu and his aquiline features Although he certainly live laborious days he by no means scorned delights He loved his fellow men and enjoyed an informal medic dinner, a round of golf, or tramping over the countryside especially in his beloved Ayrshire Well balanced in al things and singularly devoid of any attempt to impres he was held in high regard by all who knew him.' He was in fact a worthy successor of the Abbé de l'Epé who in 1760 founded in Paris the first school for th teaching of deaf children During the last war Ker Love served in the 4th Scottish General Hospital w the rank of major - In 1887 he had married Jane Paxt daughter of Joseph Corbett, D D , incumbent of Campl Church, Glasgow He leaves his widow with th daughters

Notes and News

SURGICAL LESIONS OF THE SPINAL COR

In his Honyman-Gillespie lecture in Edinburgh on M 28 Mr G L Alexander discussed surgical lesions of t spinal cord and nerve-roots Too often in the past, said, surgical treatment has been delayed until blad symptoms develop—which he finds no more excusal than delay in dealing with a gangrenous appendix T important part played by circulatory disturbances wit the cord in the development of symptoms and signs is n commonly realised , early features are caused by lo congestion, suboxæmia, and probably œdema , continu ischæmia leads to permanent destruction In some cas this destruction proceeds disastrously—perhaps in matter of minutes—and the moulding cord is no long able to maintain itself in the face of increasing pressu After lumbar puncture a definite upper level of senso loss may become apparent for the first time Lumb manometry is the most important accessory method investigation, he thinks, since the finding of a partial complete spinal subarachnoid fluid block often provid final and conclusive evidence that a space-occupyi lesion is present Combined cisternal and lumb manometry is helpful in some cases The use of iodis oil in conjunction with radiography is becoming l popular owing to occasional cases of persistent lumb sacral radiculitis , but more stable oils are being veloped, and it is now the practice to aspirate the after it has settled into the lumbar sac When, as a res of injury to the vertebræ, there is pressure on the co operation should be early unless the lumbar fluid conta much blood (indicating irreparable damage to neu structures) or unless there has been immediate to abrogation of motor and sensory function below the le of the injury Skeletal traction in the long axis of t trunk should be reserved for cases of compression fractu showing only slight neurological dysfunction The intr duction of traction to the skull has been a great advan

The inexact term " spinal tumour " embraces a varie of neoplasms , if secondary malignant disease is cluded most tumours are benign and can be extirpat completely X-ray therapy is useful in the less favou able types but even here surgery is necessary for the rel of pressure and for biopsy of the tumour The spi tumour syndrome is typically one of progressive senso and motor dysfunction referable to the spinal cord nerve-roots, and localised root-pains are often among t earliest symptoms Early loss of pain and thermal se sation suggest an intramedullary lesion, but with creasing experience neurosurgeons are becoming le confident in their preoperative opinion of the morb anatomy in cases of spinal tumour In a few cases an complete Brown-Séquard syndrome suggests an intrins lesion, but benign extramedullary tumours are al responsible for this syndrome It was only when pr trusion of the nucleus pulposus came to be recognised an ætiological factor among the sciaticas that path logical states of the lower lumbar intervertebral discs we found to be common , 76% of disc protrusions are fou either at the 4–5 lumbar or the lumbosacral interspac

t with the clinical picture of lumbo-
complaining of recurrent attacks of
and paræsthesia in the lower lumbar and
root fields, a history of back strain is not
In a typical case there is evidence of an
lesion of the lumbosacral roots, lumbar fluid
protein reading approximating to the normal
vour of a disc protrusion whereas a raised protein,
with a raised cell count, is more suggestive of
toxi inflammatory radiculitis Radiological
is not of much value except in excluding
of the sacrum or vertebræ, and until better
oil becomes available for use in radiology it is
in his opinion, to rely on clinical judgment
methods have changed from laminectomy
ectomy and recently to the fenestration
with excision of the ligamenta flava only In
da operation should be undertaken within a
urs of birth but only cases without extensive
of the limbs should be selected A patulous
absence of the anal reflex or constant dribbling
are contra-indications to operation Discussing
perative care of the bladder in spinal cases,
Alexander advocated tidal drainage Exercises for
back, graded physical training and occupational
y not only tone up muscles but are of great value
mental stimulus

ULCERATIVE COLITIS

opening a discussion at the Manchester Medical
on May 6 Mr Peter G. McEvedy, FRCS, said
ative colitis is a disease about which much is
own, the diagnosis being often incomplete and
ty high Basing his remarks on 71 cases
ve been under his care in the last five years, he
that with a more complete anatomical and
al diagnosis and more active treatment the
could be greatly reduced and the complete
increased Anatomically, the disease starts in the
and commonly spreads to involve the whole
rarely the lower end of the ileum Inflammation
in the mucosa and may spread to involve all coats
colon His cases could be divided into the four
1) proctitis, (2) left half of colon, (3) whole
, (4) segmental The bowel symptoms in each
were as would be expected and the general
the results of toxæmia, loss of blood, disturbed
on and lack of sleep The diagnosis must be
ed by proctoscopic, sigmoidoscopic, radiographic
ological examinations Proctoscopic examina-
confirms the diagnosis except in the segmental
in which radiography is essential In the seriously
ts barium enemata may be harmful and
oscopy dangerous The treatment may be
up under the headings of body rest, rest to the
part, balanced diet, chemotherapy, free exit of
and removal of the inflamed part The first and
important consideration is to confine the patient
preferably on an open-air balcony The diet
be the most nourishing that can be taken with the
um of residue and added vitamins Methods of
with inflammation in the colon are debatable,
v, with or without colectomy, cæcostomy,
my, and appendicostomy have been proposed
y certainly rests the colon and the inflamed
can be removed by colectomy, theoretically it is
ideal treatment The mortality is high and the
with a permanent ileostomy is not in a happy
The operation should be reserved for complica-
such as strictures and polyposis, and for patients
are obviously failing to answer to other less drastic
of treatment In Mr McEvedy's experience
my is a definite help in curing an attack but when
cæcostomy is closed the disease returns with increased
y This operation should be abandoned The
applies to colostomy Appendicostomy allows the
to be washed out in the most satisfactory way
the least discomfort to the patient and permits
application to the colon This operation has not
the favour it deserves because surgeons generally
neglected the finer points of the operation, the
ent has not been thorough, the relapses
not been treated promptly and too often the
my has been allowed to close He gives

cases with proctit
of sulphanilamic
usually retained
results have beer
appendicostomy
evening the color
pint of saline
powder Sulpha
have proved disa
died in the last
part of the treatr

University of Ca

Titles of the de
on Miss E Rhode

Royal College o

At a meeting of
with Sir Alfred W
was announced t
Surgeon Commanc
ian lecture on bl
granted on the r
fellowship, was a
Lord-Moyne, Si
elected Hunterian
Wakeley was app
court of the Uni
representative on
Diplomas of fell
S G French, G N
H A C Chalmers
J M Fitton W I
bury, A B Watson,
Diplomas of n
Shrimpton and F
jointly with the
lowing —
Helen M B Alcoc
J R J Beddard, S
Coleman Florence I
Ebsworth, Phyllis I
Gilchrist, G P Goc
E W Inglis, Edith
Norah K Priestley,
A E Ward, Freder

Royal College of

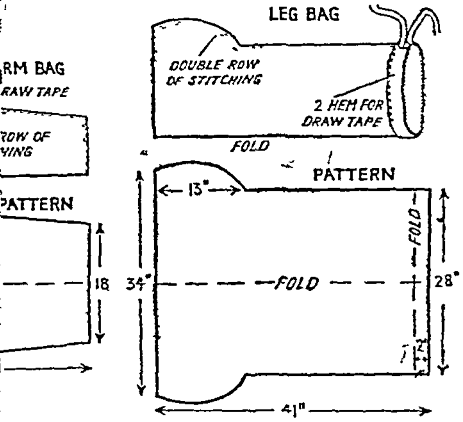
On June 9 Mr
president in succe
Sheridan, chairma
Kingdom, was ele
college Mr She
surgeon to becom

Ophthalmologic

The annual cong
United Kingdom
on May 29 and 30,
in the chair The
on the value of su
Major G I Scott,
of the drugs and r
been conducted l
Sorsby maintained
torum has been e
of sulphonamides,
White Oak Hosp
the use of sulphon
the local use of '
The discussion w
at which Dr Pe
Arnold Lawson tr
secretary for 1942
council
In the afternoon
by Prof W J B
of fatty changes in
a case of white m
investigation, and
paper on the diagr
discussion Mr
piece of work on r
Philps advocating
the vitreous cham
dissenting comme

---

ge the surgeon may require a patient with
ne upper limb to carry out occupational
bag which stops short just above the
umb may then be used The wound is
to be less offensive by this time, and the
equately controlled by the incomplete bag.
to recondition the cloth by steam steril-
l by washing in weak ammonia solution,
ated is little if any less effective than new
the process of reconditioning is not



—the labour involved is more than the cloth
ill a cheap material), the process involves
infected unwashed cloth into a steriliser
d care to use the same steriliser for clean
under present conditions most hospital
to be used for all purposes), and finally,
rather readily after sterilisation

* * *

s ago Dr J G Johnstone of the Ministry
ured into the experience of surgeons at
e Emergency Scheme who had used the
o them by the ministry The replies were
nd instructive Twenty-one hospitals
y satisfied At three hospitals the staff
only a few cases but their experience, so
was encouraging At sixteen hospitals
were available but it had not been found
e it, from which we infer that the com-
treated were not very serious or that the
ts were not fussy about unpleasant smells
its were received
s at present supplied by the Ministry of
tals in the EMS and Fighting Services

R THE WAR-TIME USE OF COTTON LIGATURES

A. PANNETT, MD LOND, FRCS
GERY IN THE UNIVERSITY OF LONDON, SURGEON TO ST MARY'S HOSPITAL

ar began in 1939 the likelihood that in
supplies of catgut might be interfered
ise of cotton in one unit of an emergency
London area The advantages in war-
s The material is cheap, easy to obtain
icult to manufacture than catgut It is
preserving fluid has to be manufactured,
tubes to be made, filled and sealed, nor
ult and intricate method of sterilisation
by the manufacturer before the material
e surgeon, all of which things mean that
s are prevented from engaging in some
ectly assisting the war effort It is
n gut because what is left over from an
be used on some subsequent occasion
erilisation
rt from war-effort considerations cotton
nsic claims to be considered the material
rgical ligatures or sutures During the
years several investigations have been
ing that the reaction of the tissues to

Obituary

CHARRINGTON CECIL KIRBY

M B LOND , SURGEON LIEUTENANT, R N V R

Surgeon Lieutenant Kirby was reported missing, believed killed, with the loss of HMS *Cornwall* He was educated on the science side at Oakham School 1927–31 and qualified MRCS in 1937 from St Mary's Hospital, where he gained the prize in psychological medicine He was then RMO at Kingston Hospital while working for the London MB At St Mary's he was house-surgeon to Mr Dickson Wright, casualty house-surgeon and clinical assistant to Mr V H Ellis in the orthopædic department where he discovered his main interest In 1940 he was commissioned to the Navy and was attached to the Marines serving off Norway and in the Atlantic His surgical chiefs write of him as one of those men whose keenness and enthusiasm gave promise of future distinction and whose absence will be much missed after the war "We all remember his quiet smile and low voice and his gentle sense of humour "

JAMES FREDERICK NEWMAN

M B BIRM , SURGEON LIEUTENANT, R N V R

Surgeon Lieutenant J F Newman, who was reported missing, is now presumed to have been killed on active service when his ship, HMS *Esk*, was sunk in the North Sea by enemy action in September, 1940 He was the eldest son of W F Newman of Streetly, Staffs, and was born at Gloucester on May 1, 1914 He was educated at Wycliffe College and Birmingham University, where he graduated MB, Ch B in 1938 After qualifying he held resident appointments at the Staffordshire General Infirmary, first as house-physician and later as house-surgeon He joined the RNVR in March, 1939, and on mobilisation in September was posted to the destroyer *Esk*, which took part in the first battle of Narvik, and also the Dunkirk evacuation Before sailing he married his fellow-student, Joan Johnston Lockley of Wolverhampton, who qualified MB, Ch B in 1937 and then held resident appointments in Birmingham

JAMES KERR LOVE

M D, LL D GLASG , F R F P S

Dr Kerr Love, who died on May 31 at West Kilbride in his 85th year, was born and brought up at Beith and lived all his life in or near Ayrshire, practising as an aural surgeon in Glasgow After qualifying there in 1880 he held house appointments on both sides of the Western Infirmary but within a year or two he was inquiring into the limits of hearing and the acoustics of musical sounds The Deaf and Dumb Institute claimed his services and he was soon aural surgeon to the Royal Infirmary and lecturing at St Mungo's College, In 1904 appeared a large and elegant textbook based on solid data of structure and function, warning the student and practitioner against the neglect of early suppuration in the ear But it was the *deaf-mute* who came to claim his attention to the exclusion of all else His manual on the Deaf Child (1911) contained a chart of many different children showing the various islands of active nerve tissue in their cochleæ and a chapter of great interest showing the various ways in which the working of thought, hearing and speech is carried on in normal and abnormal children, making full use of the cases of Helen Keller and Laura Bridgman Twenty years later he had the satisfaction of entertaining Dr Keller (with her teacher Mrs Sullivan Macy) when th university of Glasgow recognised with an honorar degree her far-reaching work for the deaf-mute as had already recognised his What was the mann of man who achieved all this? J M M K writes " distinguished as was his work was his tall spare figu and his aquiline features Although he certainly live laborious days he by no means scorned delights He loved his fellow men and enjoyed an informal medica dinner, a round of golf, or tramping over the countrysid especially in his beloved Ayrshire Well balanced in a things and singularly devoid of any attempt to impr he was held in high regard by all who knew him He was in fact a worthy successor of the Abbe de l'Ep who in 1760 founded in Paris the first school for t teaching of deaf children During the last war K Love served in the 4th Scottish General Hospital wi the rank of major In 1887 he had married Jane Paxt daughter of Joseph Corbett, D D , incumbent of Campb Church, Glasgow He leaves his widow with th daughters

Notes and News

SURGICAL LESIONS OF THE SPINAL COR

IN his Honyman-Gillespie lecture in Edinburgh on M 28 Mr G L Alexander discussed surgical lesions of t spinal cord and nerve-roots *Too often in the past,* said, surgical treatment has been delayed until bladd symptoms develop—which he finds no more excusab *than delay in dealing with a gangrenous appendix* T important part played by circulatory disturbances with the cord in the development of symptoms and signs is n commonly realised , early features are caused by loc congestion, suboxæmia, and probably œdema , continu ischæmia leads to permanent destruction In some cas this destruction proceeds disastrously—perhaps in matter of minutes—and the moulding cord is no long able to maintain itself in the face of increasing pressu After lumbar puncture a definite upper level of senso loss may become apparent for the first time Lumb manometry is the most important accessory method investigation, he thinks, since the finding of a partial complete spinal subarachnoid fluid block often provid final and conclusive evidence that a space-occupyi lesion is present Combined cisternal and lumb *manometry is helpful in some cases* The use of iodise oil in conjunction with radiography is becoming le popular owing to occasional cases of persistent lumb sacral radiculitis , but more stable oils are being d veloped, and it is now the practice to aspirate *the* after it has settled into the lumbar sac When, as a resu of injury to the vertebræ, there is pressure on the co operation should be early unless the lumbar fluid contai much blood (indicating irreparable damage to neur structures) or unless there has been immediate tot abrogation of motor and sensory function below the lev of the injury Skeletal traction in the long axis of t trunk should be reserved for cases of compression fractu showing only slight neurological dysfunction The intr duction of traction to the skull has been a great advanc

The inexact term " spinal tumour " embraces a variet of *neoplasms , if secondary malignant* disease is e cluded most tumours are benign and can be extirpate completely X-ray therapy is useful *in the less favou* able types but even here surgery is necessary for the reli of pressure and for biopsy of the tumour The spin tumour syndrome is typically one of progressive senso and motor dysfunction referable to the spinal cord nerve-roots, and localised root-pains are often among th earliest symptoms Early loss of pain and thermal sen sation suggest an intramedullary lesion, but with i creasing experience neurosurgeons are becoming le confident in *their preoperative opinion* of the morb anatomy in cases of spinal tumour In a few cases an complete Brown-Séquard syndrome suggests an intr lesion, but benign extramedullary tumours are responsible for this syndrome It was only when p trusion of the nucleus pulposus *came to be* recognised an ætiological factor among the sciaticas that pa logical states of the lower lumbar intervertebral discs w found to be common , 76% of disc protrusions are fo either at the 4–5 lumbar or the lumbosacral intersp milk of women and animals suffering from vitamin-B deficiency contains a toxic substance, their general conclusion being that such milk is not only lacking in vitamin but also contains some poisonous substance (Asakura and Osako 1932–33) This hypothecated toxin was shown to be methylglyoxal by Suzuki and Takamatsu (1934) They found that large doses of vitamin B diminished the methylglyoxal content of the milk, and later Ormo (1939), specifying vitamin B_1, showed that the same is true of the urine He also produced evidence that apparently healthy women suspected of vitamin-B deficiency yielded milk with low values for glyoxalase, values which could be raised by the administration of vitamin B Animal experiments carried out by the Japanese supported their findings in women Takamatsu and Sato (1934) demonstrated that methylglyoxal administered to rabbits produced pathological changes in the heart analogous to those found in infantile beriberi, but that they were prevented if vitamin B were given, though in some cases it was necessary to add 'Yakriton,' the detoxicating hormone of the liver This fact and that the vitamin-B preparation is not pecified are worthy of note

Most of the work of these Japanese investigators has never been repeated by others and appears to have received little attention elsewhere It is referred to, however, by Mrs Lydia Fehily (1940, 1941), as the result of observations made in China she had become an adherent of the toxic milk theory of the Japanese This was however anticipated by Vogt-Møller (1931) of Denmark, who, after pointing out that nowhere in the literature had an association between methylglyoxal intoxication and beriberi been suggested, put forward the hypothesis that the symptoms of that disease—a B_1 deficiency—were due to poisoning by methylglyoxal which accumulated in consequence of a failure of normal dismutation by the enzyme glyoxalase and its coenzyme glutathione, believing that the fault lay with the coenzyme rather than the enzyme This failure could be overcome by the administration of extracts of rice polishings or Peters' extract of yeast, though the reactions involved were unknown Peters himself (1936) remarked "It is still possible that methylglyoxal may arise as a result of some deficiency of the vitamin-B complex other than B_1," and Platt and Lu (1936, 1937) referred to the possibility of bisulphite-binding substances (BBS), other than pyruvic acid, found in the blood of beriberi patients, being due either to deranged metabolism owing to a vitamin-B_1 deficiency or derived from pyruvic acid or produced by some other associated deficiency

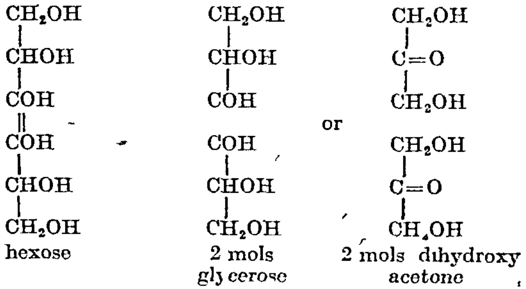
The original researches of Peters and his colleagues at Oxford on vitamin-B_1 deficiency in pigeons and the associated accumulation of pyruvic acid in the brain of those birds appears to have rather overshadowed other possible aspects of the problem The investigations of Platt and Lu (1939a) in Shanghai were primarily directed towards pyruvic acid, but their estimation of the total BBS in beriberi revealed a number of interesting points in view of the fact that BBS or carbonyl compounds, include acetone, acetoacetic acid, β-hydroxybutyric acid, acetaldehyde, α-ketoglutaric acid, glyceraldehyde, dihydroxyacetone and methylglyoxal (= pyruvic aldehyde), some of which are known to be intermediary substances in the breakdown of carbohydrate They showed that in the blood and urine of beriberi patients there is a 3- to 4-fold increase of BBS, greater in acute than in subacute cases, this increase is greater than is accounted for by pyruvic acid, whereas the pyruvic acid values may be restored to normal by the administration of vitamin-B_1, there may be but a slight reduction in the total BBS Further (1939b) exercise in vitamin-B_1 deficient subjects caused a high rise in pyruvic acid and other BBS accompanied by clinical manifestations of fulminating beriberi with cardiac symptoms These observers came to the conclusion that though pyruvic acid accumulation in the blood is a specific sign of B_1 deficiency, it is unlikely to be the direct cause of the cardiac symptoms Unfortunately at this point their researches came to an end, and, with the exception that methylglyoxal was identified in the blood of beriberi patients and in the milk of vitamin-B_1 deficient mothers further investigations into the nature of the BBS other than pyruvic acid, were not carried out They were inclined to believe that the increased amount of pyruvic acid in the blood of beriberi patients came from some other source than the brain (unlike experimental pigeons)

MUSCLE AS A SOURCE OF TOXIN

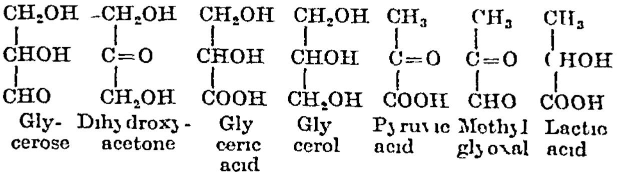
Now one of the most striking clinical facts (already mentioned above) long known to those familiar with the disease, is the history of muscular work in precipitating the onset of acute cardiac breakdown Not only is this true of acute cardiac beriberi in the adult in the Orient but it has been noted in cases of the disease in the United States in which the "beriberi heart" syndrome has been described This association is most significant It suggests that the pyruvic acid and other BBS, including methylglyoxal, are formed during the breakdown of carbohydrate in skeletal or heart muscle The normal metabolism of glycogen in muscle is a complicated process involving the action of a number of enzymes with the formation of phosphorylated hexoses and trioses and the release of energy Four-fifths of the glycogen broken down is normally resynthesised, the other fifth being oxidised to supply the energy necessary for the resynthesis The scheme as generally set out is as follows (adapted from W V Thorpe's Biochemistry)

1 Glycogen → hexose
2 Hexose + phosphoric acid → hexose monophosphate
3 Hexose monophosphate + phosphoric acid → hexose diphosphate
4 Hexose diphosphate → 2 mols glycerose phosphate or 2 mols dihydroxyacetone phosphate
5 Glycerose phosphate + dihydroxyacetone phosphate → glyceric acid phosphate + glycerol phosphate
6 Glyceric acid phosphate → pyruvic acid + phosphoric acid
7 Pyruvic acid + glycerol phosphate → lactic acid + glycerose phosphate
8 Glycerose phosphate → glyceric acid phosphate + glycerol phosphate to lactic acid as in 6 and 7 and so on

The splitting of hexose into 2 mols of triose can be represented thus



The relationship of these two trioses, glycerose (glyceraldehyde) and dihydroxyacetone, to other 3-carbon compounds including methylglyoxal (pyruvic aldehyde) is apparent by a glance at the formulæ



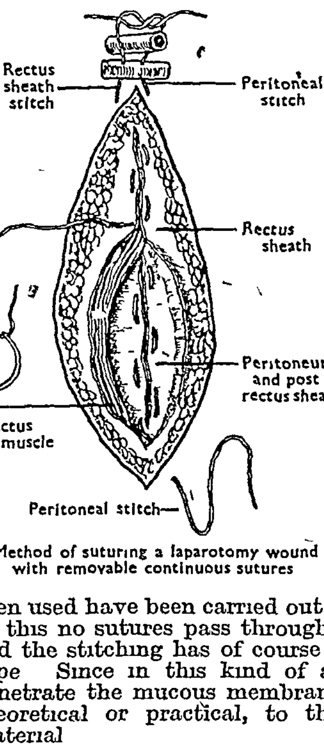
Though methylglyoxal finds no place in the scheme above, that it is an intermediate product in carbohydrate metabolism seems certain Whether in fact it should find a place in that scheme or be considered as an intermediate stage in some alternative path of carbohydrate breakdown is not established Comparatively little is known of methylglyoxal but Gaddie and Stewart (1934) have shown that cardiac muscle utilises the energy derived from the conversion of this substance to lactic acid They state further (1935) that, in the absence of glutathione methylglyoxal accumulates It appears possible therefore that the accumulation of methylglyoxal in beriberi is directly due to a failure of glutathione, the glyoxalase coenzyme as originally suggested by Vogt-Moller In acute cardiac beriberi of the adult glutathione failure and methylglyoxal accumulation would occur in the body of the patient In infantile beriberi, the suckling would receive in its mother's cotton is much less than to catgut, less even than that evoked by silk Unirritated by chemical substances used in the preparation or preservation of the gut or the products of the digestion of the gut itself, the tissues respond solely to the stimulus of the injury and proceed undisturbed with the business of repair These experiments have led to its use in human surgery and with conspicuous satisfaction Ochsner (jun) was one of the first to advocate its use and he has been followed by a few other surgeons

When using an unabsorbable ligature material two precautions must be taken They were laid down by Halstead for the use of silk many years ago, but hold good for cotton The smallest effective sizes should be used and the stitches should be interrupted Thin cotton can be used because the material is of great strength The actual sizes employed have been nos 24, 40 and 60 No 24 is the thickest and is used for the suture of the abdominal wall and for such purposes as the repair of hernias, or the ligation of the larger vessels No 40 is used for suturing the alimentary canal, for ligating mesenteries and such things No 60 is for ligating small arteries such as those in the subcutaneous tissue

TECHNIQUE

The necessity for always using interrupted sutures will be raised as an objection by many surgeons on the score that they are time-consuming This is undoubtedly true, but when facility has been acquired in the changed technique the prolongation of the operation is not great In closing the abdomen this delay is most noticeable The peritoneum is first brought together by interrupted mattress sutures. All these stitches are put in before one is tied, because the thin hard cotton might cut through the tissues were each one tied as it is inserted If all the untied sutures are pulled on at once the strain on each becomes small, the sides of the wound come easily together, and the tying very simple and sure The rectus sheath, when as usually the rectus muscle has been retracted, is sewn up in a similar fashion

All the enterectomies, gastrectomies, and gastro-jejunostomies where cotton has been used have been carried out by an aseptic technique In this no sutures pass through the mucous membrane and the stitching has of course been of the interrupted type Since in this kind of anastomosis no stitches penetrate the mucous membrane there is no objection, theoretical or practical, to the use of unabsorbable material



Method of suturing a laparotomy wound with removable continuous sutures

If a surgeon feels that the labour of inserting interrupted sutures for the closure of the abdominal wall is too irksome, the following simple method will relieve him (see figure)

Continuous mattress sutures of no 30 or 40 Barbour's linen thread are passed through the peritoneum and the anterior rectus sheath, and at each end of the wound they emerge from the surface of the skin where they are first passed through a short piece of rubber tube and then tied over another short piece These sutures are allowed to remain in place for ten days They are then cut at one end and pulled out from the other Such material is only a little more irritant than cotton and there is the further advantage that at the end there is no foreign material left in the wound The linen thread is also cheap and is sterilised in the same way as the cotton This is done as follows

The cotton or thread is wound lengthwise round a piece of wood 13½ in by 2 in It is taken off thus and tied round at the two extremities of the loop with black, red or white cotton to mark the size Each skein is then threaded through a short length of rubber tubing and the cotton sterilised in the autoclave, preferably separately from the dressings When used, the two extremities of the loops are cut through, thus providing convenient lengths for single ligatures For tying a number of small vessels it is quicker to have the thinner sizes of cotton in longer lengths It should be used dry as it becomes very limp when wet

From a limited experience it appears that these thin cotton sutures may be used in septic wounds without the risk of persistent sinus formation Only one sinus has resulted It happened after the repair of an umbilical hernia in which the cotton, for greater strength, had been used double This doubling of the cotton appears to be unnecessary and may have been the cause of the long-lasting sinus which closed only when all the sutures had come away No trouble has occurred after using cotton to suture the abdominal wall after opening abdominal abscesses and in already infected wounds

---

INFANTILE BERIBERI AND BERIBERI HEART

HUGH S STANNUS, M D , PH D LOND , F R C P

SENIOR PHYSICIAN TO THE FRENCH HOSPITAL, LONDON

It is just over fifty years since Hirota (1888) described an affection in infants at the breast to which he gave the name "infantile beriberi" because many of the mothers subsequently developed that disease He believed that the condition in the infant was caused by a toxin in the mother's milk, for when removed from the breast the infant recovered Later, Hirota (1898) suggested that this malady in infants was closely akin to the acute cardiac type of beriberi in adults This observation we now know to be true, for though the acutely fatal illness of sucklings bears little resemblance to the vast proportion of cases of beriberi, the signs and symptoms as well as the pathological changes are analogous to the acute cardiac breakdown in fulminant adult beriberi This is true whether the adult case be studied in the Orient, in America or in this country, as a case of "beriberi heart" The condition described by Hirota was later designated by Japanese writers "breast-milk intoxication" It was then recognised by Guerrero (1904) as identical with the widespread fatal affection of infants in the Philippines called "taong" The wonderful results obtained by treatment with extracts of rice-polishings are recorded by Chamberlain and Vedder (1912), and reviewed by Albert (1931) That the disease was due to deficiency of vitamin B_1 seemed to be established

Next in importance came the observations of Bray (1928) which appear to have escaped the notice of many subsequent writers As the result of the action taken by the benevolent government of the Australian mandated central pacific island of Nauru, which forced the "store fed," non-riceeating native inhabitants to give up their fermented "toddy" made from the cocoanut palm, infantile beriberi with high incidence and heavy mortality became a very serious problem Bray found that all the infants which developed the disease were breast-fed, that none received any supplementary feeding, that no infant removed from its mother at birth on account of leprosy, and artificially fed, became sick, and that none of the mothers and practically none of the adult native inhabitants showed any sign of beriberi, though the disease occurred among imported Chinese coolies The natives do no work but live in idleness on royalties paid on phosphates, their diet consisting of white flour, tinned meats and large quantities of sugar Having recognised the disease as infantile beriberi, Bray instituted treatment with an emulsion of yeast grown in "toddy," with dramatic results In view of the fact that chickens fed on the milk of the mothers developed polyneuritis, Bray concluded that these women were suffering from "latent beriberi"

THE TOXIC MILK THEORY

During the last dozen years a number of Japanese workers have sought to determine whether or not the disinclination for the breast with "spilling" of from the mouth while water is eagerly consumed retained, an increasing restlessness, abdominal especially over the liver and gastric distension by colicky pain, vomiting and paroxysmal , constipation and diminution of urinary , water retention so that the infant actually weight There follows acceleration of the heart up to 200 per minute, rapid breathing, dyspnœa by a peculiar grunting and aphonia due to of the larynx, cyanosis, signs of cardiac enlarge- pulmonary congestion and engorgement of the fluid in the serous cavities and generalised œdema come signs of increased intracranial pressure with rigidity, twitchings, drowsiness, coma and Each phase may only last a matter of hours and whole illness a day or two

REFERENCES

J (1931) *Philippine J Sci* 45, 297
K and Ohsako, H (1932–33) *Tohoku J exp Med* 20, 429
W R and Krishnan, B G (1941) *Ind J med Rep* 29, 763
J C (1942) *Lancet*, i 586
, G (1928) *Trans R Soc trop Med Hyg* 22, 9
W P and Vedder, E B (1912) *Bull Manila med Soc* 6, 26
G R. (1934) The Vitamin B Requirements of Man, London
R W and Phillips, P H (1938) *J Nutrit* 16, 585
L (1940) *Caduceus*, 19, 78, (1941) *Trans R Soc trop Med. Hyg* 35, 177, *J trop Med* 44 21
R and Stewart, C P (1934) *J Physiol* 80, 457, (1935) *Biochem J* 29 2101
, M (1904) Memoria, Manila
o H (1937) *Amer Heart J* 13, 580
R B (1938) *Trans R Soc trop Med* 31, 474
J (1888) Jika Kikkei Tokio, (1898) *Zbl inn Med* 19, 385
A M and Bramwell C (1939) *Brit Heart J* 1, 187
G and Sinclair, H M (1940) *Ibid*, 2, 231
G D (1939) *Biochem J* 33, 774
H and Senn, J E (1940) *Amer J Dis Child* 59, 97
R (1939) *Tohoku J exp Med* 35, 374
R A (1936) *Lancet*, i, 1161
B S and Lu, G D (1936) *Quart J Med* 5, 355, (1937) J 31, 1913; (1939a) *Ibid*, 33, 1523, (1939b) *Ibid*, p 1538
N L (1938) *Lancet*, i, 831
E F and Woodward G E (1939) *J Biochem* 129, 283.
H M (1939) *Biochem J* 33 202
E C and Rial, E J (1942) *Med J Aust* i, 3
T and Takamatsu, A (1934) *Tohoku J exp Med* 24, 202
, A and Sato, A (1934) *Ibid*, 23 506
S (1940) *J. Amer med Ass* 115, 832
and Wilkins, R W (1936) *Trans Ass Amer Phys* 51, 341, (1937a) *J Amer med Ass* 109, 786, (1937b) *Ann intern Med* 11, 104
R R and Spies T D (1938) Vitamin B_1 and its Uses in Medicine, London, (1939) *Proc Mayo Clin* 14, 787, (1940) *Arch int Med* 66, 785, (1941) *Proc Mayo Clin* 16 438

BASAL NARCOSIS
FOR TONSIL OPERATIONS ON CHILDREN

JOHN GERRIE
M B ABERD, F R C S F
AURAL SURGEON TO THE ABERDEEN ROYAL HOSPITAL FOR SICK CHILDREN

J ROSS MACKENZIE
M D ABERD, D A
LECTURER IN ANÆSTHETICS IN THE UNIVERSITY OF ABERDEEN, SENIOR ANÆSTHETIST TO THE HOSPITAL

IN many hospitals children subjected to tonsillectomy still sent home on the day of operation and insufficient on is given to the possible ill effects of this pro- The child's visit to hospital is commonly a wing experience Arriving early in the morning he with his parents and is shepherded into a room with dozen or more strange children He is undressed by a , receives a painful hypodermic injection and to the screams of his fellow patients as they him to the anæsthetic room Later he wakens another strange room with a sore throat and hears the wails of a dozen crying children Patients in Aberdeen Royal Hospital for Sick Children were subjected to a similar ordeal and we have ed evidence of the psychic trauma caused by regime While most of the children benefit physic- from the removal of diseased tonsils and adenoids, have told us that the reaction of their children ordinary mental and physical stimuli has altered after operation Ward sisters, teachers and family have all noticed that the subsequent behaviour some patients is governed by suspicion and distrust of in charge of them and we believe that the operation is often the stimulus for this change In addition children give a history of night terrors and nocturnal enuresis after tonsillectomy and the mere mention to such a patient of doctor or nurse or of a return visit to hospital, may cause obvious distress

The danger of persistent postoperative hæmorrhage from a tonsil bed in children treated as outpatients is more generally recognised This possibility and some instances of sudden death in patients soon after returning home induced the directors of the Hospital for Sick Children to provide a ward of 12 beds in order to retain tonsil cases for one night after operation This proved a beneficial advance since patients are now under supervision for at least 24 hours It soon became apparent, however, that we were still far from an ideal solution since much the same routine had to be continued Children were taken from their beds to the waiting-room, and one by one were carried struggling and terror-stricken to the anæsthetic room where they were smothered into submission by the anæsthetic agent

In order to protect patients as far as possible from the mental disturbances which we believe are inherent in the tonsil operation, we instituted a regime which makes use of basal narcosis For this purpose we tried paraldehyde per rectum for several years but its administration to a dozen cases at one session was a serious strain on the nursing staff and the dose was often not retained Over 600 children ranging from 9 months to 12 years have been treated with pentobarbital soluble ('Nembutal') by mouth and we believe this method of narcosis is safe and reliable Children require relatively larger doses than adults

TECHNIQUE

City patients arrive at the hospital at 8 A M, while children from the country are admitted on the previous afternoon They are undressed, weighed and put to bed No hypodermic injection is given unless dissection is contemplated, when it is given immediately before the basal narcotic At 9 A.M each patient receives by mouth a dose of 'Elixir Nembutal' (Abbott) equal to gr ¾ per stone of body-weight At 9 15 A M the ward is darkened and the side of each cot is let down in preparation for the noiseless removal of the patient to the anæsthetic room Patients over one year, who arrive in the afternoon, receive gr 1 of pentobarbital soluble in the evening and in the morning gr ½ per stone of body-weight plus gr ½ for any fraction of a stone A quarter of an hour after the administration of the narcotic most of the patients are drowsy and after half an hour all, except perhaps an extremely nervous child, are asleep At 10 15 the first patient is carried to the darkened theatre and is given ethyl chloride on a perhalation mask As soon as stertorous respiration appears a gag is inserted between the teeth and opened The tonsils are enucleated with the Layton hæmostatic guillotine and the adenoids curetted if necessary Blood is wiped out of the mouth and the patient is carried back to bed and the side of the cot put up Patients may cough and spit out some blood and occasionally they sit up in the cot for a few minutes but they quickly lie down and sleep until late afternoon

COMMENT

The elixir nembutal is pleasant to the palate but contains only gr 2 of pentobarbital soluble to the ounce and children weighing 3 stones may refuse to take six to eight teaspoonfuls, or having taken the dose may promptly reject it As an alternative a spoonful of extract of malt in which has been incorporated the dose of nembutal powder or a capsule of nembutal may be given In our experience the elixir nembutal is the most reliable method of administering a basal narcotic to young children It is essential that the technique of the administration be adhered to in detail A patient given pentobarbital soluble as a basal narcotic and allowed to remain in an undarkened or noisy general medical or surgical ward often comes to the theatre awake and even excited We have therefore arranged that such cases be removed to the aural department or to a side room near the theatre for basal narcosis Patients may be partially awake when they are moved to the theatre or when the anæsthesia is begun but they have a complete amnesia for the events following the administration of the basal narcotic

There is some depression of the respiration and children may remain asleep rather than proceed rapidly to surgical anæsthesia It is often necessary to stimulate the respiration by pushing forward the angle of the jaw There milk large doses of the substance but no glutathione to assist in its catalysis

GLUTATHIONE DEFICIENCY

The point is thus reached when the question arises—is there such a condition as a primary glutathione deficiency ? Or may a deficiency of available glutathione occur secondarily to some other disturbance of metabolism ? Glutathione is a sulphur-containing compound—glutamylcysteinylglycine—and is present normally in practically all the tissues and is synthesised in the body Whether a primary deficiency of this substance may occur as the result of a deficiency in the diet of one of its three constituents, glutamic acid, cysteine or glycine, is outside the scope of this article Some of the observations on infantile beriberi are suggestive of primary deficiency It is commonly stated that the acute cardiac manifestations in man and animals respond to treatment with vitamin-B_1, but in published work it is difficult to ascertain whether glutathione was excluded In earlier experimental work yeast—a substance rich in glutathione—was often used as the source of vitamin-B_1 In some experiments the preparation of the vitamin is not stated Again some of the Japanese workers found it necessary to add an extract of liver to their vitamin-B preparation Beriberi in the East was commonly treated with extracts of rice polishings, though the best results were those obtained by Bray with a local preparation of yeast which was found to be superior to ‘ Marmite ’ Yeast besides being a rich source of vitamin-B_1 possesses a glutathione content of 130 mg per 100 c cm , compared with liver 170, heart muscle 60 and skeletal muscle 30 mg (Schroeder and Woodward 1939)

It is similarly difficult to find a series of clear-cut cases of so-called “ beriberi heart ” described in America and this country, in which treatment with vitamin-B_1 has been given to the certain exclusion of glutathione The condition about which a good deal has been written in the United States is generally associated with alcoholism (Weiss and Wilkins 1936, 1937a b) and is thus described “ An acute pernicious cardiac breakdown may occur independently of any other recognised clinical signs of vitamin-B_1 deficiency ” The treatment adopted has consisted in the withdrawal of alcohol, a diet rich in vitamin-B_1, extracts rich in the same factor and crystalline vitamin-B_1, 5–10 mg three or four times a day Weiss (1940) found however that some of his patients improved with rest alone (and presumably food), others after digitalis and mercurial diuretics, but the maximum and most regular benefit was assured by rest in bed and massive subcutaneous doses of thiamine The case of acute pernicious cardiac beriberi described by Hashimoto (1937) and treated with 0 5 mg of crystalline vitamin-B_1 is often cited but it should be remarked that “ much relief ” of the cardiac symptoms followed 15 minutes after strychnine had been given and that the patient also received digitalis, strophanthus, camphor and caffeine In other cases the efficacy of treatment with thiamine is more definite Hawes (1938) treated successfully a few cases of adult fulminating cardiac beriberi with various preparations of vitamin B_1, including ‘ Betaxin ’ and Aykroyd and Krishnan (1941) have reported rapid response in cases of infantile beriberi in India to the injection of pure synthetic vitamin B_1 Of two cases of adult “ alcoholic beriberi heart ” lately recorded by Bowe (1942) one responded to intramuscular injections of ‘ Benerva ’ without other treatment except digitalis which by itself had failed The cases of beriberi heart published in this country include one by Jones and Bramwell (1939) successfully treated with 2 mg benerva intramuscularly each day to a total of 30 mg in 17 days, a group of cases by Konstam and Sinclair (1940) treated with a vitamin-full diet and thiamine Another case by Price (1938) received ‘ Marmite ’ and ‘ Bemax ’ but had already improved with rest in bed It therefore appears that relief both in acute adult cardiac beriberi and infantile beriberi follows the administration of thiamine, though in some the facts suggest that glutathione may have played a part

Looking at the other side of the question there is a good deal of evidence that methylglyoxal accumulation may be associated more directly with the pyruvic acid accumulation of vitamin-B_1 deficiency Is the former the result of the latter ? If pyruvic acid be removed by the administration of vitamin-B_1 does methylglyoxal then disappear ? Lu (1939) notes that in beriberi there may be a delay in the response of cardiac symptoms to treatment with vitamin-B_1 Is it possible that the pyruvic acid accumulation of vitamin-B_1 deficiency inhibits the catalysis of methylglyoxal, just as it is known to inhibit the action of lactic acid dehydrogenase and cause lactic-acid accumulation ? We should then suppose that in the case of the infantile beriberi of Nauru Island the mothers were suffering from a vitamin-B_1 deficiency (latent beriberi), that they accumulated pyruvic acid in their tissues which inhibited the action of glutathione on methylglyoxal and that while they themselves escaped symptoms, possibly as the result of excretion in their milk, their infants suffered “ methylglyoxal poisoning ” In this connexion, McNamara and Senn (1940) have shown that the glutathione concentration in the blood of normal infants decreases progressively throughout the first three months of life It is in the ninth, tenth and eleventh weeks of life that infantile beriberi appears

There has been much discussion concerning the normal vitamin-B_1 requirements of man, but it is generally agreed that the amount necessary for adequate nutrition bears a direct relationship to the calorific value of the dietary intake, often expressed as the ratio between the number of *IU* of vitamin B_1 and the number of non-fat calories in the diet (Cowgill 1934, Williams and Spies 1938, 1939, 1940, 1941, Slater and Rial 1942) Without going into a lot of figures, it appears certain that the Nauru women’s diet must have yielded a thiamine calorie ratio only just short of that associated with the onset of symptoms of beriberi, possibly in the neighbourhood of 0·3 The thiamine calorie ratio of the mother’s milk would be lower still and still further reduced by the large amount of sugar-water imbibed, as noted by Bray, since any factor which increases the thiamine requirements of the mother will lower the content of her milk Further, Bray noted that the values of lactose in the milk were high, the thiamine calorie ratio for the infant must therefore have been far below the figure for the prevention of beriberi Slater and Rial showed that normally the thiamine content of human milk rises by a third between the 3rd and the 11th and 12th weeks of lactation, though the calorific value of the milk remains unchanged They suggest that the infant is probably born with a store of vitamin B_1 which becomes depleted in the first three months of life, an interesting point in view of the age of onset of infantile beriberi It may be noted that cow’s milk contains 3–7 times the amount of thiamine in human milk

Is methylglyoxal toxic ? It was so held by Vogt-Møller who cites others to the same effect Japanese workers were of the same opinion and believed animal experiment proved the point On the other hand the cardiac symptoms in beriberi may be merely a matter of deprivation. Methylglyoxal may be an essential for normal metabolism in heart muscle, which in the absence of glutathione cannot be utilised with the result that the heart fails Or again methylglyoxal may exert some further deleterious action on metabolism After all it may be merely a matter of words—a toxin is toxic commonly because it interferes with some normal process of metabolism

* * *

Our views on the ætiology of beriberi may have to undergo before long considerable revision, not only in regard to cardiac manifestations but also concerning nervous changes, for according to Engell and Phillips (1938) the nerve degeneration in human beriberi is probably due to lack of dietetic factors other than vitamin B_1 Just as it proved incorrect to define pellagra in terms of nicotinic-acid deficiency, so it may prove wrong in regard to beriberi and vitamin-B_1 Sinclair (1939) remarks on “ the uselessness of most of the work done so far upon the amount of vitamin-B_1 in blood and serum” —a statement which may prove true of other sides of the problem Infantile beriberi is common in the Far East, as the annual medical report for Hong-Kong in 1940 demonstrated, and the Japanese occupation will almost certainly increase the incidence It is also likely to be found in some of the German-occupied countries of Europe Even in this country isolated cases of infantile beriberi may occur, and they would almost certainly fail to be recognised by anyone unfamiliar with the symptomatology, perhaps best described by Bray (1928) solution of thionin or other blue dye the papers appear to have a reddish tinge, and a screen of ammoniacal copper salt produces a neutral grey, but when such screens are used special care is required to arrange that the illumination of the test and comparison papers are equal. Care must be used to keep the test papers clean and away from any sulphanilamide powder, for the amounts of drug being estimated are only a small fraction of a microgramme. Two pieces of test paper can be applied to opposite sides of the drop to check that mixing has been perfect.

IN URINE

Although the chief merit of the method is the ease ith which blood estimations may be made, it may also e applied to urine, and test papers have already been ed in qualitative tests of urine in medical schools n developing the method to make it quantitative, the ifficulty was to find a reagent which would produce he required pH when mixed with an equal volume of ll sorts of urine—acid, alkaline, dilute or concentrated. hosphoric acid was found satisfactory.

Method.—10 c.mm. of urine is mixed with 10 c.mm. f 20% phosphoric acid and the test paper applied. sually the test will be too strong for accurate reading, nd a series of dilutions may be made, using the pH 1.4 uffer as diluent. Any convenient method may be used make serial 6- or 11-fold dilutions by adding 10 c.mm. f the mixture to 0.05 or 0.1 c.cm. of buffer in small ubes, and multiply the readings by the corresponding actor. Undiluted urines give a small blank value up o 5 mg. per 100 c.cm. in absence of sulphanilamide.

Estimations of the total drug are often required. If ydrolysis is undertaken, it is additionally worth while o use a macro method for the estimation. An estimate f the total drug excreted can also be made by taking dvantage of the fact that in many human urines the oncentration of total drug is approximately twice that f the free—thus the free drug may be estimated by the bove method and multiplied by 2 to give the total drug.

DISCUSSION

Morris (1941) has pointed out the errors in Werner's (1939) original method and has shown that for accuracy in the dimethylaminobenzaldehyde method the pH must be within the range of say 1.2–1.7, and that the amount of aldehyde must be constant. This is achieved here by the selection of a suitable precipitating agent, and the use of phosphoric acid as a buffer and of test papers containing an excess of aldehyde. The method needs care but tests may be made at the bedside by taking the blood directly into the pipette from a finger prick, and the result obtained at once. No apparatus apart from the pipette and test papers is required.

REFERENCES

Adams, R. and Coleman, G. H. (1922) *Organic Synth.* 2, 17.
Morris, C. J. (1941) *Biochem. J.* 35, 952.
Werner, A. E. A. (1939) *Lancet*, i, 18.
Wright, A. E. and Colebrook, L. (1921) Technique of the Teat and Capillary Glass Tube, London.

Addendum

LEONARD COLEBROOK, M.B. LOND.
LATE COLONEL R.A.M.C.

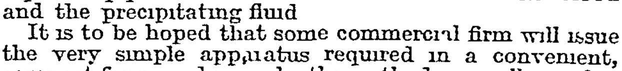
In America the practice of sulphonamide therapy has more often been guided by determinations of the sulphonamide content of the patient's blood than in this country; as a consequence, the Americans have been quicker than we to realise the importance of a large initial dose in treating an acute infection. I would suggest that there are two principal reasons for the rapid building up of an effective concentration in the blood—(1) that sulphonamide compounds exert much more effect on a small than a large number of organisms, so every hour counts if we are to overtake a rapidly developing infection; (2) that the sulphonamide compounds have a much greater effect at fever temperatures than at normal body temperature, so that the febrile period is the time for a blitzkrieg.

Since we know that there is considerable variation between individual patients in regard to absorption of the several compounds, their excretion, and the degree of acetylation occurring in the body, we can hardly do our best by any patient suffering from a serious infection unless we check the sulphonamide level of the blood at least twice within the first 36 hours—I would suggest, after 6–12 hours and after 30–36 hours—and, if necessary, adjust the dosage in accordance with our findings.

For this to be more than a counsel of perfection it is essential to have a simple procedure which can be carried out at the bedside within a few minutes and which does not necessitate obtaining blood from a vein. Dr. Fuller's micro method gives us such a procedure. It does not pretend to great accuracy; I doubt whether in its present form, it will really tell us more than whether the blood contains 2 or 5 or 10 mg. per 100 c.cm. of the drug. But that knowledge may often be invaluable, for if there is not 2 mg. per 100 c.cm. after six hours' treatment the dosage or the choice of drug or the route can be at once reconsidered.

Dr. Fuller has kindly given me the opportunity of trying out the method and although I have not yet done so on any large scale I am satisfied of its reliability, *with the safeguards he recommends*. These are important, and I would particularly emphasise the need to be on guard against possible contact of the test papers with minute traces of sulphanilamide, derived either from the air in the wards where sulphonamide powder is being used or from fingers or instruments. Perhaps this difficulty would be met if some firm would issue little strips of test paper of which the greater part is coated with paraffin wax and only a small tip left projecting, like a match-head, the strips being mounted in little books from which one at a time could be torn off as required and the "business end" applied to the drop of blood plus precipitating fluid without any contact with fingers. (The other, waxed end might possibly be used for mixing the two drops together.)

Perhaps I may offer one more tip for those whose fingers are unaccustomed to controlling a rubber teat.



It is easier to draw up fluid to the required mark in a pipette if a few "pilot volumes" separated by air bubbles, are drawn up first.

They will find it much easier to stop accurately at the required mark (particularly with the precipitating fluid) if they first take up several "pilot volumes," unmeasured and separated by air bubbles. Such volumes act as a brake (see figure). Finally, I would suggest that a separate pipette should always be used for the blood and the precipitating fluid.

It is to be hoped that some commercial firm will issue the very simple apparatus required in a convenient, compact form, and so make the method generally applicable. Even if it is only a stepping-stone to something better it will have served a useful purpose.

HERPES SIMPLEX VIRUS

SIMPLE METHOD FOR ADAPTING HUMAN STRAINS TO MICE

ALEX J. STEIGMAN,* M.D. TEMPLE UNIV. PHILADELPHIA
T. F. MCNAIR SCOTT,* M.D. CAMB., M.R.C.P.

(Department of Pediatrics, University of Pennsylvania School of Medicine and Children's Hospital of Philadelphia)

FOR the laboratory study of herpes-neutralising antibodies in human sera the mouse is one of the commonly used hosts. The following method of adapting human strains of the herpes simplex virus to mice seems therefore of value to those studying this problem.

The virus of herpes simplex can easily be isolated from patients by inoculating the suspected material on the scarified cornea of a rabbit secundum artem. The resulting reaction consists of a definite kerato-conjunctivitis with redness and thickening of the nictitating membrane often accompanied by a purulent exudate. In 1923 Friedenwald noted that for the first 4–5 days the exudate showed no bacteria when microscopically examined using Gram's stain. We were able to confirm this observation and also to show that no growth occurs when this exudate is suitably cultured for bacteria is definitely less tendency to respiratory spasm on the administration of ethyl chloride. Muscular relaxation is conspicuous and there is no difficulty with the introduction of the gag. It has been found that a smaller amount of the anæsthetic agent is required to produce surgical anæsthesia and this is more apparent in cases for dissection. Disorientation is uncommon. It may continue for a short time and require supervision but the patients invariably sleep well during the night after the operation.

---

* At present serving with the American Red Cross Harvard Field Hospital Unit in England.

In a busy hospital time is of great importance. Previously our team were accustomed to do twelve enucleations in 20 minutes. With basal narcosis and each patient carried asleep from the cot to the operation table, the same team still carries out a dozen enucleations in less than 30 minutes. The work has become easier and more pleasant. From our own observations and those of ward sisters, parents, family doctors and school teachers, we believe that psychic trauma can be practically eliminated from the tonsil operation on children by means of basal narcosis.

SUMMARY

Children undergoing tonsillectomy should not be treated as outpatients because of the emotional as well as physical dangers. Supervision for at least 24 hours is essential for such patients. Basal narcosis with an elixir of pentobarbital soluble was found to be safe and reliable and much more convenient than paraldehyde and we suggest that it should be used as a routine.

Over 600 cases have been successfully treated with benefit not only to the patients but also to the surgeon and anæsthetist. Parents appreciate the absence of postoperative mental upset.

We are indebted to Dr. Helen Harkins and Dr. Florence Stewart, aural house surgeons, for much assistance in this work.

RAPID CLINICAL METHOD FOR THE ESTIMATION OF SULPHANILAMIDE

A. T. FULLER, PH.D. LOND., F.I.C.

(*National Institute for Medical Research*)

THE following method takes only a few seconds, needs only a drop of blood and no special apparatus, is very economical with reagents, and gives results accurate enough for clinical use. It is hoped it may prove useful in circumstances where more elaborate methods are impossible.

IN BLOOD

Method.—10 c.mm. of blood is placed on a paraffin block or waxed slide, 10 c.mm. of precipitating fluid is then added and mixed in with a fine stirrer or the end of a flat-ground rod, keeping the drop compact. A piece of test paper about ⅛ in. square is slid along and applied carefully (e.g., with a needle) to the edge of the drop. The clear exudate is soaked up by the paper and the yellow colour produced is compared, while the paper is still wet, with a series of standard papers. The comparison must be made quickly, for the test paper becomes yellow on drying even in the absence of sulphanilamide. Up to a strength of 10 mg. per 100 c.cm. results correct to 1 mg. can be obtained. Above this strength the colour differences are less well marked and dilution is advised.

Volumes.—It is preferable to use capillary pipettes accurately calibrated (Wright and Colebrook 1921), but arbitrary volumes may be used provided that two or more pipettes are calibrated with a drop of mercury to contain equal volumes. It is best to deliver to a calibration mark made at a small distance from the tip, to avoid difficulty in expelling the last trace of blood without bubbles, and to have the pipette tip waxed on the outside. If drops are used, one drop of blood may be taken as practically equal in volume to two drops of precipitating fluid from the same orifice.

Precipitating fluid.—This consists of 1 part of aqueous 50% *p*-toluenesulphonic acid, 3 parts of aqueous 20% phosphoric acid and 4 parts of alcohol. This gives a rapidly coagulating precipitate, and an exudate of the correct pH for the test, giving an even coloration to the test paper. It dries on the paper, giving a yellow coloration in about 3 minutes. If delay is unavoidable, drying may be delayed by using 1 part of glycerol and 3 parts of alcohol instead of the 4 parts of alcohol in the above formula. Another method, suggested by Dr. Bruce A. Anderson, is to cover the drop and test paper with a cover slip, whereby drying is delayed for many minutes. The fluid is mobile and is easier to deliver accurately if the pipette is drawn out at the end. Bloods vary in protein content and in the amount of oxalate or citrate added to them, and the large excess of phosphoric acid in the mixture is to allow for these variations. Phosphoric acid is a powerful buffer when used in this way, for considerable variations in its concentration do not seriously affect the pH.

Test papers.—These are prepared by pouring a mixture of equal parts of a freshly made 5% alcoholic solution of *p*-dimethylaminobenzaldehyde and pH 1.4 buffer on to Whatman No. 1 filter paper. The papers are dried, cut into strips and stored in a closed bottle or tube in the dark. They keep for a few weeks at least, but should not be exposed to sunlight and should be discarded when they become discoloured. The approximately pH 1.4 buffer is prepared from 10 c.cm. of N hydrochloric acid, and 10 c.cm. of 7% sodium chloride diluted to 250 c.cm. The buffer is included to stabilise the pH of the test still further, and to show up as yellow spots any amine which may be on the filter paper. The sulphanilamide from the drop gives an even coloration to the whole paper. A vivid yellow spot is due to a particle of sulphanilamide on the paper, while a stain at the edge farthest from the drop is due to drying. The dimethylaminobenzaldehyde should be almost colourless; most commercial samples are too yellow. Adams and Coleman (1922) give a method for obtaining a good product. An even simpler method is to warm a solution of the crude reagent in 6 parts of hydrochloric acid (1 of concentrated to 6 of water) with fullers' earth until most of the colour has gone, filter while hot, neutralise with caustic soda and filter off. It is hoped that good commercial samples of the reagent will be available.

Standard papers.—These are made by dipping Whatman No. 1 filter papers in the required concentrations of tartrazine, draining off the excess liquid, blotting well between blotting paper, drying and cutting into convenient sized pieces. The edge of the paper should be cut away because this stains darker than the rest. The table gives in the upper line the concentrations in mg. per 100 c.cm. of sulphanilamide in the blood which gives a colour which will match those of papers stained with a solution of tartrazine of the strengths shown in the lower line. If sulphapyridine or sulphadiazine is being estimated, these blood concentrations should be multiplied by 1.5, and for sulphathiazole 2.5.

A = Blood concentration (mg. per 100 c.cm.)
B = Strength of tartrazine solution (%)

A	1	2	3	4	5	6	7	8	9	10
B	0.010	0.021	0.031	0.042	0.052	0.062	0.073	0.083	0.094	0.104

It is convenient to make up a 0.52% solution of tartrazine (equivalent to 50 mg. per 100 c.cm. sulphanilamide) and to dilute 1, 2, 3 c.cm. &c. to 50 c.cm. to get the various standards. *Commercial samples of tartrazine differ in colour*, but Imperial Chemical Industries market a 'Tartrazine N.S. Biological Testing Quality,' which can be relied on for constancy of *properties. Strips* ¼ *in. wide can be mounted on a white card* with the ends projecting beyond the edge of the card so that they can be brought close to the test paper, but they get *dirty and have to be trimmed back occasionally*. The card can be covered in 'Cellophane' and the test papers moved over the top. Tartrazine is fast to light, but it is best to keep *the papers clean and in the dark when not in use*.

Dilution.—When the test shows a concentration of 10 mg. per 100 c.cm. or more it is advisable to repeat it at half strength. Thus 10 c.mm. of blood, 10 c.mm. of precipitating fluid and 20 c.mm. of diluting fluid (2 parts of 50% toluene sulphonic acid and 25 parts of alcohol made up to 100 with the pH 1.4 buffer) are well mixed, the test paper matched, and the result multiplied by 2. Mixing the drops can be done efficiently with the flat-ground end of a 2–3 mm. rod.

The chief difficulty is in comparing the wet test paper with the dry standard paper; a hand lens makes the comparison easier. Incorporation of a blue dye into the test was not found to help colour comparison. Possibly a suitable commercial grey or blue tinted paper could be found from which both test and standard paper could be made. A violet or blue filter may help in comparing the colours, particularly with values over 10 mg. per 100 c.cm., or in artificial light. For example, when viewed through a 1 mm. thickness of a 0.1%

days He was able to lead a normal quiet life but attempted no work as he did not feel capable of muscular exertion He had no gastrointestinal disturbance, headaches or dizziness, and his weight remained steady There was still much pigmentation of skin and mucous membrane and bilateral costolumbar tenderness His blood-pressure was 94/76 mm Hg and serum sodium 359 mg per 100 c cm On April 11, 1941, he began trial treatment with doca in propylene glycol 5 drops t d.s (10 mg daily), and was kept on a normal diet with his usual amount of supplementary salt mixture During the first week of treatment he was kept in bed At the end of the week he felt just as well as when at home, had no complaint of sickness or diarrhœa and his blood-pressure was 100/68 mm Hg On the 18th he was instructed to walk about as much as he did at home and next day he reported that he was very well , blood pressure 98/70 mm Hg On the 20th he complained of sore throat , temperature 101° F He was given 1 g of sulphanilamide by mouth During the day he vomited three times and next morning his temperature was 102 4° F , his throat was inflamed and the dose of sulphanilamide was repeated Throughout the day, despite 4-hourly doses of 0 5 g of sulphanilamide there was little change in his condition and his temperature remained unaltered By 7 15 P M he was exhausted and his blood-pressure had fallen to 55/40 mm Hg A crisis was clearly imminent and sublingual therapy was stopped Despite energetic treatment with cortical extract and intravenous infusions of 10% glucose in 5% saline he did not improve, and at 7 P M the next evening he fell into coma and died 3 hours later without regaining consciousness

CASE 3 —A housewife of 37 had continued treatment with 10 mg doca weekly since Oct 4, 1941, on a normal diet without supplementary salt , when extra salt was given she developed massive œdema She felt very well, but occasionally was unsteady in her gait There was slight œdema in her lower eyelids and her blood pressure was 118/76 mm Hg Her serum sodium was 335 mg per 100 c cm., serum chlorides [illegible] mg per 100 c cm and plasma potassium 18 mg per 100 c cm On Oct 15 she began treatment on normal diet with the usual supplementary salt mixture 15 g daily and doca in propylene glycol 5 drops t d.s (10 mg daily) During the next 5 days she was able to continue with her housework and felt quite normal, but on Nov. 20 she fainted while doing some housework, and though she recovered she had frequent attacks of dizziness throughout the next day On Nov 22 she continued to perform light duties but felt very weak and unsteady on her legs and did not feel confident about going out into the street alone She had no gastrointestinal disturbances and there was no œdema , blood-pressure 126/72 mm Hg, serum sodium 345 7 mg per 100 c cm , chlorides 702 mg per 100 c cm and plasma potassium 20 75 mg per 100 c cm She was persuaded to continue treatment and to restrict her activities On Nov 29 she had precordial pain and repeated attacks of fainting Her asthenia had greatly increased and she had been unable to do any housework, or even to walk upstairs There was no œdema in the face, abdomen or ankles Pigmentation had become darker in the flexor joint surfaces of the fingers and on the back of her neck. Her blood-pressure was 124/72 mg Hg , a radiogram of the chest showed no cardiac enlargement , 3 days later she arrived by ambulance at the out-patient department feeling sick and faint Since Nov [illegible] she had been unable to walk and had fainted many times ; she had not even had the strength to take a bath. There was no œdema, the pigmentation was unaltered, and her blood-pressure was still 124/72 mm Hg During examination she was unable to stand Her serum sodium was 367 5 mg , chlorides 640 mg and plasma potassium 25 7 mg per 100 c cm Sublingual therapy was stopped and she was given immediately 10 c cm of 'Eucortone' (A&H) and 5 mg of doca intramuscularly There was considerable improvement 2 days later She had had no further fainting attacks and though she was still slightly dyspnœic on walking she could do light duties She was put on treatment with doca, 5 mg twice weekly and reported in a week that she was able to do all her household duties without symptoms

CASE 4 —A typist of 33 had been maintained since July 15, 19[illegible], on a normal diet with no supplementary salt and with doca 5 mg intramuscularly three times a week. Apart from occasional indigestion she had no gastrointestinal disturbances Pigmentation was well marked with several localised patches of darker pigment on the left side of her face Though she did not feel very strong, she was able to do light duties in the house and normally rested in bed during the morning Costolumbar tenderness was present on the right side and her blood-pressure was 110/70 mm Hg On April 11, 1941, she began treatment on a normal diet with no supplementary salt and with doca in propylene glycol 5 drops t d.s (10 mg daily) After 3 days she complained of being very tired and listless though she was still able to walk about as usual , her blood-pressure had fallen to 108/62 mm Hg She experienced slight nausea after taking the drops, but was persuaded to continue On the 16th she was much brighter and said she felt as well as when she had doca by injection , her blood-pressure was 110/70 mm Hg Two days later, however, she again complained of being very tired, and was restless at night By this time she had no difficulty in taking the drops On the 23rd the onset of nausea and indigestion was accompanied by increased asthenia and she had to spend most of the day in bed , her blood-pressure was 106/70 mm Hg Three days later she was unable to walk about but there was no further increase in asthenia, and her blood pressure was 106/64 mg Hg On the 30th, though the nausea and indigestion persisted, there was no vomiting or diarrhœa, but she complained of increasing bouts of yawning and did not sleep well Her blood-pressure was 102/68 mm Hg, and she spent most of the time in bed Two days later, after 21 days' treatment, there was increased asthenia, pigmentation was unchanged and her blood-pressure was 102/64 mm Hg Treatment was stopped and she began her former parenteral treatment with doca On May 4 she was able to go downstairs and carry out light duties , her blood pressure had risen to 110/66 mm Hg

DISCUSSION

Sublingual therapy appears to be of limited value While all the patients expressed some difficulty in controlling the salivation which resulted from retaining the drops for 15 minutes beneath the tongue, they appeared to absorb sufficient hormone during the first 7–10 days of this treatment to satisfy their minimum requirements Thereafter the onset of adrenal insufficiency was observed in all cases Turnoff and Rowntree (1941) pointed out that œdema developed in both of their patients when salt and sublingual doca were given, but in the absence of extra salt no œdema resulted. It is interesting to note that case 3 developed massive œdema when extra salt was given and doca was administered intramuscularly, yet throughout her treatment with sublingual doca and extra salt there was no evidence of œdema This suggests that there was limited absorption of the hormone by the sublingual route

Despite the large daily dose of 10 mg employed, this mode of administration did not in this series produce the successful results reported by the American investigators This is supported by the conclusions of Simpson (1941) who found it to be of definite but limited value, and considers that from the practical point of view it is definitely inferior to treatment by inunction or injection, or by implantation of tablets , he states that his findings did not approach the most favourable of those published in America The cost of sublingual treatment is very much greater than that of treatment by injection

SUMMARY

Sublingual administration of desoxycorticosterone acetate dissolved in propylene glycol failed to maintain 4 patients with Addison's disease in health, and cannot be considered an effective form of replacement therapy From an economic or any other point of view this form of administration presents no advantages over the parenteral route

I wish to thank Prof E J Wayne, Prof A. E Barnes and Dr Robert Platt, physicians to the Sheffield Royal Infirmary, for permission to carry out this trial on patients under their care , and Messrs Organon Laboratories who kindly supplied doca in propylene glycol

REFERENCES

Anderson E , Haymaker W and Henderson E (1940) *J Amer med Ass* 115 2167

Kuizenga, M H Nelson J W and Cartland, G F (1940) *Amer J Physiol* 130, 295

Simpson S L (1941) Personal communication.

Turnoff, D and Rowntree, L. G (1941) *J Amer med Ass* 116, 2016

In January 100 cases of typhus were reported in Finland, compared with 83 in the previous month

The nictitating membrane was also found to be bacteriologically sterile

In order to obtain a murine strain of the virus, the usual procedure has been to remove the brain from a rabbit with herpes encephalitis and use this for intracerebral passage into mice Since encephalitis develops in only a certain percentage of inoculated rabbits and since this proportion may be small (e g, in Friedenwald's series only 12 of 58 inoculated rabbits developed encephalitic symptoms) it may take time before a suitable source of material for adaptation presents itself Black (1942) has reported successful induction of herpetic encephalitis in mice by inoculating them with the purulent exudate from a rabbit's eye, emulsified in normal saline In our hands this method was less reliable in producing encephalitis in mice than the method to be described This consists essentially in inoculating mice with emulsified nictitating membrane

Technique—When a positive herpetic reaction is well established in a rabbit's eye, usually 36–48 hours after inoculation, the animal is anæsthetised with ether The eyelids are separated, the free edge of the nictitating membrane is seized with sterile thumb forceps, and the membrane is cut off from its attachment with sterile scissors The triangular portion removed is washed by rinsing it in a petri dish of sterile physiological saline There is usually very little bleeding and none that cannot be stopped by slight pressure with a piece of absorbent cotton wool No further treatment of the rabbit is required The removed portion of the membrane is then ground with pestle and mortar using sterile alundum and sterile physiological saline (other suitable abrasives and diluents can probably be used) After centrifugation to remove coarse particles the supernatant is inoculated, in 0 025–0 03 c cm amounts, intracerebrally into mice Herpetic encephalitis results after a varying inoculation period which may be as long as 10 days on first passage but usually decreases to 3–4 days after brain to brain passage has been frequently repeated Culture of the emulsified material on blood agar plates is bacteriologically sterile except for occasional obviously adventitious contaminants

By using this method we were able to induce herpetic encephalitis in mice from 10 consecutive rabbits infected with different strains of herpes virus obtained from the saliva of human cases of primary herpetic stomatitis (Scott and Steigman 1941) Since the original 10 strains were isolated the procedure has been followed many times, in these experiments we have occasionally been unsuccessful in adapting rabbit strains to mice, but these failures have been rare

SUMMARY

A method for the rapid adaptation of human strains of herpes simplex virus from the rabbit eye to mouse brain is described The nictitating membrane from a herpes infected eye is removed with aseptic precautions, emulsified and inoculated intracerebrally into mice By this means herpetic encephalitis was produced in this host by 10 different human strains of the virus isolated on rabbit eyes

REFERENCES

Black, W C (1942) *J Pediat* 20 145
Friedenwald, J (1923) *Arch Ophthal* 52 105
Scott, T F McN and Steigman, A J (1941) *J Amer med Ass* 117, 999

NIGHT NURSERIES —Women workers in factories have long been appealing for nurseries where their children will be looked after while they are engaged in the country's business Day nurseries are slowly increasing in number, but up to a week or two ago no provision existed for the children of workers on night shift On May 29 the two first night-nurseries in the country were opened in the Midlands by Mr Ernest Brown, minister of health, and Mr Clifford Phelps Morehouse, of Wisconsin They are sponsored by the people of West Virginia, and are the first of a nation-wide series to be supported by the people of America Funds have been provided by the Save the Children Federation of the United States, the Ministry of Health has provided the cost of equipment, and the Council for Nursery Homes for the Children of War Workers, formed by the *News Chronicle*, has been responsible for organisation and management The council represents child welfare organisations and bodies interested in children's nurseries

---

SUBLINGUAL THERAPY IN ADDISON'S DISEASE

ANDREW WILSON, M B , PH D GLASG
LECTURER IN PHARMACOLOGY AND THERAPEUTICS IN THE UNIVERSIT
OF SHEFFIELD

THERE is ample evidence that desoxycorticosteron acetate, parenterally administered or by implantatio of pellets, is effective in the treatment of Addison' disease The main disadvantage of injection is it inconvenience, and of the latter the difficulty of controlling absorption Experimental evidence by Kuizenga Nelson and Cartland (1940) and clinical reports b Anderson, Haymaker and Henderson (1940) have demonstrated that oral administration is without value Mo recently the sublingual method of absorption has bee attempted in America Good results were reported b Anderson, Haymaker and Henderson (1940) who wer able to maintain 6 patients with Addison's disease on daily dose varying from 2 to 6 mg of 'Doca' (organon) The period of treatment was 6–8 weeks, during which th patients were in excellent condition and able to carr on their usual occupations Later Turnoff and Rowntree (1941) described the successful treatment of 2 case of Addison's disease over a month They stated tha their patients gained weight and that the blood-pressur levels were maintained

In the series reported here, 4 patients with Addison' disease were studied They had all been previousl maintained in a satisfactory condition by doca given intramuscularly in doses of 10–20 mg per week At th beginning of the investigation they were put on a normal diet with the addition of extra salt, as indicated in the case-reports The solution used contained 10 mg of doca dissolved in 1 c cm of propylene-glycol This solution was issued to the patients in dropper bottles so that 15 drops contained 10 mg doca The patients were instructed to place 5 drops under the tongue 3 times a day, an hour before food, to retain the drops for at least 15 minutes and then to expectorate or swallow

CASE-RECORDS

CASE 1 —An engineer of 35 had been successfully treated since Nov 1, 1940, with 5 mg doca 4 times a week with supplementary salt, 1 teaspoonful t d s On April 12, 1941, treatment with doca was stopped for 3 days, after which he complained of general weakness, being able to walk only about 200 yards before feeling breathless and weak in the legs Costolumbar tenderness was well marked in the right side On April 16 he began treatment with doca in propylene glycol and was instructed to take 5 drops t d s (10 mg daily) and to continue his supplementary salt Next day he felt stronger in the legs and in 3 days though his blood pressure had fallen from 116/78 to 112/70 mm Hg he reported general improvement After a week of treatment he was no worse and had had no sickness, but his blood pressure was 108/70 mm Hg At the end of the second week he complained of lack of energy, pain in the joints and headache He had had one attack of abdominal pain, no vomiting or diarrhœa, blood pressure 108/60 mm Hg After 16 days of treatment he reported numerous attacks of abdominal pain and fairly constant nausea; his appetite had diminished He was as tired as he had been on April 16 Because of the weakness he had felt it an effort to move about, when he did so he felt his heart thumping Next day he had an acute attack of epigastric pain accompanied by diarrhœa, he often stumbled and was able to walk only a short distance, during which he felt dizzy and dragged his left foot Blood pressure 102/70 mm Hg By April 19 there was evidence of impending crisis, he had lost 5½ lb in weight, his serum sodium was 280 mg per 100 c cm, plasma potassium 23 mg per 100 c cm, blood pressure 96/70 mm Hg Treatment was stopped, and he was given 10 mg of doca intramuscularly at once After 3 daily injections of 10 mg doca he was considerably improved and his blood pressure rose to 110/72 mm Hg Thereafter satisfactory treatment was continued with 5 mg of doca 4 times a week Within 10 days he was able to walk about as well as he did in September and his blood pressure was 116/80 mm Hg

CASE 2 —A farmer of 32 had been successfully treated since December, 1940, on a normal diet with supplementary salt mixture 15 g daily and 10 mg doca intramuscularly every 4

THE LANCET

LONDON SATURDAY JUNE 27 1942

CONSIDERATE TONSILLECTOMY

HAPPILY the custom of snatching ’ tonsils in the patient department is dying out Opinion is nging on the indications for tonsillectomy, and re is an undoubted trend towards conservatism echnique is changing and the older method is in ny places suspected of being rather crude But management of the children undergoing this ration is still not always as good as it might be The scenes and sounds of tonsil morning in some pitals would better become the pre-anæsthetic era of surgery than an age which possesses the means be humane Although the child is not really going to be hurt (as we assure ourselves and him) he is en having his confidence in his seniors severely sometimes irreparably shaken No doubt for ny children this is not a desperate matter ‘ They over it,” we say brightly, but they may not get er it very easily Suspicion and distrust are mmon after tonsillectomy, as those conducting outpatient departments know, and a few children develop nocturnal enuresis and even night terrors GERRIE and MACKENZIE (p 759) describe how they have successfully overcome the problem The out-patient operation is an archaic survival in modern surgical technique The need for haste has been allowed to override more important considerations, d it is significant that where the guillotine and hyl chloride procedure is regarded as adequate ven if not good practice it is usually, though not variably, accompanied by the handling GERRIE nd MACKENZIE criticise Where dissection is adopted more refined management is usual These are controversial statements, but their general truth is isputable

In the best type of ear nose and throat practice private cases have for long received the kindness and gentleness which should be inseparable from surgery in children, and in such practice similar care is given to the hospital case up to the limits possible in the particular hospital concerned It should surely be obvious that the child should be in hospital on the evening before the operation that a good night's rest should be provided by both comfortable surroundings and drugs, that some form of pre-operative medication should be given unless the anæsthetist can guarantee, as some can if they be not rushed that there will be no ‘ scene ’, that post-operative supervision should be adequate and skilled, and that the child should be kept in hospital until fit to return home without undue hazard of complications (it is permissible to risk the chance of a small secondary hæmorrhage 7–10 days later) There is still difference of opinion about the most satisfactory preoperative drug to use GERRIE and MACKENZIE recommend pentobarbital soluble (‘Nembutal’) Others use syrup of chloral paraldehyde (by mouth or rectum) compound tincture of camphor or ‘Nepenthe’ There are many correct answers the regular use of any one drug leads to greater success with and confidence in that drug The essential point is that a dose can be given which is safe in routine use while producing the requisite narcosis and amnesia Every drug has some special property either in administration or action which will endear it to a particular surgeon or anæsthetist This together with other circumstances such as cost govern the choice

It may be asserted that hospital accommodation and facilities are lacking for longer inpatient care of these children If so, they must be provided if necessary the public purse must be opened In this war anything agreed to be in the national interest is provided without raising the question of cost Humanity in dealing with the nation's children must surely be in the national interest

THE PLAN AND THE PLANNERS

THE plan is on the table and when we look at it[1] closely we shall find that its outlines are strangely familiar In 1920 Dr ADDISON, who the year before had become first Minister of Health invited his consultative council to submit proposals for the systematised provision of such forms of medical and allied services as should in their opinion be available for the inhabitants of a given area The scheme, which came to be known as the Dawson report was based on health centres primary and secondary, in which were to be brought together the various medical services, preventive and curative so as to form one organisation On the primary centre would be based the domiciliary services rendered by general practitioners with the aid of visiting consultants and specialists The secondary health centres in larger towns would have as their nucleus existing hospitals, both voluntary and poor-law institutions transferred from the guardians to the health authority Consulting services would be rendered at these centres by the hospital staffs on a part-time salary for scheduled duties with extra fees for special work Its central aim as we noted at the time[2] was to unify our profession and to set a standard which freedom of thought and action alone can give The historian has not yet made up his mind why this plan of 22 years ago remained on the table[3] But certain it is that the war has brought the realisation of its modern counterpart within our grasp And it is not so much the plan as the planners who have matured Two of them have signed both reports But the present plan is no longer a prophetic vision We look around with astonishment and see the initiative and spirit of adventure among those who have been the happiest and most successful under the old regime The torch has passed from the hands of dreamers to men and women like ourselves and the idealists have slipped almost unobserved into pragmatism What has happened is that the sense of security in the accepted manner of doing things has gone and at this moment the profession would welcome any change in the form of practice appropriate to the new era And the present plan has drawn in even those impatient souls who had despaired of an orderly system at the hands of their fellows and were looking to a plan imposed from outside The new offensive has captured them

Reorganisation of the hospital system is not to wait on the reform of local government areas which, although certain, will require prolonged study and

---

[1] *Brit med J* June 20 p 743 [2] *Lancet*, 1920 i 1176
[3] A possible clue will be found on p 771

Reviews of Books

Principles and Practice of Cardiology

CRIGHTON BRAMWELL, M D Manc , F R C P , professor of systematic medicine in the University of Manchester, physician to the Manchester Royal Infirmary , and JOHN T KING, M D Johns Hopkins, F A C P , associate professor of medicine in the Johns Hopkins University, visiting physician to the Johns Hopkins Hospital London Humphrey Milford, Oxford University Press Pp 509 35*s*

AMERICAN work now takes a leading part in cardiology, and a textbook on the subject written jointly by a British and an American physician is particularly welcome Professor Bramwell in the first half of the book deals with the signs and symptoms, treatment and prognosis common to all types of heart disease, correlating physiological principles with a wealth of clinical experience , and Professor King, in the second half, describes the main ætiological varieties The slight overlapping is no disadvantage Both authors have an intimate style, and the views expressed are largely personal In the section on special cardiology there are inevitably statements with which other cardiologists will not agree King ascribes to tonsillar infection a dominant rôle in the ætiology, not only of rheumatic heart disease but also of hypertension, coronary thrombosis in the younger age-groups and of exophthalmic goitre, supporting his contentions with statistics He also believes in acute cardiac dilatation, in pressure and volume changes in the left ventricle and aorta as a cause of pain, and considers that operations on the sympathetic nervous system for hypertension are wrong in principle The intravenous dose of strophanthin recommended for acute pulmonary œdema (0 001 g) is higher than that usually given in this country, and in the account of effort syndrome little stress is laid on the psychological factor The book is well produced with many illustrations Despite the number of excellent textbooks on cardiology, there is room for this one

Diseases of the Eye

(10th ed) Sir JOHN HERBERT PARSONS, M B Lond , F R C S , F R S , revised with the assistance of H B STALLARD M D Camb , F R C S London J and A Churchill Pp 726 25*s*

SINCE the last edition of this book there have been some important additions to our knowledge of eye disease and prophylaxis, which the new edition brings up to date It retains the size and general characteristics of its forerunners, and must now be one of the oldest established ophthalmological textbooks still on active service, for it originally came out in 1907 It is packed with all the essentials of eye work, and is a useful book of reference as well New matter includes sections on anæsthesia and nerve block for eye operations, modern operative technique—especially of cataract extraction, some information on vitamins and sulphonamides in ophthalmology, and more about detached retina The arguments for simple and combined cataract extraction are fairly stated in one of the best accounts in English at the present time, the only notable omission being the lack of any reference to dental sepsis Mustard gas burns of the eye are mentioned, and in view of the present importance of this subject illustrations would have been helpful The diagnosis and treatment of detached retina are well described, but it might have been emphasised that a person suffering from detachment of the superior half of the retina must be immobilised flat in bed at once Unless this is done the macula will detach, and if that once happens no operation can restore reading vision This thoroughly good book ends with an appendix on the visual requirements of the Services and an account of the muscle balance tests which a would-be RAF pilot must undergo

The Foot and Ankle

(2nd ed) PHILIP LEWIN, M D , F A C S London Henry Kimpton Pp 665 42*s*

IN his new edition Professor Lewin has given a full account of pathological conditions affecting the foot and ankle, and of diseases having any bearing on the feet Thus the book is an excellent general treatise on orthopædic practice Directions are given in detail for even such minor procedures as the practical fitting of shoes and the special care of ballet dancers' feet The chi addition has been made to the chapters on traumat surgery , he quotes freely from German, Frenc Spanish and British experience It is interesting to rea of the pitfalls of the Winnett-Orr method of occlusi wound treatment reported by French writers to who casualties in the Spanish Civil War found their way closed treatment of wounds and compound fractur requires more skill and equipment than many would hav us believe Chapters on the conservative treatment the paralysed child and on surgery of the vascular syste remind us of the many minor troubles which such diseas bring with them Dr Lewin's phraseology is descriptiv "A spastic child appears to be in a constant state stage fright " Various types of amputation are di cussed , Le Mesurier is quoted as recommending chan ing "below the knee" amputations into Gritti Stok amputations (which seems curious) but this is not D Lewin's own practice

Synopsis of Applied Pathological Chemistry

JEROME E ANDES, M S , Ph D , M D , F A C P , directo of department of health, and medical advisor, Universit of Arizona, Tucson , and A G EATON, B S , M A , Ph D assistant professor of physiology, Louisana State Universit New Orleans London Henry Kimpton Pp 427 20

THIS handy handbook should prove useful to th laboratory worker and the house-physician It is sma enough to be carried in the pocket for ready referenc and will also repay detailed and thorough readin Within the limitations imposed by its size, explanatio of chemical and physiological theory are clear and ade quate, and instructions concise and easily followed Th relations of chemical abnormalities to disease ar intelligently discussed , a table in each chapter sets ou the diseases in which abnormal chemical findings may b anticipated, and these tables should be particularl helpful to the houseman and student The methods o biochemical analysis given are for the most part trie procedures, to be found in any standard textbooks Innovations and recent developments have been rathe too scrupulously avoided None of the photo electr micro-analyses, for instance, have been included—a omission which seems scarcely justified in view of the widespread adoption in the last few years

The Municipal Year Book

London *Municipal Journal* Pp 1450 40*s*

THIS standard work moves with the times In th 1942 edition a clear section on housing surveys th procedure in regard to war-damaged houses, summaris ing the stages through which it has developed Th section on planning, building and reconstruction review the interim report of the Uthwatt committee and th reports submitted to the Minister of Works and Build ings by the Royal Institute of British Architects, bot of which bodies favour the creation of a central plannin authority to be responsible for national planning o townships after the war All outstanding development in local government are faithfully recorded and th sections giving lists of members of councils and chie officers (with their addresses and telephone numbers of all authorities in Great Britain and Ireland has bee brought up to date

Bell's Sale of Food and Drugs Second Supplement

(10th ed) London Butterworth and Co Pp 88 7*s* 6*d*

THE second supplement to this standard work brings it up to Jan 1, 1942, and supersedes the first supplement which now becomes obsolete Since the appearance of the tenth edition in 1939 over 70 emergency orders have been issued, all of which are dealt with and annotated in the supplement Except for the few who have made their own schedules of the orders as they appeared, this supplement is essential to all food inspectors who want to keep abreast of the times It only just fits into the pocket provided for it without straining the binding, but since few of the emergency orders will continue in force when the war is over, the more permanent supplement which will in time replace the second will probably be less bulky A completely new edition of Bell is unlikely to be needed for fifteen years or more, so the book, though expensive, has a long value if it is kept up to date with the supplements as they appear

THE LANCET

LONDON SATURDAY JUNE 27 1942

CONSIDERATE TONSILLECTOMY

HAPPILY the custom of "snatching" tonsils in the patient department is dying out Opinion is nging on the indications for tonsillectomy and re is an undoubted trend towards conservatism echnique is changing and the older method is in ny places suspected of being rather crude But management of the children undergoing this ration is still not always as good as it might be e scenes and sounds of 'tonsil morning" in some pitals would better become the pre-anæsthetic of surgery than an age which possesses the means be humane Although the child is not really going be hurt (as we assure ourselves and him) he is en having his confidence in his seniors severely sometimes irreparably shaken No doubt for ny children this is not a desperate matter "They over it,' we say brightly, but they may not get er it very easily Suspicion and distrust are mmon after tonsillectomy, as those conducting tpatient departments know and a few children develop nocturnal enuresis and even night terrors GERRIE and MACKENZIE (p 759) describe how they have successfully overcome the problem The outpatient operation is an archaic survival in modern gical technique The need for haste has been wed to override more important considerations, d it is significant that where the guillotine and yl chloride procedure is regarded as adequate en if not good practice it is usually though not variably, accompanied by the handling GERRIE nd MACKENZIE criticise Where dissection is adopted more refined management is usual These are ntroversial statements, but their general truth is sputable

In the best type of ear nose and throat practice private cases have for long received the kindness d gentleness which should be inseparable from surgery in children, and in such practice similar care given to the hospital case up to the limits possible the particular hospital concerned It should surely be, obvious that the child should be in hospital on the evening before the operation that a good night s rest should be provided by both comfortable surroundings and drugs, that some form of preoperative medication should be given unless the anæsthetist can guarantee, as some can if they be not rushed that there will be no 'scene that postoperative supervision should be adequate and skilled, and that the child should be kept in hospital until fit to return home without undue hazard of complications (it is permissible to risk the chance of a small secondary hæmorrhage 7–10 days later) There is still difference of opinion about the most satisfactory preoperative drug to use GERRIE and MACKENZIE recommend pentobarbital soluble ('Nembutal') Others use syrup of chloral, paraldehyde (by mouth or rectum) compound tincture of camphor or 'Nepenthe' There are many correct answers, the regular use of any one drug leads to greater success with and confidence in that drug The essential point is that a dose can be given which is safe in routine use while producing the requisite narcosis and amnesia Every drug has some special property either in administration or action which will endear it to a particular surgeon or anæsthetist This together with other circumstances such as cost govern the choice

It may be asserted that hospital accommodation and facilities are lacking for longer inpatient care of these children If so they must be provided, if necessary the public purse must be opened In this war anything agreed to be in the national interest is provided without raising the question of cost Humanity in dealing with the nation s children must surely be in the national interest

THE PLAN AND THE PLANNERS

THE plan is on the table and when we look at it[1] closely we shall find that its outlines are strangely familiar In 1920 Dr ADDISON, who the year before had become first Minister of Health, invited his consultative council to submit proposals for the systematised provision of such forms of medical and allied services as should in their opinion be available for the inhabitants of a given area The scheme, which came to be known as the Dawson report was based on health centres primary and secondary in which were to be brought together the various medical services preventive and curative so as to form one organisation On the primary centre would be based the domiciliary services rendered by general practitioners with the aid of visiting consultants and specialists The secondary health centres in larger towns would have as their nucleus existing hospitals both voluntary and poor-law institutions transferred from the guardians to the health authority Consulting services would be rendered at these centres by the hospital staffs on a part-time salary for scheduled duties with extra fees for special work Its central aim, as we noted at the time,[2] was to unify our profession and to set a standard which freedom of thought and action alone can give The historian has not yet made up his mind why this plan of 22 years ago remained on the table[3] But certain it is that the war has brought the realisation of its modern counterpart within our grasp And it is not so much the plan as the planners who have matured Two of them have signed both reports But the present plan is no longer a prophetic vision We look around with astonishment and see the initiative and spirit of adventure among those who have been the happiest and most successful under the old regime The torch has passed from the hands of dreamers to men and women like ourselves and the idealists have slipped almost unobserved into pragmatism What has happened is that the sense of security in the accepted manner of doing things has gone and at this moment the profession would welcome any change in the form of practice appropriate to the new era And the present plan has drawn in even those impatient souls who had despaired of an orderly system at the hands of their fellows and were looking to a plan imposed from outside The new offensive has captured them

Reorganisation of the hospital system is not to wait on the reform of local government areas which, although certain, will require prolonged study and adjustment before it can be embodied in legislation. The report envisages the establishment under statute of a regional hospitals council for each "natural hospital area." The phrase is a happy one because it expresses the essential rightness of the system that came into being as a war-time emergency. Voluntary and municipal hospitals seemed almost to slide of their own accord into place in a vast scheme of mobilisation and we are now glad to forget the labour pains in our delivery from the individualism of the past. There is no intention of interfering with the internal organisation of individual hospitals, but it is assumed that the general conditions in all the hospitals will ultimately be similar. Equally vital is acceptance of a uniform standard of consultant status, to be determined by a recognised central body of academic character. The three royal colleges in this country, and in Scotland the equivalent corporations, would obviously be well qualified to determine the nature of the requisite qualifications. When the war is over there will be released a considerable number of aspirants to consultant rank of proven initiative and resourcefulness whose service has prepared them to strengthen the weaker salients of a full hospital service. Those who intend to enter general practice after the war should look with cold clear eyes at § 62 of the report, which describes present conditions, and consider whether they would be content to start in life that way. The language of the paragraph is studiously moderate, but the job looks pitifully like the little retail shop which is one of the major tragedies of our time. Yet there are customers who go to one in preference to a branch of the chain stores. That is the reason why the whole new scheme is still based on the "family doctor" as the normal medical attendant and guardian. And at root the doctor-patient relationship, like matrimony, must depend on the mutual help and comfort that the one ought to have of the other—which is not biological or forensic but personal.

---

[1] *Brit med J* June 20 p 743   [2] *Lancet* 1920, i 1176

[3] A possible clue will be found on p 771

And now to turn to what is really the heart of the matter: the report could not have materialised even in this tentative form had there not been a slow but steady veering of the professional outlook from ill health towards positive health. It is still necessary if we are to be understood of both parties, citizen and doctor, to put the word "positive" before the word "health." Will it not be necessary if the doctor is to become the guardian of the family as well as its attendant in sickness to breed a new race of doctors or a new species of the genus? Will it not be necessary to educate a new generation of citizens into seeking guidance from the family doctor in matters of conduct? Can the dual functions of guide-philosopher-friend and authoritarian healer be combined in one person? If we can overcome the deterrent effect of time, distance and expense by providing "health centres" everywhere, can we eliminate the instinctive dislike of many citizens for all the "doctor" stands for? Can we as biologists hope to influence function by a designed structure, even if we provide the easy opportunity, has there been time for the clinics—antenatal, postnatal child welfare and so forth—to change reluctance into readiness on the part of the family to turn to the priest of health for an oracle on behaviour and action? It would be a slow development, but it would come. There may have been good reason in the past for thinking of the doctor as the antithesis of Tennyson's nature, so *careful* of the single life, so *careless* of the type he seems. But the community has given the new medicine its expensive tools and is not going to refuse us liberty to use them in the most effective way. It only needs to be satisfied that the craftsman has a single eye for his craft and confidence will come.

SURGERY IN THE DESERT

THERE have so far been regrettably few first-hand accounts of operating experiences in the front line of army warfare. Great as was our experience of the wounds of war during the air-raids, that was essentially operating de luxe, with organised theatres, blood-transfusion teams and specialist opinions available. But mobile war is a different story, and in the desert the difficulties are extreme; the days are hot and the nights bitterly cold, dust storms and rugged roads make the moving of wounded extremely difficult, and the ambulances can rarely travel at more than 3 to 4 miles an hour. Colonel JULIAN SMITH[1] of the Australian Army Medical Corps, tells of war surgery under such conditions in Libya in the December, 1940, campaign, and later in Syria. He was in charge of an advanced main dressing station and he urges that this should be reserved for the severely wounded, the rest being passed back to the casualty clearing stations. He insists that the severely wounded must not be allowed to travel for a few days after operation. His team at Tobruk he regards as having been particularly fortunate in securing an Italian operating tent with double sides, skylights and an aluminium floor. They also secured a 'Primus' burner autoclave, which he calls indispensable, as was also the small motor generator units for electric light for operating. The personnel of the team, carefully chosen, consisted of two surgeons, an assistant surgeon, two operating-room assistants, one anæsthetist orderly, and a batman. The last, he says, was not a luxury, for even the surgeon must eat. The orderlies assisted at operations and sterilised sutures and instruments (made up in linen bundle sets). The anæsthetist orderly and at one time the dentist of the field ambulances, gave the anæsthetics, the orderlies having received some previous instruction in anæsthesia in Palestine. Only 'Pentothal' or ether was used. Specialist anæsthetists he regards as 'misplaced and wasteful members" of such a team, but he pleads for the attachment of a full-time blood-transfusion officer, perhaps he does not realise the enormous part most anæsthetists these days play in pre- and post-operative resuscitation, and blood and plasma transfusions are being accepted as their responsibility.

Each surgeon had two operating tables and the assistant spent his time "teeing up" the cases; a formidable array of clothing had first to be removed during the cold nights. A third of all those operated on at Tobruk received transfusions of blood. This had been drawn off a few days before battle from minor walking wounded who had been injured by booby traps or stray shells. The blood was stored in an ice-box which had been specially carted along with them. As a rule wounds were excised, and SMITH urges the importance of the fascial layer should be split and incised against its fibres to secure adequate relaxation Late wounds not excised for this merely produced, in his , a larger suppurating wound He has great in the sulphonamides and says they have ged the picture of the wounds of war " He equal parts of sulphapyridine and sulphanil- locally and all wounded were given sulpha- dine by mouth, 2 g on admission followed by 1 g hourly he comments favourably on the practice some of his colleagues[2] in giving sulphapyridine one daily dose of 5 g Of 1500 battle casualties in not one developed gas gangrene after evacuation the base 7 arrived at the casualty clearing station established gas gangrene infection which always nded to appropriate surgical treatment He cates any form of gauze packing and says that plugs rather than drains All the wounds after sion and sulphonamide powder instillation had paraffin inserted as a blob,' and this was ered with several layers of gauze as a flat dressing compound fractures and large muscle wounds treated in plaster if this was at all feasible The pound humerus and especially the compound ur presented special problems Because of trans- difficulties an abduction type of shoulder spica impossible , anatomical perfection had to be garded and a plaster applied solely for im- lisation For the compound fractured femur opened the wound very widely and inserted large cle elevators to ensure full excision A Thomas t with strapping extension (in Syria, Kirschner) was used and by means of plaster this was rporated in the splint to secure more rigid im- bilisation but even this was not absolutely sfactory from the point of view of transport

---

[1] *Aust N Z J Surg* 1942 11, 153

operated on 19 abdominal wounds and 9 of men survived he points out that in nearly such wounds a large intra-abdominal vessel, in the ntery or otherwise has been injured and it is ng the vessel that infection rapidly spreads This ular damage also makes blood-transfusion speci- y necessary in these cases He advises the mid- incision, or a transverse incision if kidney damage suspected and he used linen thread both for tures and bowel repair In the thoraco-abdominal und he says the immediate problem is the abdo- al injury , the chest wound can well be left alone fact he strongly advocates conservatism in front- thoracic surgery During the Cyrenaican and an campaigns, out of 2500 battle casualties " not solitary operation was performed primarily to deal th injury of the intrathoracic structures " The n chest wound was sutured with silkworm gut at e regimental aid-post and foreign body removals re all delayed until the patient reached the base ital Aspiration was employed to relieve astinal shift or respiratory difficulty He quotes jor **Edgar King**, his colleague at the base who 63 cases of penetrating chest wounds, only 3 of hich developed empyemas

It is instructive to note that, in front-line desert ery at any rate, Colonel **Smith** found no m for the pure surgical specialist, the idea a ' gypsy " surgeon roaming from hospital to pital to do special work he scouts as absurd Certainly many a neurosurgeon or orthopædic surgeon in this war has had to operate on the abdominal wound, and the British Postgraduate Medical School is meeting the demands for this general surgical education in a series of well-planned courses But there must be more frequent courses, perhaps several at a time, if the needs of all are to be met , and time is short It is worth while, for **Smith** has satisfied himself that the surgeon who has passed successfully through the mill of emergency surgery at a general hospital can face with equanimity the wounds of war And for his own peace of mind the anæsthetist who is likely to accompany him should familiarise himself now with the whole technique of blood and serum transport and of transfusion

FRIENDLY ACTION OF CHARCOAL

The menace of gas warfare has again reminded us that charcoal possesses the convenient power of picking up poisons and leaving the respirable gases The same applies in liquids—thus, drinking-water can be freed from objectionable tastes by filtration through charcoal beds, and in cases of alkaloidal poisoning the physician administers charcoal with the confidence of a gamekeeper releasing a ferret in a rabbit warren Again in industry, where charcoal is now used in vast quantities, its benevolent selectivity operates, and it emerges from a useless welter of material with valuable products which it will yield up at the bidding of the chemist But what **Goethe** would have called its ' elective affinity ' depends on chemical and physical laws[1] (many of them obscure) and not on mere friendliness to man

Such is its sponginess that charcoal presents an enormous internal surface area One cubic inch is said to possess 20,000 square yards of adsorbing surface Thus even though the adsorbed substance is spread out thinly a great deal can be stored in a small bulk of charcoal Gases and vapours are held on the charcoal by three separate mechanisms first, by chemical forces (chemisorption), a form of chemical combination which may be very powerful , secondly, by Van der Waal s forces (adsorption proper), the same physical forces as those which enable a gas to be liquefied , and thirdly, by capillary condensation The first two lay down layers of the sorbed material one molecule thick on the surface of the charcoal while the third merely fills up the pores when the charcoal is submitted to high pressures of a gas All gases and all vapours are adsorbed to varying degrees Selection depends largely on chemisorption, and for this reason chemicals which are most unsaturated or have the greatest polarity are preferred Thus compounds with double bonds are usually taken up first, followed in order by organic compounds containing sulphur, nitrogen and oxygen Ordinary stable substances, such as the permanent gases, are adsorbed by the physical process , this mechanism is reversible, so that the gases can be removed under reduced pressure, while chemisorption is often irreversible Understanding of chemisorption has been complicated by the process of activation, introduced in the last war when gas-masks first became an urgent necessity In this process the charcoal is submitted to high temperatures in an atmosphere of air or steam , this increases porosity by burning off adherent hydrocarbons but also lays down on the surface of the charcoal a monomolecular layer of chemically bound oxygen, so that adsorption by activated charcoal is in effect adsorption by a thin layer of a combination of carbon and oxygen This process enormously increases the efficiency of the charcoal as an adsorbent, so that for certain purposes an activated charcoal may be 200 times as efficient as the old wood and animal charcoals Moreover the process can be varied so as to produce a charcoal with special properties—a charcoal activated in oxygen at 440° C , for instance, is an excellent adsorbent for bases from solution but only a moderate one for acids, whereas 850° C will produce a charcoal which adsorbs acids but totally excludes bases There is a close parallel between our olfactory mechanism and that of charcoal Both show the same preference for large and unsaturated molecules—it is the unsaturated members of the aliphatic series which are the smelly ones—and both have an additional physical mechanism which acts on the permanent gases such as chlorine For chlorine " smells " more by stimulating the endings of the fifth nerve than those of the first There are some exceptions—for instance, hydrocyanic acid is poorly adsorbed on charcoal—but broadly this parallel accounts for the almost childlike affinity of charcoal for smelly things

---

[2] See Andrew R *Med J Aust* 1941, ii, 612

[1] See Adam N K Physics and Chemistry of Surfaces London chap 7 Reilly J and Rae W N Physio-Chemical Methods, London Vol II 1933

While charcoal has in the past decade risen steadily in the esteem of industrial chemists it has fallen into disrepute in therapeutics, and it is no longer official in the BP The older clinicians gave charcoal freely in tympanites and for cases of intestinal fistula with offensive fæcal discharge, and were convinced that it helped to remove odours But sceptics alleged that charcoal in the moist state is inactive as an adsorbent of gases, so that it must be useless for this purpose in the gut In fact charcoal acts as well though slower in water as in air, in contrast to other adsorbents such as silica gel which will take up water before anything else Immersion of our gas-masks is unwise not because it will render the charcoal ineffective but because wet charcoal will seriously embarrass breathing, and water will put the wadding screen against arsenical smokes out of action MUTCH[2] has demonstrated how samples of charcoal vary in adsorptive power, so that until standardisation becomes satisfactory poor samples may still give charcoal a bad name In THE LANCET of June 6 (p 669) Dr STANLEY ALSTEAD described a new technique for using the deodorant properties of charcoal He has shown that a " blanket " made by incorporating a layer of charcoal grit between two layers of coarse cotton-wool will almost entirely prevent smells from inside a bed reaching the outside air He suggests the application of the method to cases of inoperable cancer of the uterus and the like, in the final stages of which the smell of discharges may be unbearably distressing to visitors and attendants , and these patients are often nursed at home The same principle has been adapted to checking the smell of wounds treated by the closed plaster method On another page Prof SEDDON and Prof FLOREY describe the construction of deodorising bags in which the plastered limb is enclosed They are made of cloth treated with carbon dust, now supplied to EMS and military hospitals by the Ministry of Health, and have been favourably reported on by 24 hospitals which have tried them since their introduction in an EMS memo[3] a year ago , thus one of the main disadvantages of the closed plaster treatment of wounds has been removed

Annotations

PINCER MOVEMENT AGAINST CANCER

BUT for the war the Cancer Act, passed in 1939, would now be in full operation Under it local authorities are to be responsible for providing diagnostic facilities, adequate treatment by surgery and radiotherapy a follow-up scheme and public education Lately the Minister of Health has advised local authorities to consider the schemes they intend to put forward after the war, and meanwhile to present interim instalments for approval as soon as possible This is a good move for cancer patients suffered badly through dispersal of population and of radium at the beginning of the war, and these interim plans will help to make up leeway The National Radium Commission, which is well placed to judge the needs of cancer patients, has approved a memo setting out an ideal organisation for their treatment The regionalisation of the medical services of the country is accepted in the memo as probable, and the plan is drawn up to fit into that pattern Despite a steady increase in the survival rate of cancer patients the death-rate continues to rise—a paradox due, the Commission believe, to late diagnosis, lack of beds for cancer treatment, failure to select the best treatment for each case, and inefficient treatment in centres which are poorly equipped They consider that under the new scheme the executive in each region should be in the hands of a cancer committee which would make sure that equipment and accommodation in all the hospitals treating cancer were sufficient, appoint members of the cancer team, take charge of finance and encourage research They advise the appointment of a whole time director fully experienced in cancer work The area served by any single cancer organisation should be such that about 1000 cases are treated yearly, this implying service to a population of about a million , not less than 75 beds will be needed With the amount of experience such an area would afford, each member of the team would become expert, the X ray apparatus and radium would be used to capacity, and the statistics collected would be significant The team would include physicians, surgeons, ENT surgeons, gynæcologists, radiotherapists, pathologists, radiodiagnosticians and physicists, who would meet freely in consultation Not all these, of course, would give up all their time to cancer work, though the last three would probably hold full time appointments The organisation would have departments in one or more large general hospitals in the region, one of which would house the headquarters Diagnostic centres might be established at several other hospitals in the region, to ensure that cases came early into the hands of the team For every case treatment would be planned between team members, and carried out by one , later there would be further consultations on the case, so that all members of the team would become aware of the advantages and limitations of different methods Radiotherapy will have to be concentrated in one or two hospitals, and the radiotherapist should be in full charge, the commission feel, of all radium and X-ray therapy, He should have at his disposal at least 1 g of radium, so that every case may be treated with the most appropriate container~ Two deep X-ray therapy sets will be needed, that if one breaks down treatment need not be pted~ The physicist will help in planning radium liances and estimating dosage Follow up and records in time give valuable information case papers for cancer patients should be uniform throughout the try, and so should statistical analysis cards An k on cancer conceived on this broad plan should in give us mastery over a disease which has so far had s largely its own way

---

[2] Mutch, N *Brit med J* 1934 i, 320

[3] Emergency Medical Services Instructions, part 1 Medical Treatment and Special Centres 1941

RESEARCH ON WOUND TREATMENT

In spite of the vast number of wounds and burns ch are treated every year, even in peace time, there remarkably little agreement about how to treat them last war stimulated the development of the Carrel-n method, but as F L Meleney[1] pointed out in a es of lectures delivered during April, 1941, this form treatment has gradually been dropped Meleney es a long list of known facts concerning injuries and this basis goes on to propose an organised research a series of 2000 cases of civilian casualties His n was the recognition that the United States was imminent danger of being involved in the present and his desire to get some sort of routine worked before the profession was confronted with large bers of casualties The plan envisaged a unit of beds in well equipped hospitals in each of 10 large s, with a director of each unit and a group of eons and full laboratory facilities available for the plete investigation of each case After suitable cal treatment of the wounds, including the taking specimens for culture, the cases would be treated in tion according to the following table

Closed wounds, without sulphonamide by mouth
  (a) Nothing locally
  (b) Sulphonamide locally
  (c) Radiotherapy
Closed wounds, with sulphonamide by mouth
  (a) Nothing locally
  (b) Sulphonamide locally
Open wounds without sulphonamide by mouth
  (a) Nothing locally
  (b) Sulphonamide locally
  (c) Radiotherapy
  (d) Zinc peroxide locally
Open wounds with sulphonamide by mouth
  (a) Nothing locally
  (b) Sulphonamide locally
  (c) Zinc peroxide locally

Burned patients, after surgical treatment and culture, ould be divided into two groups, one with and the other thout sulphonamides by mouth or injection Each up would then be subdivided into those locally treated clusively with 5% tannic acid and silver nitrate, and ose having the same treatment for body burns but quent wet dressings of 1% sodium chloride and 0 25% um citrate over tullegras for burns of face and hands s scheme would be open to modification if there were bvious indications for it It was estimated that the udy would cost about a third of a million dollars, but eleney remarks that this represents the amount of y life insurance on only 35 soldiers He did not lieve that the scheme could be operated in any bellint country, but our own EMS could work something ke it during the "quiet times" of war The results ight be of immense value

ANÆMIA IN X-RAY WORKERS

Many people working in X ray departments of EMS spitals have been taken off work because they had or degrees of anæmia which were ascribed to the cts of the X rays In a letter to hospital officers Prof R Fraser says this action is unnecessary Periodic d examinations of X ray workers carried out in many titutions over long periods have not revealed a single case of aplastic anæmia, and there seems to be no published record of aplastic anæmia developing in any X ray worker who was not also in contact with radium The few cases of ordinary secondary anæmia found appear to result from the conditions of employment rather than any specific action of the rays There have been rare examples of serious reduction in the white cell count, but the worker has recovered after a short absence from work One girl radiographer at King's College Hospital, however, developed a severe leucopenia for the second time on returning to the X-ray department and was advised to find some other occupation Periodic blood examinations at intervals of 6–12 months are advisable for detecting hæmoglobin and red cell deficiencies such as may arise in any people working in unfavourable surroundings for discovering the exceptional X-ray worker who develops serious white cell deficiency, and is a reassurance to radiographers in general It is also reasonable to examine the blood of all candidates for employment in an X ray department before they start work Minor degrees of anæmia need not be treated more seriously among radiographers than in other occupations and the term "X ray anæmia" having no particular meaning, should be avoided Minor degrees of leucopenia should suggest a further examination perhaps a fortnight later, and if the leucopenia is then confirmed or found to be progressive the worker should be suspended from X-ray work until the blood state is re established and the white cell count remains constant

INTRAMEDULLARY TRANSFUSION

It is not always easy to find a vein for intravenous infusion, if the infusion is lengthy the needle or cannula may gradually become occluded, and repeated infusions may steadily reduce the number of suitable veins Many special methods have been devised to overcome these difficulties, Tocantins and his colleagues,[1] viewing the vascularity of the sternal marrow and noting how easy sternal puncture is, suggested that the bone-marrow offered a practical alternative route for the rapid infusion of blood and other fluids By injection experiments they showed that material passes by way of the internal mammary veins and rapidly reaches the right auricle and so the general circulation A series of favourable results were reported and later[2] they showed that the method could be adapted for children from birth up to 3 years old by inserting the puncture needle into the upper end of the tibia instead of into the sternum, which at this age has not a sufficiently large marrow space In children they found that poor results were obtained in cases of "congenital anæmia and erythroblastosis" and they attributed this failure to undue fibrosis of the marrow They use a special needle with an inner sheath and stylet to prevent blockage of the needle by marrow material Papper and Rovenstine[3] have recently reported satisfactory results with intrasternal infusion, but did not find it necessary to use the special double needle, they used an ordinary stout needle with a properly fitting stylet and had two sizes available The technique is simple under local anæsthesia the needle is inserted over the lower end of the manubrium sterni, and when the bone is struck the needle is directed towards the patient's head at an angle of 30 degrees to the surface of the bone and bored in with a semi-rotatory motion The infusion apparatus is made ready beforehand and the reservoir needs to be 3½ ft above the patient's chest When the marrow cavity is entered, the stylet is withdrawn and a little marrow fluid sucked out with a dry syringe in order to confirm the correct position of the needle, and to obtain some marrow for examination The needle is rapidly washed out with saline and the infusion apparatus connected up , the transfusion then proceeds without further attention Rates of flow have varied from 150 to 600 c cm per hour and can be adjusted between these limits It is important to maintain the head of pressure, since if any marrow rises into the rubber tubing it will certainly clot The needle tends to become blocked after 6–12 hours , it can easily be cleaned out while in position by using the stylet and washing out with a little sterile saline under slight pressure Once inserted, the needle remains firmly in place and no retaining strapping is required , the patient can be allowed some movement The infusions can presumably be repeated, but further information is needed on this point It is claimed that the needle can remain in place for many hours without causing discomfort The method has obvious application to the patient who needs multiple blood-transfusions and to the shocked patient, especially if obese, in whom veins are difficult to find It has a clear application in military and civilian emergency surgery when the medical officer may find himself faced at short notice with several shocked patients all needing infusions of plasma or blood One difficult venesection can take up a lot of time and an alternative method is worth exploration If the American experience with intramedullary infusion is confirmed, the simple apparatus could be distributed where it will do most good

---

[1] *Ann Surg* 1941, 114, 283

[1] Tocantins L M O'Neill J F and Rice, A H *Ann Surg* 1941 114 1085

[2] Tocantins L M, O'Neill, J F and Jones, H W *J Amer med Ass* 1941 117, 1229

[3] Papper, E M and Rovenstine E A *War Med* 1942, 2 277

TETANUS AFTER LOCAL CHEMOTHERAPY

THE death of a woman from tetanus which seems likely to have come from a carton containing sulphapyridine powder should remind surgeons that sulphonamide powders must be sterilised before being locally applied to a wound, inserted into the peritoneum or given intravenously The woman was operated on for a pyosalpinx in a London hospital on April 13, there was widespread pelvic infection and sulphapyridine powder was therefore sprinkled on the operation area in the pelvis before closure of the abdomen, a rubber drain being left in The woman recovered satisfactorily until April 20, when she complained of stiffness of the jaw Within a few hours she could not open her mouth, tetanus was diagnosed and 280,000 units of antitetanic serum given, but she died next day *Bacillus tetani* was recovered from the operation site in the pelvis at autopsy , no organisms were grown from the catgut used In this case the sulphapyridine was poured from a cardboard carton into a sterile glass container and handed to the surgeon Bacteriological examination of the carton revealed living bacteria which resembled *B tetani* in many respects but have so far failed to show the toxigenic properties of that organism Nevertheless, the coroner[1] accepted the presumptive evidence that the infection came from the container and returned a verdict to that effect In these days of paper salvage cardboard may come from highly contaminated sources, and examination of sulphapyridine containers has in fact shown the presence of various sporing organisms including *Clostridium welchii* There has been no evidence that the sulphonamide is itself infected The lesson of this case is definite, though the bacteriologists have not traced the source of infection with certainty Cardboard, even if it can be sterilised without spoiling it for box-making, which seems uncertain, should be replaced by glass or metal for making containers for sulphonamide powders Preliminary experiments have demonstrated that a sulphonamide powder in a cardboard or glass screw capped container can be effectively sterilised by moist heat under 20 lb pressure for 20 minutes, and neither sulphanilamide nor sulphapyridine appears to be changed by this treatment , sulphathiazole powder, on the other hand, cakes At the inquest a representative of the manufacturers pointed out that overheating might render sulphapyridine both useless and poisonous, so that it is doubtful whether sterilisation should be left to each hospital to carry out for itself , it is surely up to the manufacturers to supply a sterile product in a container which will be as easy to sterilise as a tube of catgut, and the Ministry of Supply should see there is no delay through lack of materials

ELECTROENCEPHALOGRAM AND FLYING ABILITY

RECOGNISABLE differences between the electro-encephalogram of normal people and of those wi personality disorders have been demonstrated repeated and it has been accepted that in an apparently norm subject an abnormal electroencephalogram indicat that its possessor is carrying an unrecognised biophysi defect which may show itself in some behaviour disord in him or his offspring[1] The nature of the behavio disorder will be determined by many other factors, so environmental and others inborn At the Roy Society of Medicine, Denis Hill and J Watterson show recently that people with aggressive traits in th personality are more likely to have abnormalities in t EEG than normal people Williams[1] has demonstrat that not only is epilepsy associated with a high abn mality rate in the EEG but constitutionally determin psychoneuroses are frequently associated with chang in the EEG, which presumably reflects an inborn disord of cerebral function It is not surprising therefore th people have turned to the EEG for help in the diffic problem of vocational selection, particularly in relati to flying The obviously unsuitable candidates wi intellectual deficiency or disorders of affect can read be weeded out by adequate personality selection B less evident deficiencies, which may only become appare under stress, are liable to go by unnoticed The ide of vocational selection is the recognition of the eminent suitable personality, rather than the rejection of t obviously unsuitable, but here the psychiatrist is fac with an almost impossible task As Birley[2] said aft the last war, speaking of aircrew selection, it is diffic to imagine two more widely different personalities th those of Ranjitsinhji and W G Grace, yet both follow the same highly selected vocation with consumma skill The preselection of the expert aviator is as diffic as the recognition of the potential athlete Thorne Gibbs and Gibbs[3] have shown that information on t likelihood that a man will make a good pilot can obtained from the electroencephalogram Even wh those with abnormal records are rejected there is st a relationship between characteristics of the norm EEG and the man's ability to learn to fly They record the distribution of energy in the frequency spectru and the amount of change seen in this spectrum as result of overbreathing in 109 aviators, half of who were military student pilots and the other half experience pilots in the United States Army The closer th dominant rhythm was to 10½ a second the more like was the man to succeed as a pupil pilot Their resul are similar to those obtained by Gallagher and Gibbs in boys between 14 and 15 years of age, for here th incidence of "nervous" or "queer" boys was highe among those with a dominant frequency below 9 an above 10½ a second Unfortunately there is a good de of overlapping between the groups so that rejection the unsuitable carries with it removal of many suitab candidates, not always advisable in time of war , whi even were this desirable, some unsuitable candidate would be accepted There is, then, no immediat prospect that electroencephalography will become pa of the routine examination for flying training, but th day when objective criteria will be used in place o subjective impressions seems to be a little closer

---

[1] The inquest is briefly reported in the *Pharmaceutical Journal* for May 30, p 192

---

1 Williams, D *J Neurol Psychiat* 1941, 4 257
2 Thorner M , Gibbs, F A Gibbs, E L *War Med* 1942, 2,
3 Birley, J L *Lancet*, 1920 i, 1127
4 Gallagher J R and Gibbs, F A Unpublished c
quoted by Thorner, Gibbs and Gibbs

Special Article

FAILURE OF STATE MEDICINE IN NEW ZEALAND

“In countries where rulers are chosen by popular vote is no likelihood that startlingly novel and unacceptable will be initiated by central authority In such the movement for reform must always start at the and move towards the centre Private individuals, alone or in groups, must formulate the ideas of reform must popularise it among the masses When it has sufficiently popular it can be incorporated into the tion of the community ”—ALDOUS HUXLEY in “Ways Means,” p 127

recent history of reform in the organisation of al practice in New Zealand bears out the truth of generalisation The clumsy attempts of the Labour nment which came to power in that country in , to construct a state medical service, and the ance offered to them by the medical profession h the BMA, were succinctly and effectively rised in a special correspondent's article in the *ical Journal of Australia* 1st November (p 602)

1936 and 1937 the government discussed with the ion plans for a comprehensive medical service government wanted a free medical service for the le population, including general practitioner service tals, laboratory work and specialists The BMA l a free service for the indigent and a contributory of insurance for the less well off, but wished to e unchanged the existing system by which those who d afford to pay the general practitioner or the specialist so either privately or through friendly societies In these discussions ended in deadlock, after which September the government introduced its Social ty Act, which shortly became law This raised y by a shilling in the pound tax on practically every ie in the country and proposed therewith to finance nerous pensions scheme and a comprehensive series cal, hospital and related benefits This act was a r issue in the election of November, 1938, in which Labour government was returned to power An pt to resume negotiations with the BMA was made 939 In that year treatment in all mental hospitals h are government institutions) was made free, a maternity benefit scheme was introduced and modification accepted by the profession Under latter, the general practitioner merely reports to the MOH the fact that he has attended a maternity and receives a payment from the Social Security of £5 5*s* plus certain extras in respect of complica- and mileage, he may not charge the patient any A recognised obstetric specialist, if called in, may e the patient what fee he likes This procedure has general satisfaction In the same year the govern- began to pay 6*s* per day per occupied bed to all itals both public and private, the former ceased to t the small sums of money they had previously ived from patients and their demands on local rates slightly reduced, while the nursing-homes were able lower their charges to private patients Where the of public hospitals had previously been honorary, now began to receive part-time salaries ranging £250 to £600 per annum

February, 1941, after further fruitless discussions the profession, the government introduced a general itioner service available to all, on a capitation basis bers of the public were invited to enrol on the lists of rs of their choice (without numerical limit), the rs accepting them would render medical service, receive from the Social Security Fund 15*s* per head annum, with mileage extras The public made little to avail itself of this invitation, and fewer than fifty rs cooperated out of over seven hundred in the try The scheme failed In November, 1941 the rnment introduced a new scheme of payment for al practitioner services similar to that already ting for maternity services Seven shillings and nce was fixed as the basic fee for “ seeing a patient ” doctor's consulting-room The doctor could claim fee from the government on presenting the patient's to a statement that he had been seen and treated, or, alternatively, he could charge the patient 7*s* 6*d* or any higher fee and empower the patient to recover from the Post Office a rebate of 7*s* 6*d* on every fee paid Under the latter alternative, however the doctor could not sue an unwilling patient for more than 7*s* 6*d* per service Both procedures are now in use, though it is not clear on how extensive a scale

The whole story makes dismal reading The ideal which should have imbued such a reform as the government attempted—namely the provision of better medical advice and treatment for the people and better conditions and opportunities of work for the doctors—has been lost sight of in a welter of short-sighted and acrimonious controversy over the size and payment of fees It is evident that the government has not subjected its problem to unbiased expert study, it has not merely failed to secure the profession's sympathetic cooperation but has on occasions failed to acquaint the profession with its intentions, it has rushed into inept and piecemeal action without adequate preliminary planning It is equally evident that the BMA in New Zealand has shown little in the way of constructive vision, it has certainly failed to direct the government's idealism, sanctioned by the people, into practical and effective channels, it seems to have been more concerned with preserving as far as possible the status quo, rather than with seizing the opportunity of re-moulding the profession's relations with the community in the interests of better health and better service

A DREAM OF THE FUTURE

In New Zealand the rulers chosen by popular vote did indeed attempt to initiate the startlingly novel reform, but have not succeeded Meanwhile the private individual on the periphery, combining expert knowledge with disinterested zeal for improvement, is formulating the ideas of reform and urging it upon the public Douglas Robb, an Auckland surgeon, writes a pamphlet on health services for the N Z Institute of International Affairs [1] In general practice he deplores the ascendancy of curative over preventive medicine, the constraints imposed by the fee system and competition between doctors, the overworking of the successful doctor and the uneven distribution of doctors in the community The hospitals he finds often too easy-going in respect of their clinical standards, incoordinate and haphazard in their development, directed in their policy too much by local politicians and too little by broad-viewed medical opinion He chides the public for its lack of interest and the doctors for their lack of collective enterprise His dream of the future is a salaried general practitioners service, organised in “ clinics ” [2] each of which, housed in a dignified and well-equipped modern building shall serve 20,000 to 30,000 people The medical staff of the clinic, dividing the work to be done among its members as it sees fit, will do everything for its patients that a good practitioner now does, and a good deal more besides It will undertake the medical supervision of school-children preventive inoculations, antenatal care, public lecturing, and other tasks which in the past have fallen upon public health authorities because the private practitioner could not or would not perform them adequately It will have nurses, masseuses and ambulances at its disposal Its doctors (and their wives) will have regular and reasonable leisure and holidays The cherished principle of the personal doctor-patient relationship, or better doctor-family relationship, may be somewhat encroached upon, but hardly more than it is at present by the multiplicity of public-health services with independent staffs, against this may be set the likelihood that the patient will develop faith in the group of doctors whose varied skill and experience will supplement those of the one among them who when available is his particular choice Behind this clinical scheme, and closely integrated with it, Robb will have a system of hospitals, sharing among them, according to their size, staff and situation, the treatment of inpatients, and relieved of the burden of running large outpatient departments In them he hopes to see a much richer development of teaching, study, and research than has hitherto been possible in New Zealand He insists wisely on complete academic and scientific freedom in thought and expression, and on the greatest possible freedom for the individual member of the whole service to pursue the line of work that most interests him

---

[1] Health Services or Doctors and Hospitals Wellington, N Z N Z Co-op Publishing Society 6*d*

[2] See Robb D Medical Practice in Clinic Form *N Z med J* (suppl) October, 1941, p 2

Such a plan cannot be adopted and carried out in a day or a year No amount of discussion of such a plan on paper will decide whether it *is* an improvement on things as they are Like a scientific hypothesis, it should be studied from the standpoint, "Is it the best we can think of?" If so, then it should be subjected to trial by experiment So Robb pleads for an expert commission, largely medical, with young members in it as well as old, to spend two years studying the whole field of medical and allied services in New Zealand, and then to formulate its recommendations If the clinic system of practice is approved, he would establish trial clinics in one or two small towns, and in one or two suburban areas of large towns, and observe their working If they succeed, they can be gradually multiplied to replace existing private practice slowly and relatively painlessly Reorganisation of the hospital system and its control will come at the same time, and reconstruction of the medical curriculum, designed to choose and train students in appropriate numbers for the new services, will follow It is easy to draw pictures of a New Jerusalem It is difficult to devise orderly and practical steps by which the old may be transformed into the new The reformer who does both is likely to be a man worth listening to

---

POSTWAR RECONSTRUCTION IN RADIOLOGY

Two sessions of the annual general meeting of the Faculty of Radiologists held in Manchester on June 5 and 6, were devoted to a symposium, under the chairmanship of Dr Cochrane Shanks, on the problems of radiology after the war

The Future of the Specialties

Prof Geoffrey Jefferson (Manchester)

Each specialty has its own problems and each is regarded by the "other fellow" as unnecessary and wasteful yet each has its own needs which must be formulated Specialisation does not cut off its members from the general commonwealth of medicine Good general medical education with adequate hospital experience is essential, but specialisation itself provides liberal education in disease processes and the very long apprenticeship sometimes advocated is not really necessary In planning for the specialties the influence of "growing points" at different periods must be remembered New discoveries give an impetus to research or open new paths for thought and when this happens those who work in the field have exciting opportunities For example, the great names of 1830 and 1840 in microanatomy are now paralleled in electrophysiology, biochemistry, &c The difficulty of obtaining satisfactory balance in specialism can only be overcome in large teaching hospitals At present cases are collected in general wards when they would be better off in special departments Instead, the cases should be collected from the special departments and deliberately brought together in wards set aside for teaching purposes The voluntary hospitals have had great responsibilities and financial difficulties have compelled errors of omission Money must be found for the new form of hospital, which will certainly come, where general and special hospitals will be grouped on one site Another point is the need for transfer of the best brains to the place where they are most required Ties are formed by private practice and university teaching and by the time special ability is recognised it is difficult to break these ties It must be made possible for outstanding personalities to move from one post to another so that each centre will, from time to time, be stimulated by new ideas and a fresh outlook Radiotherapy has extended interests in many fields but the cooperative movement has been born and is strong enough to formulate a plan of combined action

What we may Expect from Physics

Prof W V Mayneord (London)

Progress on the technical side has been very rapid X-ray apparatus working at a million volts is now in use at several centres and methods of electron acceleration to speeds of 100 million volts seem possible Artificial radioactivity produced in various suitable substances is being used in physiological research and to a small extent for treatment The positive electron is being studied and negative electrons are being used for irradiation The possibility of determining the depth at which the maximum energy would be liberated may make neutron therapy a very important weapon in the treatment of disease The system of measurement must be standardised and should include ultraviolet and infrared radiation This fundamental standardisation would allow more accurate study of biological variations. The physicist is useful to both the diagnostician and the therapist but is essential as a member of the therapy team He should be in close relation with an university should teach radiological and radiographic students and train physicists so that all radiotherapeutic centres could have the services of a specially trained worker

Organisation of Radio-diagnostic Services

Dr C G Teall (Birmingham)

Some towns are well, but some ill, served under the present arrangement by which the quality of the work depends on whether there is enough private practice to maintain a radiologist After the war there must be a regional scheme sponsored by the Government, and to assure its success private patients would have to be dealt with in voluntary hospitals Medical officers must then be paid, and radiologists would see all classes of patient at the hospitals where equipment would be of a high standard Appointments would have to be made by a regional committee, not by individual hospitals though the hospitals could make recommendations There would be a regional director with experienced radiologists at divisional hospitals and juniors to visi small units It would also be desirable to arrange fo radiography at the patient's home by small mobile unit such as those now provided under EMS schemes

Radiological Education of the Future

Dr H Graham Hodgson (London)

It is time for radiologists to set their house in orde and improve the course of teaching for the diploma in radiology At present it is much too short, candidate being expected to acquire a knowledge not only o radiodiagnosis and therapy but of the medicine, surgery and pathology which will allow them to read films o give special treatment This could not be done even i the whole nine months allotted were free for this purpose but in fact nearly half the time is spent on learning enough physics to pass the first part of the examination For the diagnostic radiologist all this study of physic is unnecessary—a course of six lectures would teach him what he needs to know *Diagnosis and therapy should* be separated and that there should be different course each taking a full year or more and each having a quali fying examination It would always be possible to take both and have both qualifications The FR ha already recognised the separation of the two subjects and also the need for a high standard of general medica knowledge, the candidates for the fellowship having to pass their examination in medicine, surgery and pathology as well as in the special subject

Mr G F Stebbing (London)

From the point of view of the therapist the two subjects at present included in the diploma course should be separated There is a need for good junior appointments in which the radiological students could find opportunities to acquire general as well as special knowledge The long and difficult apprenticeship of the radiotherapist makes it necessary that he should look forward to a status equal to that of any other colleague of equal seniority

The Cancer Act

Dr Ralston Paterson (Manchester)

A quantitative assessment of the situation can be made from a table showing the numbers of each type of cancer—accessible, treatable and hopeless—which may be expected per million of the population and the probabl numbers likely to be allocated for treatment by surge and radiotherapy With this assessment in mind pla for a cancer unit can be examined The treatment o cancer must become a completely specialist branch o medical practice, homologous to the treatment of tuber

The cancer unit may be either a specialist or a special branch of a teaching hospital and serve a population large enough to provide t clinical material and permit special experience the necessary medical officers There must be two sections—surgery and radiotherapy—together gynæcology laryngology, and the other specialist diagnostic services The radiotherapy section must e both radium and X rays Transference of radium ent from surgeon to radiotherapist already well the way must be completed and the radiologist decide whether he prefers diagnosis or therapy retain only that half of the subject which he has

In the surgical section there should be central- u such as would permit more extensive experience the individual specialist than is now possible To h the cancer case at an early stage multiple clinics be available These should be held in the district t ls and should not be known as cancer clinics certain cases diagnosis can be made from clinical visible and palpable, but special radiological and nental methods may be needed The medical r of the clinic need only be able to recognise the s clinical cancer and the type of symptom- lex indicating the need for special investigation the patient reaches the central unit decision ding treatment usually lies between radiotherapist surgeon or appropriate specialist, or between a and specialist. Propaganda is best served by n ely simple methods

In England Now

Running Commentary by Peripatetic Correspondents

THIS is about my journey across China for more 2000 miles the last phase in my odyssey. It n at Wanting on the frontier of Burma, and is now ly ended

I have tried several times to describe the Burma , but could never do it justice It is indeed one Wonders of the World as it crosses with a carefree don mountains and gorges which must have given tmares to the most optimistic of engineers and yet llows its long and tortuous course with a care and on which ensure that, in a truck carefully handled, is reduced to a minimum Two landscapes stand as especially memorable The first is the view from ridge before the gorge of the Salween Here we see our road 40 miles ahead, crossing like a faint scratch the almost vertical surface of a hill 4000 high Below us 4000 feet down ran the green rs of this great river which rises 200 miles north of in the centre of Tibet, and away in the background, after range, lay all the mountains of Yunnan other outstanding item in this kaleidoscope of us landscapes was the view of 14 000 foot Hsiakwan tain, rising to its snow capped peaks above the [illegible] river The greatest altitude attained by this is 8000 feet above sea level In many ways it is ge road and not least in that in all its length it practically no branches and no side turnings It forced its way across virgin mountains with a pur- nly the dynamic of war could have created such

Over this great road I led a convoy of 6 American s each with its load of goods for the Red Cross ies of Free China

e road brought us to the city of Kunming, a place beautifully situated on a lake where what od and decadent is in obvious conflict with thing new and vital and very strong which is ening the south-west of China from an age old ber which only war could threaten Beyond ing 480 miles across much wild and sparsely bited country brought us to Kweiyang, provincial tal of Kweichow province On the way we passed ugh the country of the Miao a strange non-Chinese ple who live a harmless peasant life in the moun- of Kweichow, painfully at the mercy of the ubiqui- Chinese bandits who are particularly numerous this province Here we stayed as the guests of some onaries, who specialise in Miao work They told a lot about these delightful people, who have made encouraging response like oppressed tribes elsewhere, to the efforts of the Christian evangelist Working among them is not made easier by the fact that there are 70 different races of Miao in Kweichow, and most of these have their own forms of speech We discovered that the Miao resemble the Scots in living among hills forming clans, eating oatmeal porridge, playing the bagpipes: and wearing kilts So far our investigations have failed to show whether the haggis can be brought into the picture!

Kweiyang is of great importance in Free China Here the route from Burma and the outside world ends and a series of supply lines to different parts of China begins —north to Chungking east to Hunan and south to Kwangsi Until 1938 there were not 12 qualified doctors in Kweichow province with its 12 000 000 inhabitants Today one found in Kweiyang three medical schools one military and two civilian One of these which has arisen de novo has ambitious plans for a fine new hospital and campus on a site outside the city There are several independent hospitals, in one of which incidentally I was lucky enough to see 8-day-old Siamese twins, they were face to face as if locked in a fond embrace being joined by their bodies Here in Kweiyang is the big Red Cross organisation responsible for distributing supplies that have come mainly from America to the hospitals of China In the Red Cross hospital I found two disreputable looking but cheerful British sailors who had escaped with a party about 60 strong from Hong-Kong They had reached land in motor torpedo boats and then led by one-legged Chinese Admiral Chen and friendly Chinese guerillas, had escaped across no-man's land The two I met had been involved in a lorry accident just outside Kweiyang, and had had to be left behind in hospital to recover from their injuries which were not serious. Later I met Admiral Chen himself

* * *

The next stage in the journey was made owing to the difficulty of obtaining petrol increasing the further you go into inland China in a charcoal-burning truck The fuel used is locally made charcoal broken up small A small furnace below in front of the driver's cab burns this and generates an inflammable gas which is passed through an elaborate series of filters situated under the chassis of the truck, and is then mixed with air and fed into the engine instead of petrol vapour The cost of this fuel is negligible compared with petrol, so the method has possibilities We soon discovered that driving one of these trucks was not all easy going There are so many controls and starting the engine is so complicated that the driver needs a trained man to assist him Then the top speed attainable on this particular model (about the best yet produced) is only 20 m p h Then there are six gears, and on anything like a steep hill bottom gear is absolutely necessary, but alas changing down into bottom without stopping and much coaxing is almost impossible Another thing that adds interest to the run is that charcoal is bought in large sticks, and the furnace is very fussy about its food One fragment exceeding a certain small size is quite likely to choke its fuelling mechanism, and produce the most disastrous consequences So all charcoal has to be broken up and sorted by hand Twice a day driver and passengers fall to with hammers and smash the sticks of charcoal up into little pieces This is generally done on the ground in the main street of a village and provides a high form of entertainment for the local inhabitants who make a tight ring of spectators about 12 deep all around us One night we were going on late to make up for some lost time and about 10 P.M., just as we thought we were reaching our destination we learned to our dismay that the charcoal was running out It looked as though we should either have to stop where we were all night—we were at the top of a mountain pass—or else break up charcoal and reload A Chinese passenger was very nervous about bandits, and said that stopping there would be most unwise, so we got out, and in spite of a very unpleasant drizzle made the best of a bad job and reloaded our furnace This wasn't much fun for anybody, and we were all heartily glad when we did get to bed that night

This journey of 250 miles on the charcoal truck brought us down into Kwangsi province to an area with the strangest landscape I have ever seen anywhere Here freedom in thought and expression, and on the greatest possible freedom for the individual member of the whole service to pursue the line of work that most interests him

Such a plan cannot be adopted and carried out in a day or a year No amount of discussion of such a plan on paper will decide whether it *is* an improvement on things as they are Like a scientific hypothesis, it should be studied from the standpoint, " Is it the best we can think of ? " If so, then it should be subjected to trial by experiment So Robb pleads for an expert commission, largely medical, with young members in it as well as old, to spend two years studying the whole field of medical and allied services in New Zealand, and then to formulate its recommendations If the clinic system of practice is approved, he would establish trial clinics in one or two small towns, and in one or two suburban areas of large towns, and observe their working If they succeed, they can be gradually multiplied to replace existing private practice slowly and relatively painlessly Reorganisation of the hospital system and its control will come at the same time, and reconstruction of the medical curriculum, designed to choose and train students in appropriate numbers for the new services, will follow It is easy to draw pictures of a New Jerusalem It is difficult to devise orderly and practical steps by which the old may be transformed into the new The reformer who does both is likely to be a man worth listening to

POSTWAR RECONSTRUCTION IN RADIOLOGY

Two sessions of the annual general meeting of the Faculty of Radiologists, held in Manchester on June 5 and 6, were devoted to a symposium, under the chairmanship of Dr COCHRANE SHANKS, on the problems of radiology after the war

The Future of the Specialties

Prof GEOFFREY JEFFERSON (Manchester)

Each specialty has its own problems and each is regarded by the " other fellow " as unnecessary and wasteful yet each has its own needs which must be formulated Specialisation does not cut off its members from the general commonwealth of medicine Good general medical education with adequate hospital experience is essential, but specialisation itself provides liberal education in disease processes and the very long apprenticeship sometimes advocated is not really necessary In planning for the specialties the influence of " growing points " at different periods must be remembered New discoveries give an impetus to research or open new paths for thought and when this happens those who work in the field have exciting opportunities For example, the great names of 1830 and 1840 in microanatomy are now paralleled in electrophysiology, biochemistry, &c The difficulty of obtaining satisfactory balance in specialism can only be overcome in large teaching hospitals At present cases are collected in general wards when they would be better off in special departments Instead, the cases should be collected from the special departments and deliberately brought together in wards set aside for teaching purposes The voluntary hospitals have had great responsibilities and financial difficulties have compelled errors of omission Money must be found for the new form of hospital, which will certainly come, where general and special hospitals will be grouped on one site Another point is the need for transfer of the best brains to the place where they are most required Ties are formed by private practice and university teaching and by the time special ability is recognised it is difficult to break these ties It must be made possible for outstanding personalities to move from one post to another so that each centre will, from time to time, be stimulated by new ideas and a fresh outlook Radiotherapy has extended interests in many fields but the cooperative movement has been born and is strong enough to formulate a plan of combined action

What we may Expect from Physics

Prof W V MAYNEORD (London)

Progress on the technical side has been very rapid X-ray apparatus working at a million volts is now in use at several centres and methods of electron acceleration to speeds of 100 million volts seem possible Artificial radioactivity produced in various suitable substances is being used in physiological research and to a small extent for treatment The positive electron is being studied and negative electrons are being used for irradiation The possibility of determining the depth at which the maximum energy would be liberated may make neutron therapy a very important weapon in the treatment of disease The system of measurement must be standardised and should include ultraviolet and infrared radiation This fundamental standardisation would allow more accurate study of biological variations The physicist is useful to both the diagnostician and the therapist but is essential as a member of the therapy team He should be in close relation with an university, should teach radiological and radiographic students and train physicists so that all radiotherapeutic centres could have the services of a specially trained worker

Organisation of Radio-diagnostic Services

Dr C G TEALL (Birmingham)

Some towns are well, but some ill, served under the present arrangement by which the quality of the work depends on whether there is enough private practice to maintain a radiologist After the war there must be a regional scheme sponsored by the Government, and to assure its success private patients would have to be dealt with in voluntary hospitals Medical officers must then be paid, and radiologists would see all classes of patient at the hospitals where equipment would be of a high standard Appointments would have to be made by a regional committee, not by individual hospitals though the hospitals could make recommendations There would be a regional director with experienced radiologists at divisional hospitals and juniors to vis small units It would also be desirable to arrange fo radiography at the patient's home by small mobile unit such as those now provided under EMS schemes

Radiological Education of the Future

Dr H GRAHAM HODGSON (London)

It is time for radiologists to set their house in orde and improve the course of teaching for the diploma in radiology At present it is much too short, candidate being expected to acquire a knowledge not only o radiodiagnosis and therapy but of the medicine, surger and pathology which will allow them to read films o give special treatment This could not be done even i the whole nine months allotted were free for this purpose but in fact nearly half the time is spent on learning enough physics to pass the first part of the examination For the diagnostic radiologist all this study of physic is unnecessary—a course of six lectures would teach him what he needs to know Diagnosis and therapy should be separated and that there should be different course each taking a full year or more and each having a qualifying examination It would always be possible to take both and have both qualifications The FR ha already recognised the separation of the two subjects and also the need for a high standard of general medica knowledge, the candidates for the fellowship having to pass their examination in medicine, surgery and patholog as well as in the special subject

Mr G F STEBBING (London)

From the point of view of the therapist the two subjects at present included in the diploma course should be separated There is a need for good junior appointments in which the radiological students could find opportunities to acquire general as well as special knowledge The long and difficult apprenticeship of the radiotherapist makes it necessary that he should look forward to a status equal to that of any other colleague of equal seniority

The Cancer Act

Dr RALSTON PATERSON (Manchester)

A quantitative assessment of the situation can be made from a table showing the numbers of each type of cancer—accessible, treatable and hopeless—which may expected per million of the population and the pr numbers likely to be allocated for treatment by su and radiotherapy With this assessment in mind for a cancer unit can be examined The treatment cancer must become a completely spec medical practice, homologous to the

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS M P

T the beginning of this century Mr Sidney Webb , in the true Fabian manner, that a course in manners should be instituted in all schools The title was to be " table manners (materials provided) " it has taken half a century to obtain the large increase provision of school meals which the President of Board of Education announced last week Out of ,000 children attending grant-aided schools over 000 now take a midday meal at school and about ,000 receive milk at school The milk-in-schools ie by which children can get a third of a pint for a nny is now to be extended to schools of all types, there is to be a " further drive for meals and milk " extension of school feeding is a revolution in habit profound significance and the serious shipping losses we now sustaining will give added impetus to the move- t If further austerity cuts in our consumption are red, the schools will be able to help to maintain the h of the children with economically provided meals milk Miss Megan Lloyd George who represents esey was justifiably proud of the tribute the Minister to her constituency where there are already canteens 80% of the schools, and the achievement of Anglesey a tribute also to the value of the woman M P and the nce of the woman's vote'

Mr Butler ascribed the improvement in health in l children since war began to extra milk and school . But something surely is to be put to the credit rural dispersion So great is this dispersion that special in rural subjects are a feature of many schools aps it may also be said that an appreciation of rural omy by the allotment holder and back-garden table cultivator is an important element in all of our as well as a contribution to our improved health ical inspection and treatment services for children being maintained and the volume of treatment in l was almost as great as that given in the years before war

* * *

The committees to investigate educational problems of rtance included one on the training of teachers under chairmanship of Mr A D McNair, LLD, vice-chan- or of Liverpool University, a youth advisory council er Mr J F Wolfenden, headmaster of Uppingham, "expert investigation" into examinations and the cula of secondary schools and an inquiry under l Fleming, a Scottish Lord of Session, into what is in t the extension of the boarding-school system of the blic schools to elementary and secondary school- ren Mr Butler asked for the help of the House in work of "path-finding to the new world" Many mbers congratulated him on this first statement on ucation he has made but many it was clear would have ked to have gone still further towards a system in hich educational institutions of all types would be rged in one system in which all children, irrespective class or of parental income, would have equal oppor- ty To this ideal family allowances would make a e contribution

* * *

It is hoped that Mr Ernest Brown will be able to ounce next week the date of the long-deferred debate health The problem of the nutrition of the whole ion, the newly projected medical service for mines the proposals for health services and their staffing t forward "for discussion" by the Medical Planning ittee of the BMA give scope for a comprehensive tement Add to this the ministry's investigations on hospital problem after the war and the plans which being discussed for international medical relief on a orld-wide scale which are known to be under dis- ion and there is a very full programme Mr Butler, presenting his statement, claimed that education d be regarded as a major department of state much more true is this claim for the Ministry of th? It is indeed perhaps significant of a new stage e war that, despite reverses and the growing stress ar, the reconstruction and peace-building depart- ar ing to the front

FROM THE PRESS GALLERY

Health of School-children

INTRODUCING the Education Estimates for 1942 in the House of Commons on June 16 Mr R A BUTLER the president of the Board of Education, said that perhaps the most important improvement during the last year had been the drive to increase the provision for meals and milk Over 700,000 children now took midday meals at school Last year 1733 proposals providing for 210 000 children were approved, and from January to May of this year an increase covering some quarter of a million children' had been sanctioned He saw no reason why the target of 1,000,000 meals a day for children should not be reached by the end of the summer The county of Anglesey led, with canteens for over 60% of its schools, and the authority expected to have them everywhere in its area by the end of this term The director of education there said the provision of school meals was reflected in the physical well-being of the children, in their zest for life and in their alertness Mr Butler trusted that this remarkable lead would be followed not only in Wales but also in England The health of the children—largely thanks to these proposals and because some 3,250,000 children were getting milk at school—had improved in spite of war time conditions It had now been decided to extend to all schools the milk-in schools scheme, which was at present confined to grant-aided schools This would mean that all school-children would be able to obtain milk at ½d for a third of a pint The volume of medical and dental treatment given to school-children during 1941 was almost as great as that given in 1940 and the years immediately before the war He admitted, however that was not to say everything was all right The loss of doctors due to calling up for military service had been severe, but the board were doing their best to meet the situation

Pensions for Seamen

In the House of Lords, on June 16, Lord CORK and ORRERY complained that in the new bill giving pensions to merchant seamen practically all medical cases were ruled out A physical injury was defined as "anything which occurred at a definite point of time," but it was impossible to say with certitude when tuberculosis started Yet the incidence of tuberculosis among seamen was greater than among the population as a whole, and long voyages in the black-out under the strain of war conditions had further weakened the men's powers of resistance to infection Under the present system, at a certain sanatorium out of 36 Naval claimants 31 had pensions and of 11 claimants from the Merchant Navy none had pensions Lord MOYNE, Lord ADDISON and Lord SOULBURY supported Lord Cork's plea, and Lord MARCHWOOD pointed out that the loss of a lung might be more disabling than the loss of a limb

Viscount CLIFDEN, replying for the Government, said that if tuberculosis was the result of the matters mentioned in clause I of the bill, it would be covered Thus a case arising from exposure on a raft would be eligible for a pension But if the disease was only due to "war conditions" in the general sense of the term, it was not covered , but neither was any other civilian workman covered for tuberculosis arising in this way There was no requirement that the illness must start at a point of time

QUESTION TIME

Medical Supplies for Occupied Territories

Mr A EDEN, in answer to a question, said the Government are acutely aware of the horrors and deprivations inflicted on the peoples in the occupied territories by the enemy, and they have facilitated such schemes for bringing food relief as appeared to them not to impair the effect of the blockade upon the enemy's war effort, and they have always been ready to further the transit of medical supplies, within the strict sense of the term, to occupied territory

Medicines for Prisoners of War

Sir ALFRED KNOX asked the Secretary of State for War for what reason the British Red Cross had prohibited the sending of medicine or concentrated vitamins to prisoners of war by relatives in the quarterly individually addressed invalid com forts parcels —Sir J GRIGG replied The examination by the vast numbers of isolated rocky hills rise from a level plain, with sides as steep and precipitous as to be almost impossible of ascent by anyone but the expert rock climber As a happy hunting ground for anyone interested in this sport Northern Kwangsi province has much to recommend it The neighbourhood is so covered with these strange precipitous hills that in an area a few miles square one might find great numbers of isolated peaks requiring the highest degree of skill for their ascent One is tempted to wonder whether one has left the earth altogether, and got lost amid lunar mountains

Here in Kwangsi I said goodbye to the "Sentinel" (charcoal truck) and joined my first Chinese railway This was at Chinchienchiang, a noisy crowded town that has sprung suddenly into a cheap sort of prosperity under the stimulus of the railway as this is extended west towards Kweiyang and Burma These railheads are of the greatest importance in the economy of free China just now The railway hotel at C, was clean and cheap, and a delightful contrast in every way to the inns characteristic of old China The train which took me to the provincial city of Kweilin was almost luxurious, the second-class compartment where I spent a really comfortable night contained four well-sprung berths and plenty of room for luggage There was a good light and an electric fan The smart and friendly steward kept bringing round tea containing chrysanthemum petals and in the course of one afternoon and evening he offered me a steaming hot cloth on which to wipe hands and face no less than six times

The train stopped two hours at Liuchow and we—a Chinese friend and I—had supper in this city whose name means ' The City of Willow Trees " To the Chinese the association between willow wood and cricket bats is unknown The willows of Liuchow are used for making combs, coffins and cosmetics—the burnt wood is used in the art of improving on the eyebrows designed by Nature So famous and so satisfying are the coffins of Liuchow that a Chinese saying tells one to "be born in Suchow, to live in Hankow, to eat in Canton and to die in Liuchow" We preferred to pass on in our comfortable express to the clean and beautiful city of Kweilin Here we were entertained to lunch by a kind lady missionary, who came to this city 31 years ago, at which time she was the first doctor (in the modern sense) to practise in the city Kweilin has changed fast, especially in recent years, and in addition to Dr Bacon's little maternity hospital we were shown round a fine provincial hospital, and an active and independent medical college Of the many interesting things we saw in Kweilin, not the least was the great limestone cave now used as an air-raid shelter, and capable of accommodating practically the whole population of the city

* * *

On the next phase of my journey, to Hengyang in Hunan province, I was accompanied by an expert from the government epidemic prevention bureau, who was a great help In Hengyang I stayed two days and a night as the guest of some hospitable American missionaries, The chief event during my stay in this city, which lies 100 miles or so to the south of Changsha, the scene of several unsuccessful Japanese campaigns and formerly the chief city of Hunan, was the unexpected arrival of an American business man who had succeeded in extricating himself from Hong-Kong Briefly his story was that the fall of Hong-Kong (on Christmas Day) was followed by a series of acts of atrocity by the occupying Japanese army, which, while controlled in areas where its progress is not hindered, seems to relieve its feelings after gaining a hard-won victory by indulging in a reign of terror in which the etiquette of war and the elements of decency are forgotten In Hong-Kong it was against the British and American population that this savagery was directed After ten days all British and American residents were "invited" to report at certain military barracks, and were then interned in empty hotels—under conditions which were reminiscent of the worst one has heard of European concentration camps Our American did not respond to this invitation, but hid himself The house where he was staying was searched four times by Japanese soldiers, but he evaded them Two Chinese boys attached themselves to him and helped him to escape, and later accompanied him into free China They negotiated for a boat, and on Jan 10, after nearly three weeks of Japane occupation they started Mr D was disguised as Spanish refugee He walked openly past six lots o Japanese sentries, who all scanned him He was onl questioned by one of them, and on this occasion said h was Spanish, and was allowed to pass though most o his property was taken from him—he was only carryin one small bag and had his money sewn into the turn up of his trousers This would have been all right—i was not found—but alas the trousers were taken fr him in toto The small boat took him with his faith Chinese followers part way across the water, but t rest of the journey to the mainland had to be made i larger boat This happened to be operated by a ba of pirates During the night they spent in this bo there was a battle in which the pirates were killed a thrown overboard After escaping from this lit incident the three of them spent nearly a month walki across the guerilla country and province of Kwangtu to Shaokwan, whence the Hankow-Canton railway to them north to Hengyang Mr D stayed a few hou before moving off on his journey west towards Bur and his home in America So much for Mr D O hopes that the rest of his journey will be more tranqu

Another comfortable night in the train brought me Shaokwan in the north of Kwangtung province He I met Admiral Chen who also had escaped from Hon Kong He looked old and far from well He has o one leg, and at the time of his escape one arm was brok by a bullet wound, but in spite of these handicaps had managed to leave his ship when under machine-g fire and swim ashore After this he succeeded assisting a party of about 60 British Naval men in t long trek through the guerilla country to safety I had been treated, not unnaturally, as a national he and had been given feasts in celebration One of the had evidently been too much for his gastric ulcer, and had had a hæmorrhage from it A missionary Shaokwan had given a pint of blood for transfusion, a in his gratitude the Admiral had given the missiona a bottle of whisky The missionary was wonderi what to do with the whisky

* * *

The last phase of my journey introduced me to lon distance bus travel in China The experience was no I understand, atypical The bus was 5½ hours late starting It was a motor lorry with a wooden bod almost without windows and without seats Th passengers who filled it sat on their luggage and o each other, but a cheerful atmosphere prevailed mo of the time The bus went a few miles and then brok down and a front spring had to be changed We spe two days on the way instead of the scheduled one

And so I came to the 8th New Life Medical Unit i Kanhsien in the Southern half of Kiangsi Province I was very glad to be back in hospital and to be worki where there are real live patients to be operated on in theatre better equipped than I had expected

---

FIFTY PROTECTIVE YEARS

AT the annual general meeting of the London an Counties Medical Protection Society, on June 3, it w recalled how in 1892 the society opened its bankin account with a deficit of thirty shillings But its usef work was quickly recognised, for by the end of the yea it had acquired 700 members and a capital of £15 Today its accumulated funds amount to over £85,000, o which a special sum of £5000 has been put aside to mee emergencies Sir Cuthbert Wallace in his presidentia speech made tantalising reference to the early report which he dubbed as somewhat flippant Today the public utterances were couched in more statesmanlik language, but their problems were often the same fo "Indian oculists" and "specialists in corpulency" were still as wayward as in the past The war ha reduced the volume of the society's work, for people hav little patience with trivialities, but those cases that hav come up have been serious He reminded member that even if they take up official employment or ente the Services they might still require protection Latel the society had been concerned in two actions agains a local government body and had also represente members before courts-martial

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS M P

the beginning of this century Mr Sidney Webb , in the true Fabian manner that a course in manners should be instituted in all schools The was to be "table manners (materials provided)" It has taken half a century to obtain the large increase provision of school meals which the President of Board of Education announced last week Out of ,000 children attending grant-aided schools over now take a midday meal at school and about ,000 receive milk at school The milk-in schools by which children can get a third of a pint for a nny is now to be extended to schools of all types, there is to be a "further drive for meals and milk" extension of school feeding is a revolution in habit found significance and the serious shipping losses we now sustaining will give added impetus to the move- If further austerity cuts in our consumption are , the schools will be able to help to maintain the h of the children with economically provided meals milk Miss Megan Lloyd George who represents y was justifiably proud of the tribute the Minister to her constituency where there are already canteens o of the schools, and the achievement of Anglesey tribute also to the value of the woman M P and the nce of the woman's vote

Butler ascribed the improvement in health in l-children since war began to extra milk and school But something surely is to be put to the credit al dispersion So great is this dispersion that special in rural subjects are a feature of many schools ps it may also be said that an appreciation of rural y by the allotment holder and back-garden ble cultivator is an important element in all of our as well as a contribution to our improved health l inspection and treatment services for children being maintained and the volume of treatment in was almost as great as that given in the years before war

* * *

committees to investigate educational problems of ance included one on the training of teachers under chairmanship of Mr A D McNair, LLD vice-chan- of Liverpool University, a youth advisory council Mr J F Wolfenden, headmaster of Uppingham, 'expert investigation" into examinations and the ula of secondary schools and an inquiry under Fleming, a Scottish Lord of Session, into what is in the extension of the boarding-school system of the c schools to elementary and secondary school- n Mr Butler asked for the help of the House in work of "path-finding to the new world" Many bers congratulated him on this first statement on ation he has made but many it was clear would have to have gone still further towards a system in h educational institutions of all types would be ed in one system in which all children, irrespective class or of parental income, would have equal oppor- ty To this ideal family allowances would make a contribution

* * *

It is hoped that Mr Ernest Brown will be able to unce next week the date of the long-deferred debate health The problem of the nutrition of the whole on, the newly projected medical service for mines the proposals for health services and their staffing forward "for discussion" by the Medical Planning ttee of the BMA give scope for a comprehensive ment Add to this the ministry's investigations on hospital problem after the war and the plans which being discussed for international medical relief on a d wide scale which are known to be under dis- ion and there is a very full programme Mr Butler, presenting his statement, claimed that education d be regarded as a major department of state much more true is this claim for the Ministry of th? It is indeed perhaps significant of a new stage e war that, despite reverses and the growing stress ar, the reconstruction and peace-building depart- are now coming to the front

FROM THE PRESS GALLERY

Health of School-children

INTRODUCING the Education Estimates for 1942 in the House of Commons on June 16 Mr R A BUTLER, the president of the Board of Education said that perhaps the most important improvement during the last year had been the drive to increase the provision for meals and milk Over 700,000 children now took midday meals at school Last year 1733 proposals providing for 210 000 children were approved and from January to May of this year an increase covering some quarter of a million children had been sanctioned He saw no reason why the target of 1,000,000 meals a day for children should not be reached by the end of the summer The county of Anglesey led with canteens for over 60% of its schools, and the authority expected to have them everywhere in its area by the end of this term The director of education there said the provision of school meals was reflected in the physical well-being of the children, in their zest for life and in their alertness Mr Butler trusted that this remarkable lead would be followed not only in Wales but also in England The health of the children—largely thanks to these proposals and because some 3 250,000 children were getting milk at school—had improved in spite of war-time conditions It had now been decided to extend to all schools the milk-in schools scheme, which was at present confined to grant-aided schools This would mean that all school-children would be able to obtain milk at ½*d* for a third of a pint The volume of medical and dental treatment given to school children during 1941 was almost as great as that given in 1940 and the years immediately before the war He admitted, however, that was not to say everything was all right The loss of doctors due to calling up for military service had been severe, but the board were doing their best to meet the situation

Pensions for Seamen

In the House of Lords, on June 16, Lord CORK and ORRERY complained that in the new bill giving pensions to merchant seamen practically all medical cases were ruled out A physical injury was defined as "anything which occurred at a definite point of time,' but it was impossible to say with certitude when tuberculosis started Yet the incidence of tuberculosis among seamen was greater than among the population as a whole, and long voyages in the black-out under the strain of war conditions had further weakened the men's powers of resistance to infection Under the present system, at a certain sanatorium out of 36 Naval claimants 31 had pensions and of 14 claimants from the Merchant Navy none had pensions Lord MOYNE, Lord ADDISON and Lord SOULBURY supported Lord Cork's plea, and Lord MARCHWOOD pointed out that the loss of a lung might be more disabling than the loss of a limb

Viscount CLIFDEN, replying for the Government, said that if tuberculosis was the result of the matters mentioned in clause I of the bill, it would be covered Thus a case arising from exposure on a raft would be eligible for a pension But if the disease was only due to "war conditions" in the general sense of the term, it was not covered , but neither was any other civilian workman covered for tuberculosis arising in this way There was no requirement that the illness must start at a point of time

QUESTION TIME

Medical Supplies for Occupied Territories

Mr A EDEN, in answer to a question, said the Government are acutely aware of the horrors and deprivations inflicted on the peoples in the occupied territories by the enemy and they have facilitated such schemes for bringing food relief as appeared to them not to impair the effect of the blockade upon the enemy's war effort, and they have always been ready to further the transit of medical supplies, within the strict sense of the term, to occupied territory

Medicines for Prisoners of War

Sir ALFRED KNOX asked the Secretary of State for War for what reason the British Red Cross had prohibited the sending of medicine or concentrated vitamins to prisoners of war by relatives in the quarterly individually addressed invalid comforts parcels —Sir J GRIGG replied The examination by the vast numbers of isolated rocky hills rise from a level plain, with sides as steep and precipitous as to be almost impossible of ascent by anyone but the expert rock climber As a happy hunting ground for anyone interested in this sport Northern Kwangsi province has much to recommend it The neighbourhood is so covered with these strange precipitous hills that in an area a few miles square one might find great numbers of isolated peaks requiring the highest degree of skill for their ascent One is tempted to wonder whether one has left the earth altogether, and got lost amid lunar mountains

Here in Kwangsi I said goodbye to the "Sentinel" (charcoal truck) and joined my first Chinese railway This was at Chinchienchiang, a noisy crowded town that has sprung suddenly into a cheap sort of prosperity under the stimulus of the railway as this is extended west towards Kweiyang and Burma These railheads are of the greatest importance in the economy of free China just now The railway hotel at C, was clean and cheap, and a delightful contrast in every way to the inns characteristic of old China The train which took me to the provincial city of Kweilin was almost luxurious, the second-class compartment where I spent a really comfortable night contained four well-sprung berths and plenty of room for luggage There was a good light and an electric fan The smart and friendly steward kept bringing round tea containing chrysanthemum petals and in the course of one afternoon and evening he offered me a steaming hot cloth on which to wipe hands and face no less than six times

The train stopped two hours at Liuchow and we—a Chinese friend and I—had supper in this city whose name means "The City of Willow Trees" To the Chinese the association between willow wood and cricket bats is unknown The willows of Liuchow are used for making combs, coffins and cosmetics—the burnt wood is used in the art of improving on the eyebrows designed by Nature So famous and so satisfying are the coffins of Liuchow that a Chinese saying tells one to "be born in Suchow, to live in Hankow, to eat in Canton and to die in Liuchow" We preferred to pass on in our comfortable express to the clean and beautiful city of Kweilin Here we were entertained to lunch by a kind lady missionary, who came to this city 31 years ago, at which time she was the first doctor (in the modern sense) to practise in the city Kweilin has changed fast, especially in recent years, and in addition to Dr Bacon's little maternity hospital we were shown round a fine provincial hospital, and an active and independent medical college Of the many interesting things we saw in Kweilin, not the least was the great limestone cave now used as an air-raid shelter, and capable of accommodating practically the whole population of the city

* * *

On the next phase of my journey, to Hengyang in Hunan province, I was accompanied by an expert from the government epidemic prevention bureau, who was a great help In Hengyang I stayed two days and a night as the guest of some hospitable American missionaries, The chief event during my stay in this city, which lies 100 miles or so to the south of Changsha, the scene of several unsuccessful Japanese campaigns and formerly the chief city of Hunan, was the unexpected arrival of an American business man who had succeeded in extricating himself from Hong-Kong Briefly his story was that the fall of Hong-Kong (on Christmas Day) was followed by a series of acts of atrocity by the occupying Japanese army, which, while controlled in areas where its progress is not hindered, seems to relieve its feelings after gaining a hard-won victory by indulging in a reign of terror in which the etiquette of war and the elements of decency are forgotten In Hong-Kong it was against the British and American population that this savagery was directed After ten days all British and American residents were "invited" to report at certain military barracks, and were then interned in empty hotels—under conditions which were reminiscent of the worst one has heard of European concentration camps Our American did not respond to this invitation, but hid himself The house where he was staying was searched four times by Japanese soldiers, but he evaded them Two Chinese boys attached themselves to him and helped him to escape, and later accompanied him into free China They negotiated for a boat, and on Jan 10, after nearly three weeks of Japanes occupation they started Mr D was disguised as Spanish refugee He walked openly past six lots Japanese sentries, who all scanned him He was on questioned by one of them, and on this occasion said h was Spanish, and was allowed to pass though most his property was taken from him—he was only carryin one small bag and had his money sewn into the turn up of his trousers This would have been all right— was not found—but alas the trousers were taken fro him in toto The small boat took him with his faithf Chinese followers part way across the water, but th rest of the journey to the mainland had to be made in larger boat This happened to be operated by a ban of pirates During the night they spent in this bo there was a battle in which the pirates were killed an thrown overboard After escaping from this lit incident the three of them spent nearly a month walkin across the guerilla country and province of Kwangtu to Shaokwan, whence the Hankow-Canton railway too them north to Hengyang Mr D stayed a few hou before moving off on his journey west towards Burm and his home in America So much for Mr D O hopes that the rest of his journey will be more tranqu

Another comfortable night in the train brought me t Shaokwan in the north of Kwangtung province He I met Admiral Chen, who also had escaped from Hon Kong He looked old and far from well He has on one leg, and at the time of his escape one arm was brok by a bullet wound, but in spite of these handicaps h had managed to leave his ship when under machine g fire and swim ashore After this he succeeded assisting a party of about 60 British Naval men in th long trek through the guerilla country to safety had been treated, not unnaturally as a national her and had been given feasts in celebration One of the had evidently been too much for his gastric ulcer, and h had had a hæmorrhage from it A missionary Shaokwan had given a pint of blood for transfusion, an in his gratitude the Admiral had given the missiona a bottle of whisky The missionary was wonderin what to do with the whisky

* * *

The last phase of my journey introduced me to lon distance bus travel in China The experience was no I understand, atypical The bus was 5½ hours late starting It was a motor lorry with a wooden bo almost without windows and without seats Th passengers who filled it sat on their luggage and o each other, but a cheerful atmosphere prevailed mo of the time The bus went a few miles and then brol down and a front spring had to be changed We spe two days on the way instead of the scheduled *one*

And so I came to the 8th New Life Medical Unit i Kanhsien in the Southern half of Kiangsi Province I was very glad to be back in hospital and to be workin where there are real live patients to be operated on in theatre better equipped than I had expected

FIFTY PROTECTIVE YEARS

At the annual general meeting of the London an Counties Medical Protection Society, on June 3, it wa recalled how in 1892 the society opened its bankin account with a deficit of thirty shillings But its usef work was quickly recognised, for by the end of the yea it had acquired 700 members and a capital of £15 Today its accumulated funds amount to over £85,000, o which a special sum of £5000 has been put aside to mee emergencies Sir Cuthbert Wallace in his presidentia speech made tantalising reference to the early report which he dubbed as somewhat flippant Today thei public utterances were couched in more statesmanlik language, but their problems were often the same fo "Indian oculists" and "specialists in corpulency" were still as wayward as in the past The war ha reduced the volume of the society's work, for people hav little patience with trivialities, but those cases that hav come up have been serious He reminded member that even if they take up official employment or ente the Services they might still require protection Latel the society had been concerned in two actions agains a local government body and had also represente members before courts-martial

important direct result of the report was the
of the workhouse infirmaries to district hospitals
to which conveyed no taint of pauperism and
tantamount to admission to the workhouse
work on this commission though obstructed at
t had marked him out as a man from whom
leadership might be expected in the future and
came when in 1919, in the flush of enthusiasm for
reform after the war of 1914–18 a public health
Ireland was appointed by the Government with
as its chairman By this time he had been
from a medical inspectorship to be medical
ner and a member of the Local Government
duty of the council was to frame a com-
scheme of reform for the medical services of
to this task Bigger set himself with vigour
of vision and he succeeded in framing a
gained the universal support of the medical
of the country as well as of all progressive
It recommended a complete recasting of the
services of the country, their dissociation from
r laws, the appointment of medical officers of
in every county and the establishment of a part-
State Medical Service to undertake all branches of
medical work, including such work as is done in
Britain by the NHI scheme The report was
ted and published in the summer of 1920, a time
pitious for the pressing of any scheme of social

Events moved rapidly in Ireland in succeeding
and little attention was paid to matters of public
until the country had settled down after the
hment of a national government In 1925,
er, a Local Government Act was passed which
some of the recommendations of the report of
blic Health Council and left the way open for the
But the major part of the council's programme
mains unfulfilled It remains as a record of what
have been and of much which could still be done
en with the establishment of an Irish government
cal Government Board was abolished, Bigger's
as a public official came to an end In another
ity his public life began, for in 1925 he was elected
nber of the Senate on a franchise consisting of all
s in the state over thirty years of age He was
ted some years later and he remained a senator
the abolition of the chamber in 1933 During his
of office he was active in many causes, but always
e promotion of measures directed toward the
vement of the public health In those years also he
he first chairman of the Central Midwives Board
land and of the General Nursing Council He was
nominee for Ireland to the General Medical
il until the Medical Registration Act for Ireland was
in 1925 He had been active in establishing the
im Council for Ireland and he continued to guide its
until disabled by the illness which proved fatal

name of Bigger goes to history as that of the most
anlike and active of those who worked for the
health of Ireland His work was done in great
ties, for many of his official colleagues and
ors were not well disposed to the causes to which
ergies were devoted Nevertheless, with unfailing
ence and tact he continued to urge progressive
As an official and as official head of the
medical service, he had a full understanding of the
ties under which the poor-law medical officers
, and he was sympathetic with their endeavours
rove their conditions Indeed much of the progress
has been made in that service in the present century
ue to his encouragement

Edward Bigger, who had been a widower for many
leaves a daughter and a son, Dr J W Bigger who
the chair of bacteriology and public health and is
nt lieut-colonel in the RAMC, engaged in
logical work for the Northern Command

PIETER ROUX

M B CAPE TOWN, F R C S E, M CH ORTH LPOOL

death of Pieter Roux on April 19 is a severe loss
hopædic surgery in South Africa The calling-up
colleague Major Hamilton Bell had increased the
of an already very full life and he succumbed to a
pyæmia after three months illness in the Groote
Hospital, whose orthopædic department he had brought into being Pieter Roux was born at Paarl in 1900 and graduated in medicine at Cape University in 1923 After some experience of general practice he went to Edinburgh and took a surgical fellowship there, in 1930 he completed his orthopædic training at Liverpool and four years later took over the practice of Dr P de V Moll on his death He was not content with the well planned and equipped orthopædic unit at Groote Schuur but was about to enjoy the extra 200 beds to be added to the Princess Alice Home His mind envisaged a nation-wide organisation for the relief of the cripple He married Dr Norah McCullough who survives him with two children

A colleague now in the EMS writes Pieter Roux came from Liverpool to start orthopædic practice in Cape Town at a time when it was being recognised that fractures and much of traumatic surgery were best left in the hands of specially trained orthopædic surgeons By sheer merit, enthusiasm and dynamic energy he proved his case, and his nimble mind achieved easy progress without bruising anybody He was an ideal teacher always clear, enlivening sound principles with a quip and a jest Nor did he neglect the "old-fashioned" orthopædics and his heart went out to the cripple irrespective of colour It must have been a joy to him to have learnt shortly before his death that Cape Town University had decided to give full facilities for the training of orthopædic surgeons

---

Letters to the Editor

REACTIONS TO THE REPORT

SIR —Whatever doubts may have been felt about the constitution and procedure of the Medical Planning Commission set up by the British Medical Association, the whole profession has reason to be grateful for its draft interim report published in last week's *B M J* In a year like this it is encouraging to be reminded that progress rather than perpetual destruction is our goal, but its appearance is also timely for another and of more practical reason The public mood is one in which change is increasingly demanded for its own sake, and a day is coming when drastic reforms might easily be imposed on medical workers without their free assent The simplicities of totalitarian regimes with their obvious convenience in war, have a wide appeal, and if doctors wish to resist the establishment of a simplifying medical service they must be ready with alternative proposals on which they can broadly agree The tentative report now issued is a much more hopeful basis of agreement than any previously produced, and it puts clearly a number of questions which, as it says, are not rhetorical but must be answered

Of these the first to attract public attention is the perennial question of free choice and its implications The draft scheme as would be expected from its inspiration, is based on the family doctor, freely chosen, as the normal medical attendant and "guardian" But in future he is to work more as one of a group, and it is suggested that he should have a basic salary as well as a capitation fee related to the number of persons or families on his list Opponents of state medical service will wonder whether this compromise sufficiently preserves the traditional doctor-patient relationship To whom does the partly salaried practitioner ultimately owe allegiance—to his patient or to his employer? Is the patient's contract with an individual doctor—*my* doctor and guardian—or with a group or a service? This question of loyalties, apart from its psychological aspect, becomes acute when the patient stands to gain any considerable sum of money through his doctor's decisions, and it is arguable that free choice of medical attendant and liberty to change him cannot possibly continue when (sooner or later) more generous sick-pay becomes obtainable on the practitioner's certificate The conflict between conscience and friendship would impose too great a strain, and to avoid this the practitioner must either become a state officer or be released from the task of certification Those who set great store by the personal bond between doctor and patient may feel that the family doctor, if he is not to be paid by fees for each service, should at least be paid wholly by capitation fee, and must in any case continue to regard himself as the

German censor of medicines sent to individuals was causing delay and difficulty in the transmission of the invalid comforts parcels which contained them Medicines and vitamin concentrates are now being addressed to the medical officers of camps and hospitals with a note of the individuals for whom they are meant The medical officer can thus ensure that they are cleared by the camp censor and distributed to the right persons

Employment of Children on the Land

Mr R S HUDSON, Minister of Agriculture, informed Mr R D DENMAN that instructions had been given to county war agricultural executive committees not to encourage or facilitate the employment of children under 14 until every other source of supplementary labour had been used Committees had been asked to make every effort to see that children under 14 did not work for more than four hours a day Arrangements were to be made wherever possible for the work to be spread over such numbers of children as would enable individual children to be employed for half days only, and in term time to attend school for either the morning or afternoon session

Dispensing in the Army

Dispensers of medicines in the Army fall into three classes regular soldiers who qualified in the Army trade of dispenser before the war after not less than ten months' training in that trade, soldiers enlisted during the war who hold certain civilian qualifications, and a small number of soldiers, enlisted during the war, who trained for but had not obtained these same qualifications, but whose skill and training showed them to be up to the necessary standard, and who, having been trade tested, have been mustered as dispensers Poisons are in distinctly marked containers, and if liquid in their original containers or issued in bottles distinguishable by touch from ordinary medicine bottles They and other dangerous drugs are kept under lock and key in the custody of the dispenser or orderly officer No medicine may be administered unless it has been prescribed by a medical officer Prescriptions may be dispensed only by qualified dispensers All prescriptions containing dangerous drugs must be initialled by the dispenser and marked with the date on which they are dispensed The dispenser must file them separately and copy them into a special record kept for two years from the date of the last entry (Sir JAMES GRIGG replying to Mr A WOODBURN)

Coordination of Hospital Staffs

The Secretary of State for War has agreed in principle to the temporary loan to understaffed civilian hospitals of Army nurses who can be spared There is a standing arrangement under which Army doctors give assistance to a civil hospital in an emergency (Mr E BROWN replying to Mr R W SORENSEN)

Non-pulmonary Tuberculosis

The number of cases of non pulmonary tuberculosis notified in England and Wales during the year 1941 was 13,720 (Mr BROWN replying to Dr E SUMMERSKILL)

Quality of Milk

Dr SUMMERSKILL asked the Minister if he was satisfied with the arrangement under which the National Milk Scheme guarantee a high standard of quality in milk which had passed through a depôt, but did not protect people served by a producer retailer not in possession of a pasteurisation plant, or what further steps he proposed to take —Mr BROWN replied I welcome the increase in pasteurisation to which the arrangements in paragraph 6(f) of the white paper on milk should contribute Its further extension must be limited by considerations of what is practicable —Dr SUMMERSKILL Is the Minister aware that any producer retailer can sell milk from a tuberculous cow to an unsuspecting mother, and does he not think that the public should be afforded some protection ?—Mr BROWN We do all we can, subject to the limitations of what is practicable —Mr W LEACH Would it not be better, while being very strict about cleanliness, not to bother about the foolishness of pasteurisation ?—Mr DAVID ADAMS Will steps be taken to increase the amount of milk that is pasteurised ?—No further reply was given

Care of the Workers' Eyes

Sir ANDREW DUNCAN informed Sir F Fremantle that returns of eye injuries at Royal Ordnance Factories have not hitherto been abstracted from case records, but arrangements have now been made to do so Adequate preventive measures are taken by the provision of guards or goggles where necessary, Minor injuries are treated at the factory surgery, but where the injury is serious the employee is sent to hospital examination is a part of the normal medical factory medical officers in the Royal Ordnance F Ordinary cases are referred by the factory medical sight-testing opticians on the register of the Joint C Qualified Opticians The arrangements also provide sultations where necessary between the factory officers and ophthalmic surgeons —Sir F F Is it not desirable to make use of the regular services ophthalmic surgeons, who alone can see the really im damage that may be at the back of these injuries and cannot always be appreciated by sight testing opt A DUNCAN There are cases which it may be r refer to skilled eye surgeons, and this is done WILLIAMS Are eye testing opticians more discovering these things than eye surgeons ?—Sir MANTLE Is all possible use being made of op surgeons ?—Sir A DUNCAN We are in contact with surgeons and have made an offer to them in connexion a number of our factories

Silicosis Certificates

The number of applications for disablement certificates made by South Wales miners in 1939 was 658, of which 27 were refused, in 1940, 825, of which 396 were refused, and in 1941, 1136, of which 662 were refused (Mr O PEAKE replying to Mr NESS EDWARDS)

Day Nurseries

Mr BROWN informed Mr ELLIS SMITH that the number of day nurseries in operation at the end of May was 54 approved but not yet in operation, 576, and in an earlier stage of preparation, 216, making a total at all stages of 1332

Calcium in Flour

Mr W MABANE in answer to a question said that the maker of specialty flours, including wholemeal, are not required to add calcium to these products The matter is under consideration

Maternity Hospitals in Scotland

Of the 55 Scottish local authorities with power to provid maternity beds 42 have done so either in special maternit hospitals, of which there are twenty two with 555 beds, or general hospitals, where there are 400 maternity beds The are also in Scotland 700 maternity beds in voluntary hospital and 300 beds in ten maternity hospitals provided by t Government for evacuated expectant mothers but which practice are also used for other patients There are, therefor nearly 2000 maternity beds in the country (Mr T JOHNSTO replying to Mrs A HARDIE)

Obituary

EDWARD COEY BIGGER

KT, M D, M CH R U I

Sir Edward Coey Bigger died at his residence in co Dublin, on June 1, in his 81st year He had been pioneer in public health work in Ireland and was fo several years medical commissioner of the old Loca Government Board In 1921 he received the honour o knighthood

Born in Belfast and educated at the Queen's Colleg in that city he qualified in 1883 at the Royal Universit of Ireland For some years he practised in Belfast where he was visiting physician to the Ulster Hospita for Women and Children, and also medical officer to the Belfast Fever Hospital In 1894 he obtained the diploma in state medicine of the Conjoint Irish Royal Colleges and six years later he abandoned his practice in Belfast to become a medical inspector of the Local Government Board His interests lay probably more in the field of preventive medicine than in clinical work, and he speedily became an outstanding figure in the public service of Ireland In 1903 he was selected to be the medical member of a small vice-regal commission on Poor Law Reform in Ireland, the chairman of which was the late Mr W L Hicks Under their guidance the commission submitted in 1906 a report to which may be traced all subsequent reforms in the Irish health service In it was seen the first serious attempt to make a clear cut between the health service of the country and its poor laws The proposals of the commission were too progressive for Irish officialdom of the day, and

servant of his patient and of nobody else.' But this seems to carry the corollary that certification involving money must be entrusted to, or at least frequently reviewed by, official medical referees Is it practicable to preserve free choice by this means ?

Such are one or two of the problems raised in first reaction to the commission's observations, and it is to be hoped these will all receive the immediate attention invited One may recognise, with H G Wells, three stages in the evolution of human behaviour the first ruled by instinct, the second by tradition and precedent, and the third a stage of planned development In medicine we must now pass rapidly from the second to the third, and the present report, brilliantly conceived and executed, is a step on the way

A B

SIR,—The Medical Planning report is remarkable for its vigour and its vision If ten doctors make a success of running their health centre cooperatively, teaching as well as doctoring families in their care, if hospital medical committees and regional advisory committees shoulder the responsibility of influencing (which can mean determining) hospital and health policies, if groups of doctors throughout the scheme have scope for enterprise in their group undertakings, then some*thing new will emerge—large scale organisation that is* truly democratic The organisation of medical practice is inevitable piecemeal efforts and solo flights achieve little when it comes to applying science to human affairs In war or peace *hitherto the standard methods* of organising stupid man in the mass are bureaucracy and tyranny—both distasteful But both should be avoidable where there are intelligence and good will a combination to be expected perhaps in the medical profession We shall achieve much more in the world than the betterment of British health if we can evolve a real working professional democracy

C D

CONGENITAL SYPHILITICS OF THE LAST WAR

SIR,—Your leading article of June 6 draws attention to one aftermath of the inadequate treatment of syphilis during the last war—namely, the high proportion of late cardiovascular complications, confirmed by Aggerbeck's recent report There is another aftermath of this inadequate treatment to which I must draw attention because it affects the children of that generation of syphilitics and may have far-reaching effects During my last few years in the VD clinic at Great Ormond Street I encountered a number of young mothers—latent congenital syphilitics—whose disease had until then not been suspected, diagnosed or treated, some of them had in consequence borne congenitally syphilitic children whom they brought to the hospital for treatment On going into the family history I found that the mothers were born during the war years or shortly after, and in several of these mothers I found, when I searched for them, signs and stigmata of congenital syphilis They were in fact the offspring of men who had been inadequately treated for syphilis during the last war If medical officers of children's hospitals and practitioners in general were to keep in mind this possibility where mothers of 20–27 years of age are concerned, I venture to think they would recognise many such cases, and thus clear up the cause of a puzzling condition in the children of these mothers The signs and stigmata may be slight and only to be detected by skilled examination, but in cases of doubt the Wassermann and Kahn tests are available to help in the diagnosis

I have come across four such cases here in less than two years Three of them were soldiers who had been passed as fit for service, which they hardly were, seeing that one developed general paralysis at 21 another was undersized and intellectually deficient, while the third had well-marked rhagades, varicose veins and only one eye The fourth case raised an important question It was that of a tall, well-built girl of 18 who was working on the land and had volunteered as a blood donor To the surprise of all concerned her blood gave a positive Kahn reaction, which was confirmed later No-one would have suspected so fine and [illegible] to be a congenital syphilitic, but a careful scrutiny of her teeth supported the diagnosis The many thous[illegible] f blood donors who have been tested during the past three or more years should afford an excellent nity for ascertaining the number of positives in a section of the population, of those between the of 18 and 25 a large proportion—I predict more half—would be found on investigation to be cong rather than acquired syphilitics Moreover the m of donors of that age-group will be women, sin men are serving, and one would like to be sure th positive reactors are informed of the fact, as was don the case I have quoted, so that appropriate trea might be given Otherwise some hundreds, p thousands, of actual or potential mothers with a p serum-reaction of which they are unaware may congenitally syphilitic children, unless adequate p tive measures are taken forthwith "Congenital his," Dr Earle Moore has said, "is the disgrace of medicine," for it is preventable and we know h prevent it

Leatherhead DAVID NAB

UNDER WHICH FLAG?

SIR,—The Army Council has, I believe, propo incorporate VAD members in the ATS It is no prising that this proposal should have provoked some of consternation and no little opposition, for many who have rendered for many years excellent serv VADs may be expected to view with misgivin proposal which seeks to transfer their allegiance fr organisation which they have come to esteem so l and to love so well to a Service which has no tradi associations with nursing and which they may some regard as alien to their instincts Everyone appre the excellence of the service rendered by organis like the British Red Cross and Order of St John doubtless not least the Army authorities who hav ample opportunity of assessing their value It m that for the Army the proposed change has certain a tages to offer, it would confer greater elasticit perhaps administrative mobility and it might co ably, though not essentially, facilitate the replac RAMC personnel—nursing orderlies and the lik VADs It might open up new avenues to prom for VADs and it might possibly make available ATS a new recruiting ground for officers But it surprising to find Lady Louis Mountbatten assu Hampshire audience recently that the Red Cross S will oppose strenuously any proposal that has for it the incorporation of VADs in the ATS Apart alto from the obvious advantage of preserving as fu possible old associations of proven value, it seems to lose anything of the distinctive nursing appeal VAD movement Second thoughts may persuad Army Council that on balance things are best left a are If it is felt to be necessary to incorporate VA more distinctly military organisation it may be pref to consider the widening of the Army nursing serv include VADs as "other ranks," much in the sam as the RAMC has qualified personnel as its commis officers and partially trained auxiliaries as its other r Such a course might present administrative diffi not insurmountable by good will, it would be pref to a cleavage of natural affinities

BIOLOG

AIR-EMBOLISM

SIR,—As a sequel to Dr Keith Simpson's val article of June 13, I wish to quote two cases suffered from air-embolism and recovered after aspir of the injected air

An elderly woman was operated on by myself for an in strangulation due to a band The intestine was viabl she developed a mild degree of paralytic ileus after the tion She was somewhat dehydrated, and I decided t her an intravenous saline This was given by mean positive pressure apparatus, with a needle inserted i arm vein The flow was adjusted to 60 drops a minu visited her some hours later to change the bottle and her condition satisfactory, and as far as I could tell the would flow for a further half hour before the bottle ne changed I then went to the theatre to superinter operation by my house surgeon, having instructed the [illegible] careful watch on the apparatus and to l know when the level had reached an inch from the bott the [illegible]er I was sent for urgently a short time late was fortunately able to reach the bedside within a few mi